United States
Department of
Agriculture

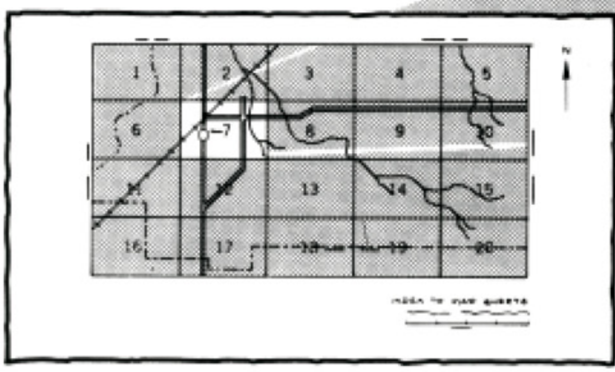
Soil
Conservation
Service

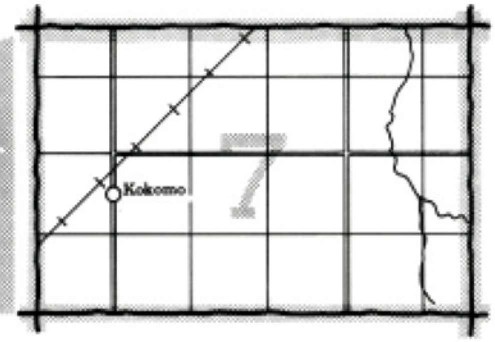
In cooperation with the University of Florida, Institute of Food and Agricultural Sciences, Agricultural Experiment Stations and Soil Science Department, and the Florida Department of Agriculture and Consumer Services

Soil Survey of Bay County Florida

HOW TO USE

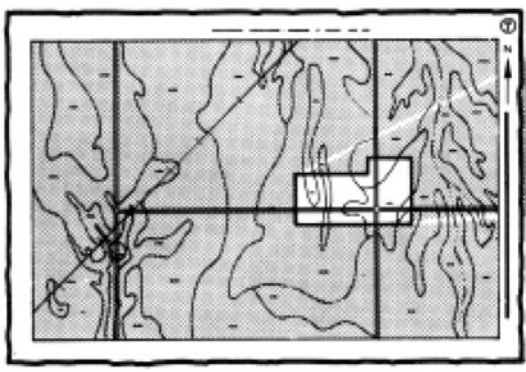
1. Locate your area of interest on the "Index to Map Sheets"

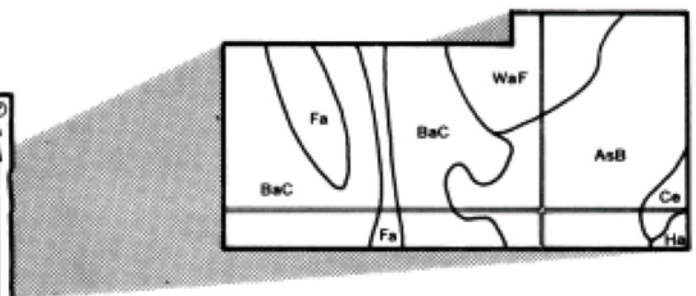




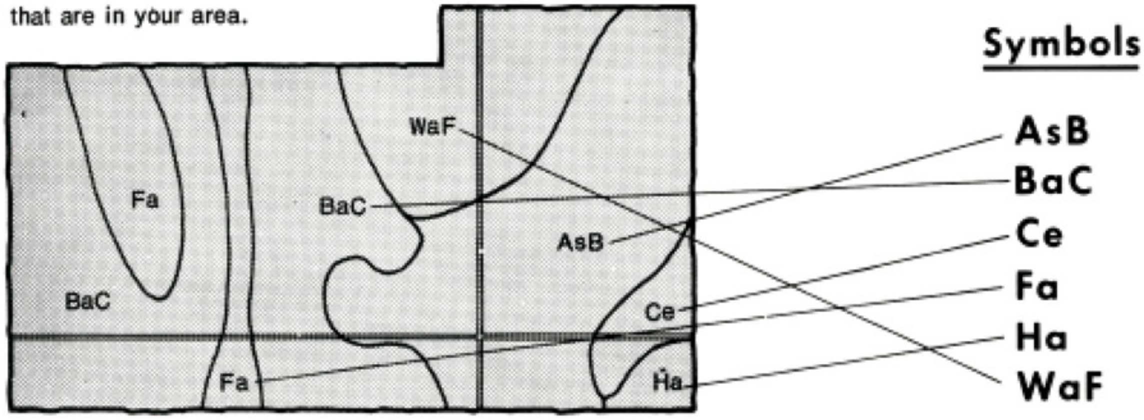
2. Note the number of the map sheet and turn to that sheet.

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



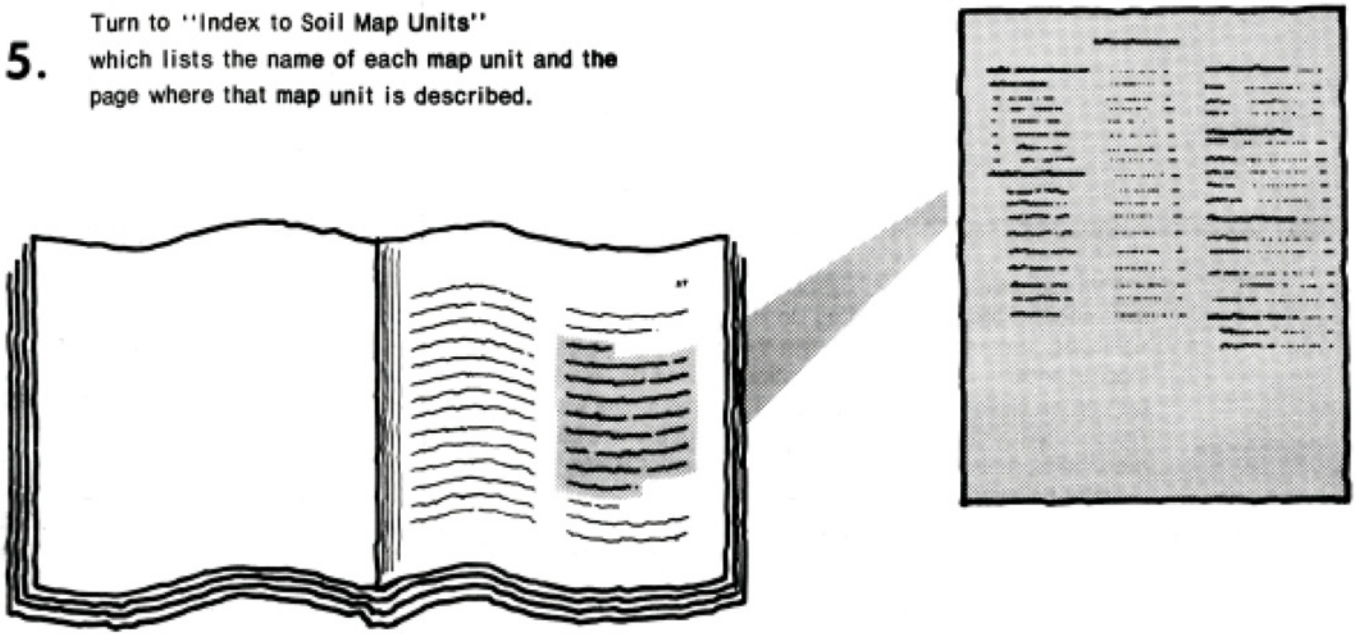


4. List the map unit symbols that are in your area.

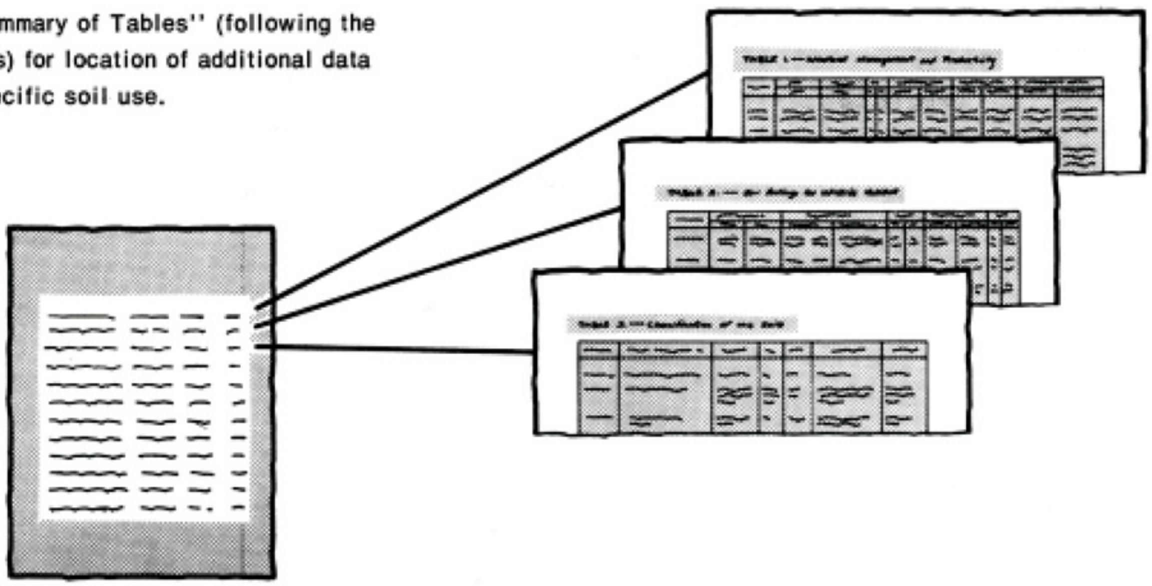


THIS SOIL SURVEY

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



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



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

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

This survey was made cooperatively by the Soil Conservation Service, the University of Florida, Institute of Food and Agricultural Sciences, Agricultural Experiment Stations and Soil Science Department, and the Florida Department of Agriculture and Consumer Services. It is part of the technical assistance furnished to the Bay County Soil and Water Conservation District. The Bay County Board of Commissioners contributed financially to the acceleration of the survey.

Major fieldwork for this soil survey was completed in 1978-81. Soil names and descriptions were approved in 1981. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1981. 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: Sea-oats are used to stabilize the Fripp and Corolla soils of Bay County's coastal dunes. (Cover photo courtesy of Florida Division of Tourism. Photo by Karl Holland.)

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Soil Series

Issued August 1984

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Summary of Tables

Foreword

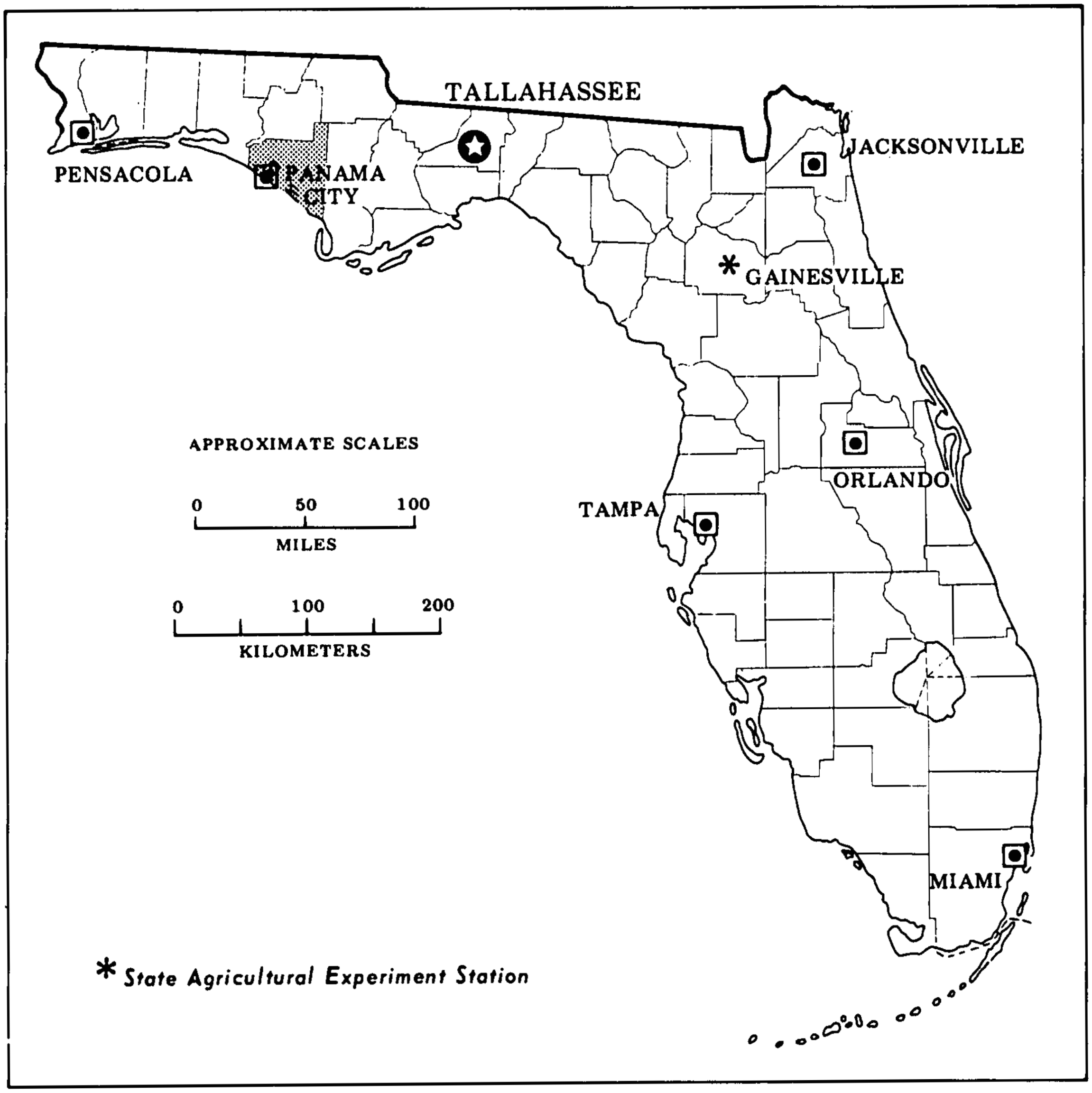
This soil survey contains information that can be used in land-planning programs in Bay County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of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

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

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

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

James Mitchell
State Conservationist
Soil Conservation Service



Location of Bay County in Florida.

Soil Survey of
Bay County, Florida

By Ernest M. Duffee, Robert A. Baldwin, Douglas L. Lewis,
and William B. Warmack, Soil Conservation Service

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

BAY COUNTY, part of the Florida Panhandle, is bordered on the north by Washington and Jackson Counties, on the east by Calhoun and Gulf Counties, on the west by Walton County, and on the south by the Gulf of Mexico.

The county comprises 481,920 acres, or 753 square miles. It is about 36 miles wide at the widest part and 44 miles long at the longest part. The population is about 100,000. Panama City, the largest town and the county seat, has a population of 45,000.

Tourism and recreation, the largest enterprises, are enhanced by the long coastline along the Gulf of Mexico, having what is termed the "world's most beautiful beaches." Forest products and related industries are also important to the economy of the county. Tyndall Air Force Base, which occupies about 28,000 acres, is very important to the economy of the county.

Recreation attracts over 1 million tourists each year from out of the county, and these tourists spend over 300 million dollars annually. Many types of recreation are available in Bay County other than those provided by the beaches. Econfina Creek provides opportunities for canoeing. Several large lakes provide opportunities for boating, fishing, water skiing, and scuba diving. Several large bays offer a variety of boating, sailing, and fishing. St. Andrews Park and several private trailer and camping areas offer camping, picnicking, hiking, swimming, and other recreational activities. Chartered boats used for saltwater (deep sea) fishing and boat rides are available at many large marinas.

About 12,000 acres, or 3 percent of the county, is cropland. About 7,500 acres, or less than 2 percent, is pasture. Federally-owned land, urban land, small and large water areas, and other land make up about 60,000 acres, or about 12 percent. The remaining 400,000 acres, or 82 percent of the county, is forest.

Soybeans is the major crop, followed by grain sorghum and corn. Forest production is by far the major use of the soil. The soil, because it is mostly sand, is a limiting factor in crop production. Present land use patterns will likely continue, with development for homes more important than crop production. Home gardens will probably increase in the rural areas.

There are many hard-surfaced roads and highways in Bay County. Bus routes north and south and east and west are available. A large airport used by commercial airlines and private planes is at Panama City. Rail freight service is available. State and federal highways provide ready access to population centers in Bay County and Florida and to other states.

General Nature of the Survey Area

The following paragraphs describe the environmental factors that affect the use and management of the soils in Bay County.

Climate

Bay County has a moderate climate. Summers are long, warm, and humid. Winters are mild to cool. The

Gulf of Mexico moderates the maximum and minimum temperatures.

Annual rainfall in the county averages about 60 inches. About 43 percent of the total occurs during the 5-month rainy season, which generally begins early in December and ends in late April. About 16 percent of the total falls in May and June. About 24 percent falls in July and August. October and November are generally the driest months.

Because the air is moist and unstable, showers are frequent and generally short. In summer, thunderstorms occur on an average of 1 day to 3 days each week. Sometimes 2 or 3 inches of rain falls within 1 or 2 hours. Rain lasting all day is rare in summer. Winter and spring rains generally are not so intense as the summer thundershowers. In 1 year in 10, more than 8 inches of rain falls in a 24-hour period. Occasionally, heavy rain and high winds accompany the passage of a tropical disturbance or hurricane. Hail falls occasionally during a thunderstorm, but it is generally small and seldom causes much damage. Snow is extremely rare.

As cold continental air flows eastward or northeastward across Bay County and the Florida Panhandle, the cold is appreciably modified. The coldest weather generally occurs on the second night after the arrival of a cold front, after heat is lost through radiation. The average date of the first killing frost is about November 29th. The average date of the last killing frost is about March 3rd. Frost has occurred, however, as early as November 5th and as late as April 10th. Freeze data for the county are shown in table 1.

Summer temperatures are mod!rated by the Gulf breeze and by cumulus clouds, which frequently shade the land without completely obscuring the sun. Mean average temperature in June, July, August, and September is about 80 degrees F. Temperatures of 90 degrees or higher have occurred in June, July, August, and September, but 100 degrees is reached only rarely. In July and August, the warmest months, the average maximum temperature is 90 degrees. Temperatures of about 95 degrees occur on fewer than 6 days. Temperature and precipitation data are shown in table 2.

Fog occurs on an average of 6 mornings a month in winter and spring and almost never occurs in summer and fall. Prevailing winds are generally from the south or southwest. In November, December, and January, they are from the northwest. The annual mean windspeed is about 7.5 miles per hour. The lowest monthly windspeed, 5.8 miles per hour, occurs in August. The highest windspeed, 9.0 miles per hour, occurs in March.

Physiography, Relief, and Drainage

Bay County lies within the Coastal Plain province. It has one predominant topographic level or one physiographic region, the terraced Coastal Lowland. This level is divided into eight terraces based on elevation above sea level (*3*). The Hazelhurst Terrace, in the extreme northeastern part of the county adjacent to Washington, Jackson, and Calhoun Counties, has an elevation of 215 to 300 feet above sea level. The Coharie Terrace, also in the extreme northeastern part of the county, has an elevation of 120 to 215 feet above sea level. The Sunderland Terrace (also called Okefenokee), in the northern part of the county adjacent to Washington and Calhoun Counties, is 100 to 170 feet above sea level. The Wicomico Terrace, across the northern part of the county, is 70 to 100 feet in elevation. The Penholoway Terrace, across the north-central part of the county, is 42 to 70 feet in elevation. The Talbot Terrace, across the central part of the county, is 25 to 42 feet in elevation. The Pamlico Terrace, across the southern part of the county, is 8 to 25 feet in elevation. The Silver Bluff Terrace, across the extreme southern part of the county, is 0 to 10 feet in elevation.

Soils of the Hazelhurst Terrace are generally sandy and excessively drained. The natural vegetation is mostly turkey oak, post oak, bluejack oak, and scattered longleaf pine. Some areas have been planted to slash pine. The Coharie Terrace has sandy soils that range from excessively drained to poorly drained. Vegetation is turkey oak, post oak, bluejack oak, scattered longleaf pine, waxmyrtle, sawpalmetto, gallberries, and wiregrass. As elevation decreases, the soils become more poorly drained. The Youngstown area is the only area where soils are loamy; the rest of the county has sandy soils.

Drainage is provided by Econfina Creek, the largest stream, and its tributaries, which include Juniper, Bear and Little Bear, Rudy, Cedar, and Moccasin Creeks. Pine Log, Burnt Mill, Bayou George, Mill Bayou, Sandy, and Calloway Creeks also contribute to Bay County drainage. Many bays, swamps, and depressions throughout the county have little natural drainage.

History and Development

Bay County was established in 1913. Settlement began before the county was established. The first settlement on record, Crevecour, was made by the French in 1717 on what is now Mexico Beach. In 1780, the British settled in a town called Wells on what is now Panama City. Wells was deserted in 1783. The first American settlements were Bay Head and Econfina, in 1819 to 1821, and Old Town (St. Andrews), in 1827. In 1898, settlers established a town named Florapolis, which became Park Resort, then Harrison, and now Panama City. Panama City has a population of around 45,000; Bay County's population is about 100,000. Fishing and forestry were the two main industries in Bay County in the early development and are important today. However, tourism and recreation are the main industries today, with forestry and forest-related industries, the military, and real estate playing important roles. At present, Bay County has one of the highest rates of population growth in Florida.

How This Survey Was Made

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

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

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

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

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

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

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

Map Unit Composition

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

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

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

General Soil Map Units

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

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

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

The soils in the survey area vary widely in their suitability and limitations for major land uses. Table 3 shows the extent of the map units shown on the general soil map. It lists the suitability or potential productivity of each, in relation to that of the other map units, for major land uses and shows soil properties that limit use.

Soil Descriptions

Soils of the sand ridges

The two map units in this group are excessively drained to somewhat poorly drained, nearly level to strongly sloping soils on uplands. Most of these soils are sandy throughout; some are sandy throughout but have a layer in which the sand grains are coated with organic material within 80 inches of the surface. One map unit is adjacent to the Gulf, and the other map unit is dominantly in the northern part of the county.

1. Kureb-Resota-Mandarin

Nearly level to gently sloping, excessively drained, moderately well drained, and somewhat poorly drained soils that are sandy to a depth of 80 inches or more; some have organic stained sandy layers

This map unit is on the sandy ridge adjacent to the Gulf. It occurs as one area about 2 miles wide or less along most of the coastline. The landscape is mainly one of nearly level to gently sloping ridges along the coastline. The natural vegetation is mostly sand pine, slash pine, longleaf pine, dwarf live oak, and turkey oak and an understory of native shrubs, sawpalmetto, rosemary, and sparse pineland threeawn (wiregrass).

This unit makes up about 16,000 acres, or 3 percent of the county. It is about 28 percent Kureb soils, 28 percent Resota soils, 28 percent Mandarin soils, and 16 percent soils of minor extent.

The Kureb soils are excessively drained. Typically, they have a surface layer of grayish brown and light gray sand about 14 inches thick. Below this is yellowish brown, brownish yellow, and very pale brown sand that extends to 80 inches or more.

The Resota soils are moderately well drained. Typically, they have a surface layer of light brownish gray and light gray fine sand about 19 inches thick. Below this is brownish yellow, yellow, very pale brown, and white fine sand that extends to a depth of 80 inches or more. A fluctuating water table is at a depth of 40 to 60 inches during rainy seasons.

The Mandarin soils are somewhat poorly drained. Typically, they have a surface layer of gray sand about 7 inches thick. Below this is a white or light gray sandy layer about 18 inches thick, then a dark brown, organic stained sandy layer 15 to 30 inches thick over light brownish gray to light gray sand that extends to a depth of 80 inches or more.

Soils of minor extent in this unit are Fripp, Leon, Rutlege, Chipley, Dorovan, Foxworth, Centenary, Hurricane, and Rutlege soils.

Large areas of this unit have been cleared and leveled and are used for urban and recreational development. The rest of the unit remains in natural vegetation.

2. Lakeland-Foxworth-Centenary

Nearly level to strongly sloping, excessively drained and moderately well drained soils that are sandy to a depth of 80 inches or more; some have organic stained sandy layers

This map unit is on uplands. It occurs as one large area about 15 miles wide and 2 to 6 miles long in the extreme northern to northeastern part of the county. The area is interspersed with large to small, steep-sided sinks, many of which are lakes or ponds. It includes Court Martial, White Western, Merial, Bream, Big Island, and Little Blue Lakes.

The landscape is mainly one of nearly level to gently sloping broad ridges and strongly sloping areas around sinks and along drainageways. There is a fairly well established stream pattern of creeks, branches, and narrow wet bottom land. The natural vegetation is mostly turkey, post, bluejack, and blackjack oak and scattered longleaf and slash pine. In some areas, slash pine is the dominant vegetation.

This unit makes up about 85,000 acres, or 18 percent of the county. It is about 40 percent Lakeland soils, 20 percent Foxworth soils, 10 percent Centenary soils, and 30 percent soils of minor extent.

The Lakeland soils are excessively drained. Typically, they have a surface layer of dark brown sand about 4 inches thick. Below this is yellowish brown and very pale brown sand that extends to 80 inches or more.

The Foxworth soils are moderately well drained. Typically, they have a surface layer of grayish brown sand about 4 inches thick. Below this is brown, yellowish brown, very pale brown, and light gray or white sand that extends to 80 inches or more. A fluctuating water table is at a depth of 40 to 72 inches for 1 month to 3 months and at a depth of 30 to 40 inches for less than 30 cumulative days annually.

The Centenary soils are moderately well drained. Typically, they have a surface layer of brown sand about 9 inches thick. Below this is brownish yellow, very pale brown, and white sand to 73 inches over a very dark, organic stained sandy layer that extends to 80 inches or more. A fluctuating water table is at a depth of 40 to 60 inches for 1 month to 4 months and at a depth of 60 to 75 inches for 4 to 8 months annually.

Soils of minor extent in this unit are Albany, Blanton, Chipley, Hurricane, Pelham, Plummer, Pottsburg, and Rutlege soils.

Large areas of this unit were cleared and planted to tung nut trees at one time; but most have been converted to slash pine forests, and some have been converted to urban development.

Soils of the low uplands and high flatwoods

The soils in this group are somewhat poorly drained and moderately well drained and nearly level to gently sloping. They are mainly on uplands. Some of these soils are loamy at a depth of 20 to 40 inches. Others are sandy to a depth of 40 inches or more and are loamy below to a depth of 80 inches or more. These soils are in the central to north-central part of the county and extend to the eastern border.

3. Leefield-Albany-Stilson

Nearly level to gently sloping, somewhat poorly drained and moderately well drained soils; some are sandy to a depth of 20 to 40 inches and are loamy below, and others are sandy to more than 40 inches and are loamy below

This map unit is on low uplands or high flatwoods. It occurs as several closely scattered areas, dominantly in the east-central part of the county. Individual areas are irregular in shape. The unit is interspersed with poorly drained and very poorly drained swamps and poorly defined drainageways. It includes the Youngstown community.

The landscape is dominantly nearly level to gently sloping. Scattered depressions, drainageways, and swamps are typical throughout most areas. The natural vegetation is mostly slash and longleaf pine; sweetgum; water, laurel, and live oak; and an understory of woody shrubs and grasses.

This map unit makes up about 45,000 acres, or 9 percent of the county. It is about 30 percent Leefield soils, 30 percent Albany soils, 10 percent Stilson soils, and 30 percent soils of minor extent.

The Leefield soils are somewhat poorly drained. Typically, the surface layer is very dark gray and dark grayish brown sand about 12 inches thick, and the subsurface layer is light yellowish brown sand about 16 inches thick. The upper part of the subsoil, to a depth of 48 inches, is light yellowish brown sandy loam and sandy clay loam mottled with brown and yellow. The lower part of the subsoil to 80 inches is dominantly light gray sandy clay loam mottled with red, yellow, and brown.

The Albany soils are somewhat poorly drained and are sandy to a depth of 40 inches or more. Typically, the surface layer is grayish brown sand about 8 inches thick, and the subsurface layer is light yellowish brown, pale brown, and light gray sand about 46 inches thick. The upper part of the subsoil is light yellowish brown sandy loam, and the lower part is very pale brown sandy clay loam mottled with light gray, brown, and yellowish red. The subsoil extends to 80 inches or more.

The Stilson soils are moderately well drained. Typically, the surface layer is dark gray sand about 7 inches thick, and the subsurface layer is light brownish gray and very pale brown loamy sand about 27 inches thick. The upper part of the subsoil extends to a depth of 58 inches and is light yellowish brown sandy loam and sandy clay loam. The lower part of the subsoil extends to a depth of 80 inches or more and is sandy clay loam reticulately mottled with shades of yellow, red, gray, and brown.

Soils of minor extent are Alapaha, Blanton, Dorovan, Centenary, Chipley, Foxworth, Hurricane, Pamlico, Pantego, Pelham, Plummer, and Rutlege soils.

Most of the acreage of this unit is wooded. Some areas have been cleared and are cultivated or are seeded to improved pasture or used for sod farming. A few small areas are planted to pecan trees and vegetables. The largest areas are planted to slash pines. Some areas have been cleared for urban development.

Soils of the flatwoods

The three map units in this group are somewhat poorly drained to very poorly drained, nearly level to gently sloping soils. Some of the soils are sandy to a depth of 20 to 40 inches and are loamy below. Some are sandy to a depth of 40 inches or more and are loamy below. Some are sandy throughout and have organic stained sandy layers within 30 inches. Some have organic stained sandy layers at a depth of more than 50 inches. These soils are scattered throughout the county.

4. Hurricane-Chipley-Albany

Nearly level to gently sloping, somewhat poorly drained soils; some are sandy throughout and others are sandy to a depth of 40 inches or more and are loamy below

This map unit is in the flatwoods. It occurs in large, scattered areas throughout the county. It is interspersed with higher lying, better drained soils and with more poorly drained soils in swamps and depressions.

The landscape is dominantly one of nearly level to gently sloping areas. Scattered swamps and depressions are typical throughout most areas. The natural vegetation is mostly slash and longleaf pine; sweetgum; water, laurel, and live oak; and an understory of native shrubs, sawpalmetto, inkberry, broomsedge, bluestem, and pineland threeawn.

This map unit makes up about 65,000 acres, or 14 percent of the county. It is about 45 percent Hurricane soils, 18 percent Chipley soils, and 17 percent Albany soils, and 20 percent soils of minor extent.

The Hurricane soils are somewhat poorly drained. Typically, the surface layer is grayish brown sand about 6 inches thick. The subsurface layers are brown, light yellowish brown, very pale brown, and light gray sand to a depth of 51 inches. Below that is a dark, organic stained sandy layer that extends to 80 inches or more.

The Chipley soils are somewhat poorly drained. Typically, the surface layer is dark gray sand about 4 inches thick. The underlying layers are grayish brown, light yellowish brown, very pale brown, light brownish gray, then light gray sand to a depth of 80 inches or more.

The Albany soils are somewhat poorly drained. Typically, the surface layer is grayish brown sand about 8 inches thick. The subsurface layer is light yellowish brown, pale brown, and light gray sand to a depth of 46 inches. The subsoil is light yellowish brown and very pale brown loamy material that extends to a depth of 80 inches or more.

Soils of minor extent are Alapaha, Blanton, Centenary, Foxworth, Leefield, Mandarin, Pamlico, Pantego, Pelham, Plummer, Pottsburg, and Rutlege soils.

Most of the acreage of this unit is wooded. A few acres have been cleared and cultivated or seeded to improved pasture. Some areas have been cleared and replanted to slash pine. A few areas have been drained, partly cleared, and used for urban development.

5. Pottsburg-Leon-Rutlege

Nearly level, poorly drained and very poorly drained soils that are sandy to a depth of 80 inches or more; some have organic stained layers

This map unit is in the low flatwoods. It occurs as large, broad areas scattered throughout the county but mostly in the western half of the county.

The landscape is dominantly one of nearly level areas with scattered swamps, depressions, and poorly defined drainageways. The natural vegetation is mostly water-tolerant species, including buckwheattree, sweetbay, blackgum, cypress, water oak, slash pine, and longleaf pine. The understory is native shrubs, pineland threeawn, inkberry, waxmyrtle, sawpalmetto, and smilax species.

This map unit makes up about 110,000 acres, or 23 percent of the county. It is about 35 percent Pottsburg soils, 30 percent Leon soils, 15 percent Rutlege soils, and 20 percent soils of minor extent.

The Pottsburg soils are poorly drained. Typically, the surface layer is dark gray sand about 5 inches thick over grayish brown and light brownish gray sand about 25 inches thick. The next layer is light gray to white sand about 30 inches thick. Below that is an organic stained sandy layer, very dark gray to black, that extends to a depth of 80 inches or more.

The Leon soils are poorly drained. Typically, the surface layer is very dark gray sand about 3 inches thick. The subsurface layer is light gray to gray sand about l2 inches thick. Below that is a dark brown to black organic stained sandy layer about 15 inches thick. Below the organic stained layer is brown to light brownish gray sand about 36 inches thick over a very dark brown organic stained layer that extends to a depth of 80 inches or more.

The Rutlege soils are very poorly drained. Typically, the surface layer is black to very dark gray sand 22 inches thick. Below is gray or light gray sand that extends to a depth of 80 inches or more.

Soils of minor extent in this unit are Alapaha, Albany, Allanton, Chipley, Dorovan, Hurricane, Mandarin, Pamlico, Pantego, Pansey, Pelham, and Plummer soils.

Most of the acreage of this unit is in cutover woodland. A few acres have been cleared and planted to improved pasture. Some areas have been cleared and planted to slash pine. Some small areas have been drained, partly cleared, and used for urban development.

6. Plummer-Pelham

Nearly level, poorly drained sandy soils; some are sandy to a depth of 40 inches or more and are loamy below, and others are sandy to a depth of 20 to 40 inches and are loamy below

This map unit is in the low flatwoods. It occurs as broad, nearly level areas dominantly in the southeastern part of the county.

The landscape is dominantly one of low, nearly level areas with numerous swamps, depressions, and poorly defined drainageways. The natural vegetation is mostly water-tolerant plants, including buckwheattree, sweetbay, blackgum, cypress, water oak, and pond pine and scattered slash and longleaf pine. The understory is pineland threeawn, waxmyrtle, and smilax species.

This map unit makes up about 25,000 acres, or 5 percent of the county. It is about 50 percent Plummer soils, 25 percent Pelham soils, and 25 percent soils of minor extent.

The Plummer soils are poorly drained. Typically, the surface layer is dark gray sand about 7 inches thick. The subsurface layer is gray to light gray sand about 41 inches thick. The upper part of the subsoil is gray sandy loam about 11 inches thick, and the lower part is gray sandy clay loam that extends to a depth of 80 inches or more.

The Pelham soils are poorly drained. Typically, the surface layer is dark gray sand about 6 inches thick. The subsurface layer is light brownish gray and light gray sand about 28 inches thick. The upper part of the subsoil is light brownish gray sandy loam about 4 inches thick, and the lower part is a light brownish gray sandy clay loam that extends to a depth of 80 inches or more.

Soils of minor extent in this unit are Alapaha, Albany, Leefield, Pantego, Pansey, Pamlico, Pickney, Pottsburg, Rains, and Rutlege soils.

Most of the acreage of this unit is in cutover woodland. A few small areas have been cleared and cultivated. A few areas have been cleared and planted to improved pasture. Some areas have been planted to slash pine. A few small areas have been drained, partly cleared, and used for urban development.

Soils of the wet depressions, flood plains, and swamps and marshes

The two map units in this group are mostly very poorly drained, nearly level or depressional soils. Some have a thick mineral surface layer high in organic matter content. Some have an organic surface layer from 20 to 50 inches thick. Some have an organic surface layer more than 50 inches thick. These soils occur throughout the county as areas ranging from small to very large.

7. Pamlico-Rutlege-Dorovan

Nearly level, very poorly drained soils; some have an organic surface layer 20 inches to more than 50 inches thick, and others are sandy throughout

This map unit is in swamps and depressions and in drainageways that range from narrow to very broad. The natural vegetation is mostly water-tolerant plants, including buckwheattree, sweetbay, cypress, blackgum, water oak, and pond pine. A few scattered longleaf and slash pines grow in some areas. The understory consists of water-tolerant native shrubs, including waxmyrtle, sea myrtle, sawpalmetto, smilax species, and pineland threeawn.

This map unit makes up about 80,000 acres, or 17 percent of the county. It is about 32 percent Pamlico soils, 25 percent Rutlege soils, 15 percent Dorovan soils, and 28 percent soils of minor extent.

The Pamlico soils are very poorly drained. Typically, the surface layer is black organic material more than 20 inches thick. Below that is dark grayish brown to light gray sand to a depth of 80 inches or more.

The Rutlege soils are very poorly drained. Typically, the surface layer is very dark gray or black sand 22 inches thick. Below this is gray or light gray sand that extends to a depth of 80 inches or more.

The Dorovan soils are very poorly drained. Typically, the surface layer is organic material 60 inches thick. Below this is dark gray to light gray sand that extends to a depth of 80 inches or more.

Soils of minor extent in this unit are Alapaha, Albany, Allanton, Pansey, Pantego, Pelham, Pickney, Plummer, and Pottsburg soils.

Most of the acreage of this unit remains in woodland, some of which has had some trees cut for market. A few small areas have been drained and partly cleared for urban development.

8. Rutlege-Allanton-Pickney

Nearly level or depressional, very poorly drained or poorly drained soils that are sandy to a depth of 80 inches or more; some have organic stained layers

This map unit occurs as broad, very low, nearly level areas or in large depressional areas and some poorly defined drainageways throughout the county. The natural vegetation is water-tolerant plants, including sweetbay, blackgum, water oak, cypress, buckwheattree, and pond pine. The understory is native shrubs, including waxmyrtle, sawpalmetto, gallberry, inkberry, pineland threeawn, and smilax species.

This map unit makes up about 45,000 acres, or 9 percent of the county. It is about 35 percent Rutlege soils, 25 percent Allanton soils, 10 percent Pickney soils, and 30 percent soils of minor extent.

The Rutlege soils are very poorly drained. Typically, the surface layer is very dark gray or black sand 22 inches thick. Below that, gray to light gray sand extends to a depth of 80 inches or more.

The Allanton soils are poorly drained. Typically, the surface layer is black to very dark gray sand 18 inches thick. The subsurface layer is dark gray and light gray sand to a depth of 52 inches. It is underlain by a very dark gray to black organic stained sandy layer that extends to a depth of 80 inches or more.

The Pickney soils are very poorly drained. Typically, the surface layer is black sand to a depth of 30 inches.

The subsurface layer is dark gray sand about 16 inches thick. Below that is gray sand that extends to a depth of 80 inches or more.

Soils of minor extent in this unit are Alapaha, Albany, Pamlico, Pantego, Pelham, Plummer, and Pottsburg soils.

Most of the acreage of this unit is in cutover woodland. A few small areas have been cleared and planted in improved pasture. A few small areas have been drained, partly cleared, and used for urban development.

Soils of the tidal marshes

The soils in the group are in very poorly drained tidal marshes subject to daily flooding with saltwater. Some of the soils have a thick organic surface layer over sand, and some have a sandy surface layer moderately high in organic matter content. These soils are along the bayshore along the southern coastline and extend northward in sloughlike areas joining drainageways of streams draining into the large bays.

9. Bayvi-Dirego

Nearly level, very poorly drained soils; some are sandy to a depth of 80 inches or more, and others are organic to a depth of 14 to 50 inches and are sandy below

This map unit consists of saltwater marshes adjacent to the large bays in the southern part of the county. The natural vegetation is salt-tolerant needle reeds and cordgrasses. Most areas of this unit are in native vegetation and are not suited to any use other than as wildlife habitat.

This map unit makes up about 11,000 acres, or 2 percent of the county. It is about 79 percent Bayvi soils and 21 percent Dirego soils. The unit is unique in the survey area in that it is made up entirely of the two major soils and does not include any minor soils.

The Bayvi soils are very poorly drained and are subject to tidal flooding daily. Typically, the surface layer is very dark gray loamy sand about 8 inches thick. The next layer is very dark gray sand about 20 inches thick. Below that is dark gray to gray loamy sand about 37 inches thick over gray sand that extends to a depth of 80 inches or more.

The Dirego soils are very poorly drained and are subject to tidal flooding daily. Typically, the surface layer is dark reddish brown to black organic matter 28 inches thick. Below that is stratified very dark brown, dark gray, and gray loamy sand and sandy material to a depth of 80 inches or more.

All of the areas of this unit are in natural vegetation.

Detailed Soil Map Units

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

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

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

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

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Lakeland sand, 0 to 5 percent slopes, is one of several phases in the Lakeland series.

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

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. The Pamlico-Dorovan complex is an example.

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

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

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

Soil Descriptions

1—Albany sand, 0 to 2 percent slopes. This somewhat poorly drained, nearly level sandy soil occurs along defined drainageways and on areas leading to lower wet areas. Slopes are smooth.

Typically, the surface layer is grayish brown sand about 8 inches thick. The subsurface layer is sand to a depth of about 54 inches. The upper 16 inches is light yellowish brown, the next 22 inches is pale brown, and the lower 8 inches is light gray with pale brown mottles. The upper 6 inches of the subsoil is light yellowish brown sandy loam with mottles of gray, brown, and yellow. The lower 20 inches is very pale brown sandy clay loam mottled with yellow, gray, and brown.

Included with this soil in mapping are small areas of Blanton, Bonifay, Chipley, Foxworth, Hurricane, Lakeland, Leefield, and Stilson soils. Also included are small areas of soils that have properties similar to those of the Albany soil except that they have a thick, dark surface layer. Also included in a few mapped areas are soils that have similar properties in the upper 60 inches but that have a dark layer within a depth of 80 inches. A few small areas of soils that are similar to the Albany soil but are better drained and a few small areas of soils that are similar except that they have 2 to 5 percent slopes are also included. Included soils make up less than 15 percent of any mapped area.

This Albany soil has a water table at a depth of 18 to 30 inches for 1 month to 3 months during most years. Available water capacity is very low in the surface and subsurface layers and is medium in the subsoil. Permeability is rapid in the surface layer, moderately rapid in the subsurface layer, and moderate in the subsoil. Natural fertility is low. The organic matter content is generally medium, but in a few small areas it is moderately high.

The natural vegetation is longleaf and slash pine and some hardwoods, mostly blackjack, post, and blue oak. The understory is gallberry, waxmyrtle, and pineland threeawn.

Wetness is a severe limitation for cultivated crops. Without good water control, this soil is poorly suited to most cultivated crops. When properly managed, it is moderately suited to most crops commonly grown in the area. Intensive water-control measures are needed. Drains are needed to intercept hillside seepage water. Soil-improving cover crops and all crop residue should be left on the land. Drainage and bedding are needed for crops that are damaged by wetness.

This soil is moderately well suited to pasture and hay crops. Coastal bermudagrass and bahiagrasses respond moderately well to fertilizer and lime. Controlled grazing is needed to maintain vigorous plants for maximum yields and a good ground cover.

Under high-level management, this soil has high potential productivity for loblolly and slash pine. Equipment limitations, seedling mortality, and plant competition are the main management problems.

Soil limitations that affect septic tank absorption fields are severe; limitations that affect local roads and streets are moderate. Water control is necessary for these uses. Use of this soil as sites for dwellings without basements and for playgrounds is severely limited. Water control, mounding, or filling or a combination of these measures is required if the soil is used as a site for dwellings or playgrounds. Even if a complex system that includes all these measures is installed, limitations are severe for trench sanitary landfills.

This soil is in capability subclass IIIw.

2—Albany sand, 2 to 5 percent slopes. This somewhat poorly drained, gently sloping sandy soil occurs along defined drainageways and on gentle slopes adjacent to lower lying wet areas. Slopes are smooth.

Typically, the surface layer is grayish brown sand about 7 inches thick. The subsurface layer is sand to a depth of about 48 inches. The upper 19 inches is pale brown, and the next 22 inches is pale brown mottled with gray and brown. The upper 12 inches of the subsoil is light yellowish brown sandy loam with mottles of gray, brown, and yellow. The lower 20 inches is light gray sandy clay loam mottled with yellow and brown.

Included with this soil in mapping are small areas of Blanton, Bonifay, Chipley, Foxworth, Lakeland, Leefield, and Stilson soils. Also included are small areas of soils that are similar to this Albany soil except that they have a thicker, darker surface layer. Also included in a few areas are soils that are similar in the upper 60 inches but have a layer of humus within a depth of 80 inches. Also included are a few small areas of similar soils that have slopes of less than 2 percent. Included soils make up less than 15 percent of any mapped area.

This Albany soil has a water table at a depth of 18 to 36 inches for 1 month to 3 months during most years. Available water capacity is very low in the surface and subsurface layers and is medium in the subsoil. Permeability is rapid in the surface layer, moderately rapid in the subsurface layer, and moderate in the subsoil. Natural fertility is low. Organic matter content is generally medium in the surface layer and low in the subsurface layer.

The natural vegetation consists of longleaf and slash pine and some hardwoods, including blackjack, post, and blue oak. The understory consists of gallberry, southern inkberry, waxmyrtle, and pineland threeawn.

Wetness and the sand content are severe limitations for crop production. The potential for crop production is low. Without good water control, this soil is poorly suited to most crops. With good water control and good management, it is moderately suited to adapted crops of this area. Intensive water-control measures are needed. Drains are needed to intercept hillside seepage water. Soil-improving cover crops are recommended, and all crop residue should be left on the land or plowed under. Drainage and bedding are recommended for those crops that are subject to damage by wetness.

This soil is moderately well suited to pasture and hay crops. Coastal bermudagrass and bahiagrass are moderately well adapted. The soil responds moderately to fertilizers and lime. Controlled grazing is needed to maintain vigorous plants for maximum yields and a good ground cover.

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

Use of this soil as septic tank absorption fields is severely limited. Use as sites for local roads and streets is moderately limited. Water control is necessary for these uses. Use of this soil as sites for dwellings without basements and playgrounds is severely limited. Water control, mounding, or filling or a combination of these measures is required if the soil is used as building sites or playgrounds. Even if a complex system that includes all the above measures is installed, limitations are severe for trench sanitary landfills.

This soil is in capability subclass IIIe.

3—Blanton fine sand, 0 to 5 percent slopes. This moderately well drained, nearly level to gently sloping soil occurs on uplands throughout the county but is predominantly in the northeastern and eastern parts. Slopes are smooth to convex.

Typically, the surface layer is grayish brown fine sand about 4 inches thick. The subsurface layer is fine sand to a depth of about 60 inches. The upper 16 inches is pale brown, the next 27 inches is light yellowish brown with few to common uncoated sand grains, and the lower 13 inches is yellow with many uncoated sand grains. The subsoil extends to a depth of 80 inches or more. The upper 3 inches is yellowish fine sandy loam. The lower part of the subsoil is brownish yellow fine sandy loam mottled with gray and brown.

Included with this soil in mapping are small areas of Albany, Bonifay, Foxworth, Lakeland, and Troup soils. Also included are small areas of soils that are similar to the Blanton soil but have lumps or streaks of sandy clay or clay in the lower part of the subsoil and a few small areas of soils that are similar to the Blanton soil but are well drained. Included soils make up less than 15 percent of any one mapped area.

This Blanton soil has a perched water table above the subsoil for less than 1 month during most years. Available water capacity is low in the surface and subsurface layers and is medium in the subsoil. Permeability is rapid in the surface and subsurface layers and is moderately rapid in the subsoil. Natural fertility and organic matter content are low throughout.

The natural vegetation consists of slash and longleaf pine; live, post, and red oak; dogwood; and an understory of native shrubs, huckleberry, and pineland threeawn. Most areas are cutover woodland or have been cleared for crops or improved bahiagrass pastures.

Use of this soil for most cultivated crops is severely limited. Droughtiness and rapid leaching of plant nutrients greatly limit the choice of plants and reduce potential yields of adapted crops. Row crops should be planted on the contour in strips alternating with strips of close-growing crops. Crop rotations should include close-growing cover crops, and all crop residues should be left on the ground for cover. Irrigation of high-value crops is generally feasible where water is readily available.

This soil is moderately well suited to pasture and hay crops. Deep-rooted Coastal bermudagrass and the improved bahiagrasses are well adapted, but yields are reduced by periodic droughts. Regular fertilizing and liming are needed. Grazing should be controlled to maintain plant vigor and a good ground cover.

This soil has moderately high potential productivity for longleaf and slash pine. Equipment limitations and seedling mortality are the major management concerns.

Soil limitations that affect use of this soil as a site for dwellings without basements, small commercial buildings, and local roads and streets are slight. Use as septic tank absorption fields is moderately limited. Use as a site for recreational development is severely limited. Surface stabilization is needed if the soil is used as a site for this activity. Use as a site for shallow excavations and trench sanitary landfills is severely limited. If shallow excavations are made in this soil, shoring of sidewalls is necessary. Suitable fill must be used as a sealer and daily cover if the soil is used as a trench sanitary landfill.

This soil is in capability subclass IIIs.

4—Blanton fine sand, 5 to 8 percent slopes. This moderately well drained, deep, sloping soil is mostly in the northern part of the county on slopes adjacent to depressions and well-defined drainageways. Slopes are smooth to convex.

Typically, the surface layer is grayish brown fine sand about 4 inches thick. The subsurface layer is fine sand to a depth of about 58 inches. The upper 16 inches is pale brown, the next 26 inches is light yellowish brown with few to common uncoated sand grains, and the next 12 inches is yellow with many uncoated sand grains. The subsoil extends to a depth of 80 inches or more. The upper 3 inches is yellowish brown fine sandy loam. The lower part is brownish yellow fine sandy loam mottled in shades of yellow, brown, and gray.

Included with this soil in mapping are small areas of Albany, Bonifay, Chipley, Foxworth, Lakeland, Stilson, and Troup soils. Also included are small areas of soils that are similar to this Blanton soil but have lumps or streaks of sandy clay in the lower part of the subsoil and a few areas of soils that are similar to the Blanton soils but have slopes of 0 to 5 percent or 8 to 12 percent. A few small areas with plinthite are also included. Included soils make up less than 15 percent of any mapped area.

This Blanton soil has a perched water table above the subsoil for less than 1 month during most years. Available water capacity is low in the surface and subsurface layers and is medium in the subsoil. Permeability is rapid in the surface and subsurface layers and is moderate in the subsoil. Natural fertility and organic matter content are low throughout.

The natural vegetation is slash and longleaf pine; live, post, and red oak; huckleberry; dogwood; and an understory of native shrubs and pineland threeawn. Most areas are cutover woodland or have been cleared and planted to bahiagrass improved pasture.

This soil has very severe limitations for most cultivated crops. Droughtiness, rapid leaching of plant nutrients, and slope greatly limit the choice of plants and reduce potential yields of adapted crops. Row crops should be planted on the contour in strips alternating with strips of close-growing crops. Crop rotations should include close-growing cover crops at least three-fourths of the time. Soil-improving crops and all crop residues should be left on the surface. These soils are too steep to be effectively irrigated.

This soil is moderately suited to pasture and hay crops. Deep-rooted Coastal bermudagrass and improved bahiagrass are well adapted, but yields are reduced by periodic droughts. Regular fertilizing and liming are needed. Grazing should be controlled to maintain plant vigor and a good ground cover.

This soil has moderately high potential productivity for longleaf and slash pine. Equipment limitations and seedling mortality are the major management concerns.

Soil limitations that affect dwellings without basements and local roads and streets are slight. Use of the soil as septic tank absorption fields and as a site for small commercial buildings is moderately limited. Limitations that affect recreational uses are severe; surface stabilization is needed for these activities. Use of this soil as a site for shallow excavations and trench type sanitary landfills is severely limited. If shallow excavations are made in this soil, shoring of sidewalls is necessary. Suitable fill must be used as a sealer and daily cover if the soil is used as a trench sanitary landfill.

This soil is in capability subclass IVs.

5—Bonifay sand, 0 to 5 percent slopes. This well drained, nearly level to gently sloping soil occurs on narrow to moderately broad ridges on the uplands. Areas of this soil are generally surrounded by long, steeper slopes that extend from the ridges to narrow streambeds or natural drainageways. Slopes are smooth to convex.

Typically, the surface layer is brown sand about 7 inches thick. The subsurface layer is sand and extends to a depth of about 54 inches. The upper 27 inches is light yellowish brown, and the lower 20 inches is very pale brown with mottles in shades of yellow and brown. The subsoil extends to a depth of 80 inches or more. The upper 4 inches is light yellowish brown sandy loam. The next 6 inches is light yellowish brown sandy clay loam mottled in shades of yellow, brown, red, and gray. The lower 16 inches is light yellowish brown sandy clay loam mottled in shades of yellow, brown, gray, and red. Plinthite occurs within 60 inches of the surface and makes up from 5 to 25 percent of the layer.

Included with this soil in mapping are small areas of Albany, Blanton, Foxworth, Lakeland, Stilson, and Troup soils. Also included are a few small areas of soils that are similar to this Bonifay sand except that they have ironstone pebbles or thin layers of ironstone and a few small areas of soils that are similar except that depth to plinthite is more than 60 inches. Also included are a few small areas of soils that are similar to the Bonifay soil but have 5 to 8 percent slopes. Included soils make up less than 15 percent of any mapped area.

Depth to the water table is more than 72 inches except that a perched water table is above the subsoil for 1 to 5 days after heavy rainfall. Available water capacity is low in the surface and subsurface layers and is medium in the subsoil. Permeability is rapid in the surface and subsurface layers and is moderate to moderately slow in the subsoil. Natural fertility and organic matter content are low throughout this soil.

The natural vegetation is longleaf and slash pine and a mixture of hardwoods, including blackjack, live, turkey, and post oak and persimmon trees. The understory is huckleberry, native shrubs, and moderately sparse pineland threeawn.

Use of this soil for cultivated crops is severely limited. Droughtiness and rapid leaching of plant nutrients limit the choice of plants and reduce potential yields of adapted crops. If this soil is used for row crops, the row crops should be planted on the contour in alternating strips with close-growing, soil-improving crops. Crop rotations should include close-growing, soil-improving crops at least two-thirds of the time. The soil-improving crops and the residues of all other crops should be left on the land. All crops should be limed and fertilized. Irrigation of high-value crops that are adapted to the soil is usually feasible where irrigation water is readily available.

This soil is moderately suited to improved pastures. Deep rooted plants such as Coastal bermudagrass and improved bahiagrass are well adapted. They grow well and produce good ground cover when they are limed and fertilized. Controlled grazing is needed to maintain vigorous plants for maximum yields. Yields are occasionally greatly reduced by extended severe droughts.

This soil has moderately high potential productivity for slash and longleaf pine. Low available water capacity, low natural fertility, and rapid permeability in the root zone limit growth.

Soil limitations that affect use of this soil as a site for dwellings without basements, small commercial buildings, and local roads and streets are slight. Wetness is a moderate limitation to use of this soil as sites for dwellings with basements. Use as sites for recreational development is severely limited. Surface stabilization is needed if the soil is used for recreational developments. Use of this soil as sites for shallow excavations and trench sanitary landfills is severely limited. Sidewalls must be shored if excavations are made in this soil. Suitable material must be used as a sealer and as daily cover for trench sanitary landfills.

This soil is in capability subclass IIIs.

6—Bonifay sand, 5 to 8 percent slopes. This well drained, sloping soil occurs on side slopes adjacent to narrow streambeds or drainageways. Slopes are generally smooth.

Typically, the surface layer is brown sand about 4 inches thick. The subsurface layer is sand about 44 inches thick. The upper 30 inches is yellowish brown, and the lower 14 inches is pale brown with many uncoated sand grains. The subsoil extends to a depth of 80 inches or more. The upper 6 inches is light yellowish brown sandy loam mottled with yellowish brown and yellowish red. The next 8 inches is light yellowish brown sandy clay loam mottled with yellowish brown, strong brown, yellowish red, and light gray. The lower 18 inches is pale brown sandy clay loam mottled in shades of yellow, brown, gray, and red. The content of plinthite in the subsoil ranges from 5 to 25 percent.

Included with this soil in mapping are small areas of Albany, Blanton, Foxworth, Lakeland, Stilson, and Troup soils. Also included are small areas of soils that are similar to this Bonifay soil but are more than 25 percent plinthite in the subsoil. In some areas, very compact, almost rocklike, firm or cemented indurated layers of plinthite occur. Also included are small areas of soils that are similar to this Bonifay soil but have slopes of 0 to 5 percent or 8 to 12 percent. In a few small areas, depth to plinthite is more than 60 inches. Included soils make up less than 15 percent of any mapped area.

Depth to the water table is more than 72 inches except that a perched water table is above the subsoil for 1 day to 5 days after heavy rains. Seepage at the base of slopes is common after rains. Available water capacity is low in the surface and subsurface layers and is medium in the subsoil. Permeability is rapid in the surface and subsurface layers and is moderate to moderately slow in the subsoil. Natural fertility and organic matter content are low throughout this soil.

The natural vegetation is slash and longleaf pine and a mixture of hardwoods, including blackjack, turkey, live, and post oak and persimmon. The understory is huckleberry, native shrubs, smilax, and moderately sparse pineland threeawn.

This soil has very severe limitations for cultivated crops. Droughtiness, rapid leaching of plant nutrients, and slopes limit the choice of plants and reduce potential yields of adapted crops. If this soil is used for row crops, row crops should be planted on the contour in alternating strips with close-growing, soil-improving crops. Crop rotations should include close-growing, soil-improving crops at least three-fourths of the time. The soil-improving crops and the residues of all other crops should be left on the land. All crops should be limed and fertilized.

This soil is moderately suited to improved pasture. Deep-rooted plants such as Coastal bermudagrass and improved bahiagrass are well adapted. They grow well and produce good ground cover when they are limed and fertilized. Controlled grazing is needed to maintain vigorous plants for maximum yields. Yields are occasionally greatly reduced by extended severe droughts.

This soil has moderately high potential productivity for slash and longleaf pine and for sweetgum and sycamore. Low available water capacity, low natural fertility, and rapid permeability limit growth.

Soil limitations that affect dwellings without basements and local roads and streets are slight. Wetness is a moderate limitation to use of this soil as sites for dwellings with basements. Use as sites for shallow excavations, trench sanitary landfills, and recreational uses is severely limited. Measures needed if shallow excavations are made in this soil include shoring of sidewalls. The sandy overburden must be removed and suitable material added as a sealer and as daily cover if this soil is used as the site for a trench sanitary landfill. Surface stabilization is needed to use this soil as a site for recreational developments.

This soil is in capability subclass IVs.

9—Lakeland sand, 0 to 5 percent slopes. This excessively drained, nearly level to gently sloping soil occurs on broad upland areas in the northern part of the county. Slopes are smooth and generally convex.

Typically, the surface layer is dark brown sand about 4 inches thick. Below the surface layer is yellowish brown sand and then very pale brown sand to a depth of 80 inches or more.

Included with this soil in mapping are small areas of Albany, Blanton, Bonifay, Chipley, Foxworth, and Troup soils. Also included in a few areas are soils that are similar to this Lakeland soil in the upper 66 inches but have a dark layer within a depth of 80 inches. Also included are small areas of soils that are similar to this Lakeland soil but have slopes of 5 to 8 percent. Included soils make up less than 15 percent of any mapped area.

This Lakeland soil has low available water capacity throughout. Permeability is very rapid throughout. Natural fertility and organic matter content are low. Depth to the water table is more than 80 inches throughout the year.

The natural vegetation is longleaf and slash pine and blackjack, bluejack, turkey, and post oak. The understory consists of smilax, blackberry, yaupon, dwarf live oak, running oak, huckleberry, milkweed, ragweed, mayweed, dogfennel, and sparse pineland threeawn. Most areas of this soil are owned by paper companies and are planted to slash pine and sand pine.

The sandy texture very severely limits use of this soil for cultivated crops. Intensive soil management practices are required where this soil is cultivated. Droughtiness and rapid leaching of plant nutrients reduce the variety and potential yields of adapted crops. If this soil is used for row crops, the row crops should be planted on the contour in strips alternating with strips of close-growing crops. The soil-improving crops and the residue of all crops should be left on the land. Crops should be irrigated where water is readily available.

This soil is moderately suited to pasture and hay crops. Deep-rooted plants such as bahiagrasses and Coastal bermudagrass are well adapted, but yields are reduced by periodic droughts. Regular fertilizing and liming are needed. For maximum yields, grazing should be controlled to permit plants to maintain vigor.

This soil has moderately high potential productivity for pine trees. Equipment limitations and seedling mortality are the main management concerns. Slash pines are the best species to plant.

Soil limitations that affect use of this soil as sites for most urban development are slight. Use of this soil for recreational development is severely limited. The sandy texture, which causes cutbanks to cave, limits use as a site for shallow excavations and for most recreational development. Shoring and surface stabilization help to offset the limitation. Soil limitations that affect septic tank absorption fields and footings and foundations for buildings are slight. This soil is too sandy to be used as a site for either trench or area sanitary landfills. It is poorly suited to use as daily cover for landfills.

This soil is in capability subclass IVs.

10—Lakeland sand, 5 to 8 percent slopes. This excessively drained, sloping soil is on upland side slopes adjacent to well-defined drainageways, dominantly in the northern part of the county. Slopes are smooth and convex.

Typically, the surface layer is dark brown sand about 4 inches thick. The underlying layer is sand to a depth of 80 inches or more. The upper 33 inches is brownish yellow, and the lower part is pale brown.

Included with this soil in mapping are small areas of Albany, Blanton, Bonifay, Chipley, Foxworth, and Troup soils. Also included in a few areas are soils that are similar to this Lakeland soil in the upper 60 inches but have a dark layer within a depth of 80 inches. Also included are small areas of soils that are similar to the Lakeland soil but have slopes of 0 to 5 percent, and a few areas where slopes are 8 to 12 percent. Included soils make up less than 15 percent of any mapped area.

This Lakeland soil has low available water capacity throughout. Permeability is very rapid. Natural fertility and organic matter content are low. Depth to the water table is more than 80 inches.

The natural vegetation consists of longleaf and slash pine and blackjack, bluejack, turkey, and post oak. The understory consists of smilax, blackberry, yaupon, dwarf live oak, running oak, huckleberry, milkweed, ragweed, mayweed, cornflower, dogfennel, cudweed, and sparse pineland threeawn. Many areas have been planted to pine trees.

This soil is not suited to cultivated crops because of droughtiness, low natural fertility, steepness of slope, and susceptibility to erosion.

This soil is moderately suited to pasture. Deep-rooted plants such as Coastal bermudagrass and bahiagrass are well adapted, but yields are reduced by periodic droughts. Regular fertilizing and liming are needed. For maximum yields, grazing should be controlled to permit plants to maintain vigor.

These soils have moderately high potential productivity for pine trees. Equipment limitations and seedling mortality are the main management concerns. Slash pines are the best species to plant.

Soil limitations that affect use as sites for most urban development are slight. Use of the soil as sites for recreational uses is severely limited. Surface stabilization is necessary where the soil is developed for recreational uses. The sandy texture, which causes cutbanks to cave, limits use for shallow excavations. Shoring helps to offset this limitation. Soil limitations that affect use of the soil as sites for both area and trench sanitary landfills are severe. The soil is poorly suited to use as daily cover for landfills.

This soil is in capability subclass VIs.

11—Lakeland sand, 8 to 12 percent slopes. This excessively drained, strongly sloping soil occurs on upland hillsides in the northern part of the county. Slopes are smooth, irregular, and convex.

Typically, the surface layer is dark brown or dark grayish brown sand 3 to 4 inches thick. The underlying layer is sand extending to a depth of 80 inches or more. The upper 38 inches is brownish yellow and overlies pale brown or very pale brown sand.

Included with this soil in mapping are small areas of Albany, Blanton, Bonifay, Foxworth, and Troup soils. Also included are small areas of soils that occur at the bases of the steeper slopes and have a mixed sandy clay loam and sandy clay subsoil at varying depths. Also included are soils that are similar to this Lakeland soil but have slopes of 5 to 8 percent and a few areas where slopes are 12 to 30 percent. The steeper slopes are generally narrow escarpments adjacent to drainageways and low-lying wet depressional areas. Included soils make up less than 20 percent of any mapped area.

This Lakeland soil has low available water capacity, low natural fertility, and low organic matter content throughout. Permeability is very rapid.

The natural vegetation consists of longleaf and slash pine and blackjack, bluejack, turkey, and post oak. The understory consists of smilax, blackberry, yaupon, dwarf live oak, running oak, huckleberry, milkweed, ragweed, mayweed, cornflower, dogfennel, cudweed, and sparse pineland threeawn. Large areas of this soil have been planted to slash pine and sand pine.

This soil is not suitable for cultivated crops because of droughtiness, low natural fertility, steepness of slope, and susceptibility to erosion.

This soil is moderately suited to pasture. Deep-rooted plants such as Coastal bermudagrass and bahiagrass are well adapted, but yields are reduced by periodic droughts. Regular fertilizing and liming are needed. For maximum yields, grazing should be controlled to permit plants to maintain vigor.

This soil has moderately high potential productivity for pine trees. Equipment limitations and seedling mortality are management concerns. Slash pines are the best species to plant.

Steep slopes are a moderate limitation to use of this soil as sites for most urban uses and a severe limitation to use for recreational development. Septic tank absorption fields function best if laid out on the contour or parallel to the slope rather than up and down the slope. The sandy texture and the hazard of cutbanks caving limit use as sites for shallow excavations and recreational development. Shoring and surface stabilization help to offset these limitations.

This soil is in capability subclass VIs.

12—Leefield sand. This somewhat poorly drained, nearly level soil is in wet areas along drainageways in the flatwoods. Slopes are smooth to convex and range from 0 to 2 percent.

Typically, the surface layer is very dark gray sand about 6 inches thick. The upper 6 inches of the subsurface layer is dark grayish brown sand, and the lower 16 inches is light yellowish brown sand mottled with gray, brown, and yellow. The subsoil extends to a depth of 80 inches or more. The upper 8 inches is light yellowish brown sandy loam with mottles of gray, brown, yellow, and red. The next 12 inches is light yellowish brown sandy clay loam with mottles of gray, brown, yellow, and red. The lower 32 inches is sandy clay loam reticulately mottled with gray, yellow, brown, and red. This subsoil contains plinthite.

Included with this soil in mapping are small areas of Albany, Alapaha, Chipley, Foxworth, Pelham, and Stilson soils. Also included are small areas of soils that are similar to this Leefield soil but are less than 5 percent plinthite. Also included are small areas of soils that are similar to the Leefield soil to a depth of about 48 inches but have sandy clay or clay below 48 inches and a few small areas of similar soils that have slopes of 2 to 5 percent. Small areas of more poorly drained soils are included in some areas. Also included are a few small areas of soils that are similar but have a thicker, very dark gray or black surface layer. Included soils make up less than 15 percent of any mapped area.

This Leefield soil has a perched water table at a depth of 18 to 30 inches for about 3 to 4 months during most years. Available water capacity is low in the surface and subsurface layers and is medium in the subsoil. Permeability is rapid in the surface and subsurface layers and is moderately slow in the subsoil. Natural fertility and organic matter content are moderate to a depth of about 10 inches and are low below this depth.

The natural vegetation consists of longleaf, slash, and pond pine; sweetgum; water oak; sweetbay; blackgum; and red maple. The understory is native grasses and shrubs, including gallberry, southern bayberry, inkberry, waxmyrtle, and pineland threeawn.

Wetness is a moderate limitation for cultivated crops. This soil is suited to some cultivated crops, but the variety is limited because the water table is near the surface much of the time. Crops such as corn and soybeans are adapted, but water control is needed (fig. 1). Row crops should be rotated with cover crops; cover crops should be on the land at least half the time. Soil-improving cover crops and all crop residues should be left on the land. Good seedbed preparation, fertilizing, and liming are needed for maximum yields.

This soil is well suited to pasture and hay crops. Such grasses as Coastal bermudagrass and bahiagrasses grow well under good management. White clovers and other legumes are moderately adapted. For best yields, fertilizing, liming, and carefully controlling grazing to maintain plant vigor are required.

This soil has moderately high potential productivity for pine trees. Equipment limitations and seedling mortality are the chief management problems. Slash or loblolly pines are the best species to plant.

The water table, which is moderately high during rainy seasons, and the sandy surface texture are moderate to severe limitations to use of this soil as sites for recreational and urban development. Water-control measures are necessary if this soil is used as a site for recreational and urban development. Adding fill material also helps to offset these limitations. Water control measures are necessary if the soil is used as a site for sanitary landfills or as septic tank absorption fields.

This soil is in capability subclass IIw.

13—Leon sand. This poorly drained, nearly level soil is in the flatwoods. Slopes are generally smooth to slightly convex and range from 0 to 2 percent.

Typically, the surface layer is very dark gray sand about 3 inches thick. The subsurface layer is sand that extends to a depth of 15 inches. The upper 6 inches is gray, and the lower 6 inches is light gray. The subsoil, in sequence, is black, dark reddish brown, and dark brown sand to a depth of about 30 inches. Next is brown sand and then light brownish gray sand to a depth of about 66 inches. Below that, very dark brown sand extends to 80 inches or more.

Included with this Leon soil in mapping are small areas of Albany, Chipley, Foxworth, Allanton, Mandarin, Osier, Pelham, Plummer, Pottsburg, and Rutlege soils. Also included are small areas of soils that are similar to this Leon soil but do not have the deep organic subsoil. In a few areas, there are places where the subsoil is strongly cemented. Also included are small areas of soils that are similar to the Leon soil but are somewhat poorly drained. Included soils make up less than 15 percent of any one mapped area.

This Leon soil has a water table within a depth of 10 inches for 1 month to 4 months and at a depth of 10 to 40 inches for about 9 months in most years. Available water capacity is very low in the surface and subsurface layers and is low in the subsoil. Permeability is rapid in the surface and subsurface layers and is moderate to moderately rapid in the subsoil.

The natural vegetation consists of longleaf, pond, and slash pine; water oak; and an understory of waxmyrtle, sawpalmetto, running oak, fetterbush, gallberry, and pineland threeawn.

Wetness is a severe limitation for cultivated crops. The soil is moderately suited to some crops, but the variety is limited because the water table is near the surface much of the time. Crops such as corn and soybeans are adapted only if adequate water-control measures are applied. Row crops should be rotated with cover crops. Cover crops should remain on the land three-fourths of the year. Soil-improving cover crops and all crops residues should be left on the land. For highest yields,

Figure 1.—Soybeans and slash pines on Leefield sand. With adequate water control, this soil is well suited to corn, soybeans, and timber crops.

good seedbed preparation, fertilizing, and liming are required.

This soil is moderately well suited to pasture and hay crops. Bahiagrasses grow well under good management. White clovers and other legumes are moderately adapted. For maximum yields, fertilizing, liming, and carefully controlling grazing to maintain plant vigor are required.

This soil has moderate potential productivity for pine trees. Equipment limitations, seedling mortality, and windthrow hazard are management problems. Slash pines are the best species to plant.

Use of this soil as sites for recreational or urban development is severely limited because the water table is very high during rainy seasons. A complex water-control system is necessary. Adding 2 to 3 feet of suitable fill material enhances suitability for use as sites for recreational or urban development and as sites for septic tank absorption fields.

This soil is in capability subclass IVw.

15—Stilson sand, 0 to 5 percent slopes. This moderately well drained, nearly level to gently sloping soil is on broad upland areas in the eastern part of the county. Slopes are smooth.

Typically, the surface layer is dark gray sand about 7 inches thick. The subsurface layer is light brownish gray and very pale brown loamy sand about 27 inches thick. The subsoil is light yellowish brown sandy loam that is about 4 inches thick; light yellowish brown sandy clay loam that is mottled with yellowish brown, brownish gray, and weak red and is about 20 inches thick; and reticulately mottled yellow, brown, gray, and red sandy clay loam that extends to a depth greater than 80 inches. The subsoil contains plinthite.

Included with this soil in mapping are small areas of Albany, Blanton, Bonifay, and Leefield soils. Also included are soils that are similar to this Stilson soil except that they are sandy clay in the lower part of the subsoil and a few small areas of soils that have slopes greater than 5 percent. Included soils make up less than 15 percent of any mapped area.

This Stilson soil has a perched water table above the subsoil for brief periods in winter and early in spring following heavy rainfall. Permeability is rapid in the surface and subsurface layers and is moderate in the subsoil. Available water capacity is low in the surface and subsurface layers and is medium in the subsoil. Organic matter content and natural fertility are moderate.

The natural vegetation consists of slash and longleaf pine, white oak, red oak, water oak, and sweetgum. The understory consists of inkberry, waxmyrtle, blackberry, panicum, bluestem species, and pineland threeawn. A few small areas have been cleared and planted to improved pasture grasses.

The slight wetness and the hazard of erosion on the more sloping areas are moderate limitations for cultivated crops. Adapted crops are those that are tolerant of slight wetness. Corn and peanuts are adapted. Row crops should be planted on the contour and in rotation with cover crops. Cover crops should remain on the land at least half the time. Soil-building cover crops and all crop residues should be left on the land. Good seedbed preparation, fertilizing, and liming are required for highest yields.

This soil is well suited to pasture and hay crops. Coastal bermudagrass and improved bahiagrasses grow well when well managed. Several legumes are also well adapted. These plants require fertilizing, liming, and controlled grazing for highest yields.

This soil has high potential productivity for pine trees. Equipment limitations, seedling mortality, and plant competition are management concerns. Slash and loblolly pines are the best species to plant.

Soil limitations that affect use of the soil as sites for most recreational and urban developments are moderate to severe. For brief periods during rainy seasons, a perched water table limits drainage of septic tank absorption fields. Extending the length and increasing the capacity of the filter field generally offset this limitation. The high water table is a moderate limitation to use of this soil as a site for trench sanitary landfills. The soil is adequate cover material for both types of landfill. In rainy seasons, a water-control system is necessary to provide surface drainage of excess water away from trenches and open pits.

This soil is in capability subclass IIs.

16—Stilson sand, 5 to 8 percent slopes. This moderately well drained, sloping soil occurs on upland areas in the eastern part of the county. Slopes are smooth to convex.

Typically, the surface layer is dark gray sand about 7 inches thick. The subsurface layer is light brownish gray and very pale brown loamy sand about 27 inches thick. The subsoil is light yellowish brown sandy loam about 4 inches thick; light yellowish brown sandy clay loam that has yellowish brown, strong brown, brownish gray, and yellowish red mottles and is about 20 inches thick; and reticulately mottled yellow, brown, gray, and red sandy clay loam that extends to a depth of 80 inches or more. The subsoil contains plinthite.

Included with this soil in mapping are small areas of Albany, Blanton, Bonifay, and Leefield soils. Also included are a few small areas of soils that are similar to this Stilson soil but are sandy clay in the lower part of the subsoil, a few small areas of soils similar to the Stilson soil that have slopes less than 5 percent, and a few small areas where the subsoil is less than 5 percent plinthite. Included soils make up less than 15 percent of any mapped area.

This Stilson soil has a perched water table above the subsoil for a few days following heavy rainfall in the winter and early in spring. Permeability is rapid in the surface and subsurface layers and is moderate in the subsoil. Available water capacity is low in the surface and subsurface layers and is medium in the subsoil. Organic matter content and natural fertility are moderate.

The natural vegetation consists of slash and longleaf pine; white, red, and water oak; and sweetgum. The understory consists of inkberry, waxmyrtle, blackberry, panicum, bluestem species, and pineland threeawn. A few small areas have been cleared and are cultivated or planted to improved pasture grasses.

The hazard of erosion and the slight wetness are severe limitations for cultivated crops. When properly managed, the soil is moderately suited to most crops commonly grown in the area. Intensive erosion control and simple water-control measures are needed. Row crops should be planted on the contour in alternate strips with close-growing crops, and crop rotations should keep close-growing crops on the land at least two-thirds of the time. Soil-improving cover crops and all crop residues should be left on the land.

This soil is moderately well suited to pasture and hay crops. Coastal bermudagrass and bahiagrasses are moderately well adapted. They make only moderate response to fertilizer and lime. Controlled grazing is needed to maintain vigorous plants for maximum yields and a good ground cover.

This soil has high potential productivity for pine trees. Plant competition, equipment limitations, and seedling mortality are management problems. Slash and loblolly pines are the best species to plant.

The steepness of slopes, perched water table, and seepage on side slopes are moderate limitations to use of this soil as sites for recreational and urban developments. Steepness of slopes also limits use as septic tank absorption fields unless the fields are laid out on the contour. Use of this soil as sites for trench sanitary landfills is moderately limited. Excess surface water should be removed from the trenches or pits.

This soil is in capability subclass IIIe.

17—Troup sand, 0 to 5 percent slopes. This well drained, nearly level to gently sloping soil is on broad upland areas. Slopes are smooth to convex. Areas of this soil are small to moderate in size.

Typically, the surface layer is dark grayish brown sand about 8 inches thick. The subsurface layer is sandy to a depth of 48 inches and is yellowish brown. The subsoil extends to a depth of 80 inches or more. The upper part is strong brown sandy loam, and the lower part is yellowish red sandy clay loam with a few yellowish and brownish mottles.

Included with this soil in mapping are small areas of Blanton, Bonifay, Foxworth, Stilson, and Lakeland soils. Also included are small areas of soils that have a loamy subsoil within a depth of 20 inches and small areas of soils that are similar to this Troup soil but have slopes of 5 to 8 percent. Included soils make up less than 15 percent of any mapped area.

In this Troup soil, the available water capacity is low in the surface and subsurface layers and is medium in the subsoil. Natural fertility and organic matter content are low throughout the soil. Depth to the water table is more than 72 inches. Permeability is rapid in the surface and subsurface layers and is moderate in the subsoil.

The natural vegetation consists of slash and longleaf pine; live, post, and red oak; huckleberry; and dogwood. The understory is native shrubs and grasses, including pineland threeawn.

This soil has severe limitations for cultivated crops. Droughtiness and rapid leaching of plant nutrients limit the choice of crops and reduce potential yields of adapted crops. Row crops should be planted on the contour in alternating strips with close-growing, soil-improving crops. Crop rotations should keep close-growing, soil-improving cover crops on the land at least two-thirds of the time. The soil-improving crops and the residues of all other crops should be left on the land. All crops should be fertilized and limed. Irrigation of high-value crops, such as watermelons, is usually feasible where irrigation water is readily available.

This soil is moderately suited to improved pasture. Deep-rooted plants such as Coastal bermudagrass and improved bahiagrass are well adapted. They grow well and produce good ground cover when they are limed and fertilized. For maximum yields, controlled grazing is needed to maintain vigorous plants. Yields are occasionally greatly reduced by extended severe droughts.

This soil has moderately high potential productivity for pine trees. Equipment limitations and seedling mortality are the main management problems. Slash and loblolly pine are the best species to plant.

Soil limitations that affect use of this soil as sites for local roads and streets, small commercial buildings, and dwellings without basements are slight. Use of the soil for purposes requiring shallow excavations is severely limited. Shoring of side slopes is required. Use of the soil as sites for sanitary landfills is severely limited. Suitable fill material must be used as a sealer and daily cover for landfills. Rapid permeability allows high-intensity use of septic tank absorption fields. Use of the soil as sites for most recreational developments is severely limited. Additions of topsoil and sodding may be needed in areas used for recreational development.

This soil is in capability subclass IIIs.

18—Troup sand, 5 to 8 percent slopes. This well drained, sloping soil generally is adjacent to well-defined drainageways in uplands. Slopes are smooth to convex. Areas of this soil are small to moderate in size.

Typically, the surface layer is brown sand about 8 inches thick. The subsurface layer is sand to a depth of 56 inches and is yellowish brown, strong brown, and reddish yellow. The subsoil is yellowish red sandy loam and extends to a depth of 80 inches or more.

Included with this soil in mapping are small areas of Blanton, Bonifay, Foxworth, Lakeland, and Stilson soils. Also included are small areas of soils that have a loamy subsoil within a depth of 20 inches, small areas of soils that are similar to this Troup soil but have slopes of less than 5 percent, and some areas where slopes are 8 to 12 percent. Included soils make up less than 15 percent of any mapped area.

In this Troup soil, the available water capacity is low in the surface and subsurface layers and is medium in the subsoil. Natural fertility and organic matter content are low throughout the soil. Depth to the water table is more than 72 inches. Permeability is rapid in the surface and subsurface layers and is moderate in the subsoil.

The natural vegetation consists of slash and longleaf pine; live, post, and red oak; dogwood; huckleberry; and an understory of native shrubs and grasses, including pineland threeawn. Most areas are cutover woodland or have been cleared for improved pastures.

This soil has very severe limitations for cultivated crops. Droughtiness and rapid leaching of plant nutrients limit the choice of plants and reduce potential yields of adapted crops. Soil management should include row crops planted on the contour in alternating strips with close-growing, soil-improving crops. Crop rotations should keep close-growing, soil-improving cover crops on the land at least three-fourths of the time. The soil-improving crops and the residues of all other crops should be left on the land. All crops should be fertilized and limed.

This soil is moderately suited to improved pasture. Deep-rooted plants such as Coastal bermudagrass and improved bahiagrass are well adapted. They grow well and produce good ground cover when they are limed and fertilized. For maximum yields, controlled grazing is needed to maintain vigorous plants. Yields are occasionally greatly reduced by extended severe droughts.

This soil has moderately high potential productivity for pine trees. Equipment limitations and seedling mortality are the main management problems. Slash and loblolly pine are the best species to plant.

Use of this soil as sites for most recreational development and sanitary facilities is severely limited. Septic tank absorption fields should be laid out on the contour. Suitable fill material should be used as a sealer and daily covering for sanitary landfills. Sodding or adding suitable topsoil may be necessary if the soil is used as sites for recreational development. Slopes are a moderate limitation for use as sites for small commercial buildings. Shoring of side slopes is required if the soil is used for purposes that require shallow excavations.

This soil is in capability subclass IVs.

19—Troup sand, 8 to 12 percent slopes. This well drained, strongly sloping soil generally is adjacent to well-defined drainageways on uplands. Slopes are smooth. Areas are small.

Typically, the surface layer is brown sand about 4 inches thick. The subsurface layer is sand to a depth of about 52 inches and is yellowish brown, strong brown, and reddish yellow. The subsoil is yellowish red sandy loam.

Included with this soil in mapping are small areas of Blanton, Bonifay, Foxworth, Lakeland, and Stilson soils. Also included are small areas of soils that are similar to this Troup soil but have slopes of 5 to 8 percent and a few small areas of soils that are similar but have slopes of more than 12 percent. Included soils make up less than 15 percent of any mapped area.

In this Troup soil, available water capacity is low in the surface and subsurface layers and is medium in the subsoil. Natural fertility and organic matter content are low. Depth to the water table is more than 72 inches. Permeability is rapid in the surface and subsurface layers and is moderate in the subsoil.

The natural vegetation consists of slash and longleaf pine; live, post, and red oak; dogwood; huckleberry; and an understory of native shrubs and grasses, including pineland threeawn. Most areas are cutover woodland or have been cleared for improved pastures.

This soil is poorly suited to improved pasture. Deep-rooted plants such as Coastal bermudagrass and improved bahiagrasses are well adapted. They grow well and produce good ground cover when they are limed and fertilized. For maximum yields, controlled grazing is needed to maintain vigorous plants. Yields are occasionally greatly reduced by extended severe droughts.

This soil has moderately high potential productivity for pine trees. Equipment limitations and seedling mortality are the main management problems. Slash and loblolly pine are the best species to plant.

Steepness of slope is a moderate to severe limitation to use of this soil as a site for recreational and urban development. Limitations to use of the soil as septic tank absorption fields are moderate, but the soil can be used as an absorption field if the field is laid out on the contour and not up and down slopes. The length and capacity of filter fields must be increased to prevent seepage. Suitable fill material for sealer and for daily cover are required if the soil is used as a site for sanitary landfills. Slopes limit use for purposes requiring shallow excavations, and side slopes must be shored. Sodding or adding suitable topsoil may be required for recreational development and use.

This soil is in capability subclass VIs.

20—Foxworth sand, 0 to 5 percent slopes. This moderately well drained, nearly level to gently sloping soil occurs between the high upland soils and lower lying, wet flatwoods. It occurs as moderately small areas throughout the county but dominantly in the north, north-central, and northeastern parts. Slopes are smooth to convex.

Typically, the surface layer is grayish brown sand about 4 inches thick. The underlying layer is sand to a depth of 80 inches or more. The upper 4 inches is brown, the next 32 inches is light yellowish brown, the next 28 inches is very pale brown, and the next 12 inches is very light gray or white. Strong brown and yellow mottles are below a depth of 54 inches.

Included with this soil in mapping are small areas of Albany, Blanton, Bonifay, Chipley, Lakeland, Centenary, Pottsburg, Stilson, and Troup soils. Also included are small areas of soils that are similar to this Foxworth soil but have slopes of 5 to 8 percent. Included soils make up less than 15 percent of any mapped area.

This Foxworth soil has a water table at a depth of 40 to 72 inches for 1 month to 3 months during most years and at a depth of 30 to 40 inches for less than 30 days in some years. Available water capacity is low. Permeability is very rapid. Natural fertility and organic matter content are low.

The natural vegetation consists of slash and longleaf pine; live, post, bluejack, and red oak; huckleberry; dogwood; and an understory of native shrubs, sawpalmetto, and pineland threeawn. Some areas have been cleared and are used for crops or for improved pasture.

This soil has severe limitations for most cultivated crops. Droughtiness and rapid leaching of plant nutrients limit the choice of plants and reduce potential yields of adapted crops. When the water table is at a depth of 40 to 72 inches, it provides water through capillary rise to supplement the low available water capacity. In very dry seasons, however, the water table drops well below the root zone and very little capillary water is available to plants. Row crops should be planted on the contour in alternate strips with close-growing crops. Crop rotations should keep close-growing crops on the land at least two-thirds of the time. All crops should be fertilized and limed. Soil-improving cover crops and all crop residues should be left on the land. Irrigation of high-value crops is usually feasible where irrigation water is readily available.

The soil is moderately well suited to adapted grasses for pasture. Coastal bermudagrass and bahiagrasses are well adapted. They produce good yields when they are fertilized and limed. For maximum yields, controlled grazing is needed to maintain vigorous plants.

This soil has moderately high potential productivity for slash pine trees. Equipment limitations and seedling mortality are the main management concerns.

Soil limitations that affect urban and recreational development are moderate to severe. The water table, which is at a depth of 30 inches during rainy seasons, limits septic tank use for a short period. Moderate water-control measures or about 12 inches of fill material are necessary for year-round septic tank use. Cutbanks are subject to caving. The sandy texture is a severe limitation for recreational uses.

This soil is in capability subclass IIIs.

21—Foxworth sand, 5 to 8 percent slopes. This moderately well drained, sloping soil occurs on upland hillsides leading to lower lying, wet flatwoods and drainageways. This soil occurs as small areas throughout the county but dominantly in the northern and north-central parts. Slopes are smooth to convex.

Typically, the surface layer is dark gray sand about 3 inches thick. The underlying layers are sand to a depth of more than 80 inches. The upper 7 inches is grayish brown, and the next 22 inches is light yellowish brown mottled with very pale brown with a few uncoated sand grains. The lower 48 inches is very pale brown mottled with light gray, strong brown, and yellowish red.

Included with this soil in mapping are small areas of Albany, Blanton, Bonifay, Chipley, Lakeland, Centenary, Pottsburg, Stilson, and Troup soils. Also included are small areas of soils that are similar to this Foxworth soil but have slopes of 0 to 5 percent. Included soils make up less than 15 percent of any mapped area.

This Foxworth soil has a water table at a depth of 40 to 72 inches for 1 month to 3 months during most years and at a depth of 30 to 40 inches for less than 30 cumulative days in some years. Available water capacity is very low. Permeability is very rapid. Natural fertility and organic matter content are low.

The natural vegetation consists of slash and longleaf pine; live, post, red, and bluejack oak; huckleberry; sparse dogwood; and an understory of native shrubs and pineland threeawn. Most areas are cutover woodland or have been replanted to slash pine. A few areas have been cleared and are planted to crops or improved pasture.

Droughtiness, rapid leaching of plant nutrients, and the hazard of erosion are very severe limitations to use of these soils for row crops. Soil-improving measures and erosion control measures are required when these soils are cultivated. Row crops should be planted on the contour in strips alternating with strips of close-growing crops. Crop rotations should keep the soil under close-growing plant cover at least three-fourths of the time. All crops need frequent fertilizing and liming. Soil-improving crops and all crop residues should be left on the ground. Irrigation of a few high-value crops may be feasible where irrigation water is readily available. Irrigation systems should be carefully designed to apply water at a rate low enough to prevent runoff and erosion.

The soil is moderately suited to pasture. Deep-rooted plants such as Coastal bermudagrass and bahiagrass grow well when they are fertilized and limed. Yields are severely reduced by occasional drought. Grazing must be carefully controlled to permit plants to maintain their vigor and provide maximum yields and good ground cover.

This soil has moderately high potential productivity for slash pines. Equipment limitations and seedling mortality are the main management concerns.

Seepage and the high water table in these gently sloping to sloping soils are moderate to severe limitations for urban and recreational uses. The high water table limits use as septic tank absorption fields unless water control measures are used. The hazard of cutbanks caving limits use for purposes requiring shallow excavations unless shoring practices are used. The sandy texture is a severe limitation for recreational uses.

This soil is in capability subclass IVs.

22—Pamlico-Dorovan complex. This complex consists of very poorly drained soils that occur in an irregular, intricately mixed pattern. The landscape is mainly depressional areas along low gradient drainageways. Areas of each soil are too small to map separately at the scale used. Areas of this complex are mostly rounded or oblong and are from 10 to 200 acres in size. Individual areas of each soil range from 5 to 100 acres.

The Pamlico soils make up about 40 percent of the complex. Typically, Pamlico soils have black muck about 32 inches thick overlying very dark grayish brown sand that extends to a depth of 80 inches or more.

The Pamlico soils are ponded after flooding for 4 to 8 months in most years. Even when they are not covered with water, these soils have a water table within a depth of 10 inches most of the time unless they are artificially drained. Only during the driest season, which is usually late in fall, does the water table briefly recede to a depth of 40 inches or more. Pamlico soils are moderate in permeability and have very high available water capacity.

The Dorovan soils make up about 35 percent of the complex. Typically, Dorovan soils are black muck to a depth of 60 inches or more overlying very dark grayish brown sand that extends to a depth of 80 inches or more.

The Dorovan soils are ponded after flooding for 6 to 12 months in most years unless they are artificially drained. Even when they are not ponded, they have a water table within 10 inches of the surface most of the time unless drained. Only during the driest season, which is usually late in fall, is the water table at a lower depth. Then it may briefly recede to a depth of 40 inches or more. Dorovan soils are moderate in permeability and have very high available water capacity.

Soils of minor extent make up about 25 percent of the complex. Rutlege soil makes up about 10 percent. Other minor soils are Alapaha, Pansey, Pantego, Plummer, Pottsburg, and Rains soils, which occur in about equal proportion. These soils generally are on the edges of the complex.

The natural vegetation consists mostly of water-tolerant hardwoods such as water oak, sweetbay, blackgum, red maple, black willow, alder, and cypress. Around the perimeter of mapped areas, the vegetation is pond pine, shortleaf pine, and slash pine. Almost all areas are still in natural vegetation and provide habitat for wildlife.

In their natural condition, these soils are not suitable for cultivation, but with adequate water control they are suited to some row crops and most vegetable crops. The water-control system should remove excess water during times when crops are on the land and should keep the soils saturated with water at all other times. Fertilizers that contain phosphates, potash, and trace elements are needed. Water-tolerant cover crops should be planted when the soils are not in use for row crops. All crop residues and cover crops should be left on the land.

Most adapted improved grasses and clovers grow well on these soils if water is properly controlled. Water control should maintain the water table near the surface to prevent excessive oxidation of the organic layer. Fertilizers high in potash, phosphorus, and trace elements are needed. Grazing should be controlled to permit maximum yields.

These soils have moderate potential productivity for woodland. The high water table results in high seedling mortality and severely limits the use of equipment. Overcoming the excessive wetness of these soils is difficult.

Flooding, thick layers of organic material, and the high water table are severe limitations to use of these soils as sites for urban, sanitary, and recreational uses. Installing water-control systems, removing the organic material, and backfilling with suitable soil material are necessary for most uses. Subsidence of the organic layers and low strength are limitations for uses that require shallow excavations.

The soils in this complex are in capability subclass VIIw.

23—Chipley sand, 0 to 5 percent slopes. This somewhat poorly drained, nearly level to gently sloping soil is between the higher upland soils and lower lying, wet flatwoods. It occurs as small areas throughout the county but predominantly in the central part. Slopes are smooth to convex and range from 0 to 5 percent.

Typically, the surface layer is dark gray sand about 4 inches thick. The underlying layers are sand to a depth of 80 inches or more. The upper 4 inches is grayish brown; the next 12 inches is light yellowish brown; the next 18 inches is very pale brown mottled with light gray and reddish yellow; the next 16 inches is light brownish gray mottled with light gray, yellow, and very pale brown; and the lower 26 inches is light gray.

Included with this soil in mapping are small areas of Albany, Blanton, Foxworth, Centenary, Lakeland, Leon, Pelham, Plummer, Pottsburg, Hurricane, and Rutlege soils. Also included are soils that are similar to this Chipley soil in most soil properties, including depth to the water table, but have brighter colors in the upper 40 inches. Included soils make up less than 15 percent of any mapped area.

This Chipley soil has a water table at a depth of 30 to 40 inches for 1 month to 3 months and at a depth of 40 to 60 inches for 3 to 6 months in most years. Available water capacity is low. Permeability is rapid. Natural fertility and organic matter content are low.

The natural vegetation consists of slash and longleaf pine; post, bluejack, and turkey oak; huckleberry; dogwood; and an understory of native shrubs, sawpalmetto, bluestem, and pineland threeawn. Most areas are cutover woodland or have been replanted to slash pines. Some areas have been cleared for improved pasture of bahiagrasses.

This soil has severe limitations for cultivated crops. Without good water control, this soil is poorly suited to cultivated crops. With good management, including water control, it is moderately suited to most crops commonly grown in this area. Soil-improving cover crops and all crop residues should be left on the land. Drainage and bedding are needed for crops that are damaged by wetness.

This soil is moderately well suited to pasture and hay crops. Coastal bermudagrass and bahiagrasses are moderately well adapted. They make moderate response to fertilizer and lime. Controlled grazing is needed to maintain vigorous plants for maximum yields and a good ground cover.

Under a high level of management, this soil has high potential productivity for slash pine. Equipment limitations and seedling mortality are the main management problems.

The water table, which fluctuates between depths of 20 and 40 inches during rainy seasons, is a severe limitation to use of this soil as sites for most urban development. Water-control measures to lower the water table and maintain it at the desired depth are necessary for both urban and recreational uses. The hazard of cutbanks caving and the high water table are severe limitations for shallow excavations. Shoring or a gradual sloping of cuts is necessary.

This soil is in capability subclass IIIw.

24—Chipley sand, 5 to 8 percent slopes. This somewhat poorly drained, sloping soil is on upland hillsides leading to lower lying, wet flatwoods and drainageways. This soil occurs in small areas, mostly in the northern and eastern parts of the county. Slopes are smooth to convex.

Typically, the surface layer is dark gray sand about 3 inches thick. The underlying layers are sand to a depth of more than 80 inches. The upper 4 inches is grayish brown, the next 10 inches is light yellowish brown, the next 20 inches is very pale brown mottled with light gray and reddish yellow, and the lower 43 inches is light gray.

Included with this soil in mapping are small areas of Albany, Blanton, Foxworth, Lakeland, Leon, Plummer, Pottsburg, and Rutlege soils. Also included are small areas of soils that are similar to this Chipley soil but have slopes of 0 to 5 percent. Included soils make up less than 15 percent of any mapped area.

This Chipley soil has a water table within 40 to 60 inches of the surface for 3 to 6 months and within 20 to 40 inches for 1 month to 3 months in most years. Available water capacity is low. Permeability is rapid. Natural fertility and organic matter content are low.

The natural vegetation consists of slash and longleaf pine; live, post, bluejack, and turkey oak; huckleberry; very sparse dogwood trees; and an understory of native shrubs and sawpalmetto, bluestem, and pineland threeawn. Most areas are cutover woodland or have been cleared and replanted to slash pine.

Rapid leaching of plant nutrients, wetness, and the hazard of erosion are very severe limitations to using this soil for cultivated row crops. Good water control, soil-improving measures, and erosion control measures are required if this soil is cultivated. Row crops should be planted on the contour in strips alternating with strips of close-growing crops. Crop rotations should keep the soil under close-growing plant cover at least three-fourths of the time. All crops need frequent fertilizing and liming. Soil-building cover crops and all crop residues should be left on the ground.

This soil is moderately suited to pasture. Deep-rooted plants such as Coastal bermudagrass and bahiagrasses grow well if they are fertilized and limed. Yields are occasionally restricted by wetness in rainy seasons and by occasional drought. Grazing must be highly restricted to permit plants to maintain vigor to provide maximum yields and good ground cover.

This soil has high potential productivity for slash pines. The equipment limitation is the main management concern.

The seasonal high water table and the severe hazard of cutbanks caving are severe limitations for most urban and recreational development. Low strength is also a limitation. Water-control measures are necessary to lower the water table and to maintain it at the desired depth. Shoring of side slopes or slanting side slopes are required for shallow excavations.

This soil is in capability subclass IVs.

25—Hurricane sand. This somewhat poorly drained, nearly level soil occurs between the uplands and the lower lying wet flatwoods. It occurs in small to moderately small areas throughout the county but dominantly in the northern half. Slopes are smooth to slightly convex and range from 0 to 2 percent.

Typically, the surface layer is grayish brown sand about 6 inches thick. The subsurface layer is sand that extends to a depth of 51 inches. The upper 4 inches is brown, the next 12 inches is light yellowish brown, the next 12 inches is very pale brown, and the last 17 inches is light gray. The upper 4 inches of the subsoil is brown loamy sand, and the lower part is mixed black and dark reddish brown sand.

Included with this soil in mapping are small areas of Chipley, Foxworth, Centenary, Leon, Allanton, Osier, Plummer, Pottsburg, and Rutlege soils. Also included are soils that are similar to this Hurricane soil but have a less well developed dark organic stained subsoil. Included soils make up less than 15 percent of any map unit.

This Hurricane soil has a water table at a depth of 40 to 60 inches for 3 to 6 months in most years and at a depth of 20 to 40 inches for 1 month to 3 months in some years. Available water capacity is low and very low in the surface and subsurface layers and is medium in the subsoil. Permeability is very rapid in the surface and subsurface layers and is moderately rapid in the subsoil. Natural fertility is low. Organic matter content is moderate in the surface layer and is low in the rest of the soil.

The natural vegetation consists of slash and longleaf pine; bluejack, turkey, and post oak; and an understory of native shrubs, sawpalmetto, inkberry, broomsedge, bluestem, and pineland threeawn. Most areas are cutover woodland or are planted to slash pines. Some areas have been cleared for improved pasture.

This soil has severe limitations for cultivated crops. Without good water control, this soil is poorly suited to cultivated crops; but with good management, this soil is moderately suited to most adapted crops. Soil-improving cover crops and all crop residues should be left on the land. Drainage and bedding are needed for crops that are damaged by wetness.

This soil is moderately well suited to pasture and hay crops. Coastal bermudagrass and bahiagrasses are moderately well adapted. They make moderate response to fertilizer and lime. Controlled grazing is needed to maintain vigorous plants for maximum yields and a good ground cover.

This soil has high potential productivity for slash and longleaf pine. Equipment limitations and seedling mortality are the main management problems. Slash pines are the best species to plant (fig. 2).

This soil has severe limitations for most urban and recreational development. Water-control measures are necessary to lower the water table and to maintain it at a proper depth for septic tank filter fields. The hazard of cutbanks caving is severe. Shoring is necessary if shallow excavations are made in this soil. Fill material must be added if water-control measures are not used. Surface stabilization is necessary for recreational uses.

This soil is in capability subclass IIIw.

26—Centenary sand, 0 to 5 percent slopes. This moderately well drained, nearly level to gently sloping soil is between the higher upland soils and the lower lying, wet flatwoods. It occurs as small areas throughout the county but dominantly in the northern half.

Typically, the surface layer is brown sand about 9 inches thick. The subsurface layer is sand and extends to about 73 inches. The upper 22 inches is brownish yellow, the next 18 inches is very pale brown, and the lower 24 inches is white. The upper 4 inches of the

Figure 2.—Slash pine on Hurricane sand. This soil has high potential productivity for slash and longleaf pine.

subsoil is brown loamy sand, and the lower part is black sand that extends to a depth of more than 80 inches.

Included with this soil in mapping are small areas of Albany, Blanton, Chipley, Foxworth, Lakeland, Leon, Osier, Pottsburg, and Rutlege soils. Also included are small areas of soils that have properties similar to those of this Centenary sand but are better drained. Included soils make up less than 15 percent of any mapped area.

This Centenary soil has a water table at a depth of 40 to 60 inches for 1 month to 3 months during most years and at a depth of 30 to 40 inches for brief periods in some years. Available water capacity is low in the surface layer, very low in the subsurface layer, and low in the subsoil. Permeability is very rapid in the surface and subsurface layers and is moderately rapid in the subsoil. Natural fertility and organic matter content are low.

The natural vegetation consists of slash and longleaf pine; live, post, bluejack, and red oak; huckleberry; persimmon; and dogwood. The understory is native shrubs and pineland threeawn. Most areas are cutover woodland or have been replanted to slash pine. Some small areas have been cleared for crops, and some have been cleared for improved pasture, generally bahiagrasses.

This soil has severe limitations for most cultivated crops. Droughtiness and rapid leaching of plant nutrients limit the choice of plants and reduce potential yields of adapted crops. The water table, which is at a depth of 40 to 72 inches, provides water through capillary rise to supplement the low available water capacity. In very dry seasons, the water table drops well below the root zone and little capillary water is available to plants. Row crops should be planted on the contour in alternate strips with close-growing crops. Crop rotations should keep close-growing crops on the land at least two-thirds of the time. All crops should be fertilized and limed. The soil-improving cover crops and all crop residues should be left on the ground. Tile or another type of drainage is needed for some crops that are damaged by the high water table during the growing season.

The soil is moderately well suited to pasture. Coastal bermudagrass and bahiagrasses are well adapted. They produce good yields when they are fertilized and limed. For maximum yields, controlled grazing is needed to maintain vigorous plants.

This soil has high potential productivity for pine trees. Equipment limitations and seedling mortality are the main management concerns. Slash and loblolly pines are the best species to plant.

The water table, which fluctuates to within 30 inches of the surface in rainy seasons, is a moderate limitation to use of this soil as septic tank absorption fields. Water-control measures that maintain the water table at a depth greater than 30 inches are necessary. Soil limitations that affect local roads and streets, dwellings without basements, and small commercial buildings are slight. Limitations that affect shallow excavations, recreational uses, and sanitary landfills are severe. Surface stabilization is needed if areas are used for recreational activities. Measures needed to use this soil for shallow excavations include shoring of sidewalls. Suitable material should be used as a sealer and as daily cover if the soil is used as a site for sanitary landfills.

This soil is in capability subclass IIIs.

27—Mandarin sand. This somewhat poorly drained, nearly level soil is on low ridges and knolls in the flatwoods. Slopes are generally smooth to slightly convex and range from 0 to 2 percent.

Typically, the surface layer is gray sand about 7 inches thick. The subsurface layer is white sand about 18 inches thick. The subsoil is dark brown sand to a depth of about 36 inches and then brown and dark brown sand to about 57 inches. The substratum is light brownish gray sand to a depth of 80 inches or more.

Included with this soil in mapping are small areas of Chipley, Foxworth, Centenary, Kureb, Leon, Resota, and Hurricane soils. Also included are small areas of soils that are similar to this Mandarin soil but have a thinner subsoil or organic stained layer and small areas of soils that are similar to Mandarin soil but are poorly drained. Included soils make up less than 15 percent of any mapped area.

This Mandarin soil has a water table at a depth of 20 to 30 inches for 1 month to 3 months and at a depth of 30 to 60 inches for about 9 months in most years. Available water capacity is very low in the surface and subsurface layers and is low in the subsoil. Permeability is rapid in the surface and subsurface layers and is moderate in the subsoil.

The natural vegetation consists of longleaf and slash pine; water, bluejack, turkey, and post oak; and an understory of waxmyrtle, sawpalmetto, running oak, fetterbush, and pineland threeawn.

Rapid permeability and low available water capacity are very severe limitations for cultivated crops. Row crops should be rotated with cover crops; cover crops should be on the land three-fourths of the time. Soil-improving cover crops and all crop residues should be left on the land. Maximum yields require good seedbed preparation, fertilizing, and liming.

This soil is moderately suited to pasture and hay crops. Bahiagrasses grow well under good management. Maximum yields require fertilizing, liming, and carefully controlling grazing to maintain plant vigor.

This soil has moderate potential productivity for pine trees. Equipment limitations and seedling mortality are the main management problems. Slash pines are the best trees to plant.

A water table that is moderately high during rainy seasons is a moderate to severe limitation for recreational and urban development. Water-control measures must be used or fill material must be added if this soil is used for recreational or urban development or as septic tank absorption fields. The sandy texture and the hazard of cutbanks caving are limitations to uses that require shallow excavations. Shoring of side slopes is required.

This soil is in capability subclass VIs.

28—Allanton sand. This poorly drained soil is on nearly level or slightly depressional areas along poorly defined drainageways. Slopes are smooth to concave and range from 0 to 2 percent.

Typically, the surface layer is black and very dark gray sand about 18 inches thick. The upper part of the subsurface layer is gray sand about 9 inches thick, and the lower part is light gray sand about 25 inches thick. The upper 4 inches of the subsoil is very dark gray sand. The lower part is black sand that extends to a depth of 80 inches or more. The sand grains are coated with organic matter.

Included in mapping are small areas of Chipley, Dorovan, Leon, Osier, Pamlico, Pickney, Pottsburg, and Rutlege soils. Also included in a few areas are small areas of soils that have properties similar to those of this Allanton soil but have a thinner dark surface layer. Also included in a few areas are unnamed soils that have properties and colors similar to those of this Allanton soil in the upper 10 to 20 inches but have a sandy loam subsoil. Included soils make up less than 25 percent of any mapped area.

This Allanton soil has a water table at or near the surface for 4 to 6 months during most years, and most low-lying areas and drainageways are flooded for 4 to 6 months annually. Available water capacity is low to medium in the surface layer and is low in the other layers. Permeability is rapid to moderately rapid above the subsoil and is moderately rapid in the subsoil. Internal drainage is very slow, impeded by the high water table. Natural fertility is medium, and organic matter content is moderate to a depth of 22 inches and low below 22 inches.

The natural vegetation consists of buckwheattree, sweetbay, blackgum, and cypress and scattered slash and longleaf pine. The understory is gallberry, waxmyrtle, and pineland threeawn.

Wetness is a very severe limitation for cultivated crops. Choice of adapted crops is very limited. Intensive water management is required for any cultivated crop. With adequate water control, such crops as corn and soybeans can be grown. Seedbed preparation should include mounding and bedding of the rows. Adequate applications of lime and fertilizer are required. Crop rotations should keep close-growing, soil-improving crops on the land for at least two-thirds of the time. All crop residues should be left on the surface.

With adequate water control and proper management, this soil is moderately well suited to pasture and hay crops. Coastal bermudagrass, bahiagrass, and white clovers are adapted. Surface ditches are needed to remove excess water rapidly during heavy rains. Fertilizer and lime are needed. Grazing should be controlled to prevent overgrazing and to maintain plant vitality.

This soil has moderately high potential productivity for slash and loblolly pine and sweetgum. Adequate water control is necessary before trees can be planted. Equipment limitations and seedling mortality resulting from excessive wetness are the main management concerns. Slash and loblolly pines are the best species to plant.

Use of this soil as sites for most urban and recreational uses is severely limited. A water-control system is required before any type of urban development or recreational development could be initiated. Mounding and filling would be required in addition to water-control measures.

This soil is in capability subclass Vw.

29—Rutlege sand. This very poorly drained soil is on nearly level or slightly depressional areas along drainageways. Slopes are smooth to concave and range from 0 to 2 percent.

Typically, the surface layer is sand about 22 inches thick. The upper 13 inches is black, and the lower 9 inches is very dark gray. The next layer is gray sand 33 inches thick, and the lower layer is 25 inches thick and is light gray sand mottled with yellow and brown.

Included with this soil in mapping are small areas of Dorovan, Leon, Allanton, Mandarin, Osier, Pamlico, Pantego, Pickney, Pottsburg, and Rains soils. In a few mapped areas, there is a sandy loam subsoil. Small areas of soils that are similar to this Rutlege soil but have a dark surface horizon less than 10 inches thick are included in some mapped areas. Included soils make up less than 20 percent of any mapped area.

This Rutlege soil has a water table at or near the surface for 4 to 6 months during most years and is ponded for 4 to 6 months annually. Available water capacity is low. Permeability is rapid. Internal drainage is very slow, impeded by the high water table. Natural fertility is medium, and organic matter content is high in the surface layer.

The natural vegetation is buckwheattree, sweetbay, blackgum, cypress, and scattered slash pine. The understory is gallberry, waxmyrtle, pineland threeawn, and various reeds and sedges.

Wetness is a very severe limitation for cultivated crops. Without intensive water control, the number of adapted crops is very limited. With adequate water control, such crops as corn and soybeans can be grown. The water-control system should provide a means of removing excess surface water rapidly after heavy rains and provide rapid internal drainage to the upper layers. Seedbed preparation should include bedding of the rows. Regular applications of lime and fertilizer are needed. Crop rotations should keep close-growing, soil-improving crops on the land at least two-thirds of the time. All crop residues and soil-improving crops should be left on the surface.

When properly managed, this soil is moderately suited to pasture and hay crops. Tall fescuegrass, Coastal bermudagrass, bahiagrass, and white clovers are well adapted. Surface ditches are needed to remove excess surface water rapidly during heavy rains. Fertilizer and lime are needed. Grazing should be controlled to prevent overgrazing and reduction of plant vitality.

Where adequate water-control systems are installed, this soil has high potential productivity for slash and loblolly pine, sweetgum, and water tupelo. Equipment limitations and seedling mortality caused by excessive wetness are the main management concerns. Adequate water control is necessary before trees can be planted. Loblolly and slash pine are the best species to plant.

The high water table and ponding of depressional areas during rainy seasons are severe limitations to use of this soil as sites for recreational and urban development uses. Complex and intensive water-control systems are required for any of these uses. Fill material 3 feet or more thick and surface ditches for rapid removal of excess surface water are required. The high water table limits functioning of septic tank absorption fields. The hazard of cutbanks caving limits use for purposes that require shallow excavations. Shoring of side slopes is required for all excavations. The high water table and sandy texture limit the use of this soil as sites for sanitary landfill.

This soil is in capability subclass IVw.

30—Pottsburg sand. This poorly drained soil is on nearly level, low-lying areas of the flatwoods. Slopes are 0 to 2 percent.

Typically, the surface layer is dark gray sand about 5 inches thick. The subsurface layer is grayish brown sand about 7 inches thick overlying light grayish brown sand about 18 inches thick. The next layer is light gray sand about 30 inches thick over brown sand about 4 inches thick. The subsoil is very dark gray to black sand that extends to a depth of more than 80 inches. Dominantly all the sand grains in this layer are coated with organic matter.

Included with this soil in mapping are small areas of Albany, Chipley, Foxworth, Centenary, Leon, Allanton, Mandarin, Osier, Pamlico, Hurricane, Plummer, and Rutlege soils. Also included are a few small areas of soils that are similar to this Pottsburg soil in drainage and properties but have a brown or dark grayish brown layer 2 to 5 inches thick at a depth of 30 to 50 inches. A few small, wet depressional areas are also included in some mapped areas. Included soils make up less than 15 percent of any mapped area.

This Pottsburg soil has a water table within a depth of 10 inches for 4 to 6 months during most years. Some included low-lying areas are ponded for 2 to 6 months annually. Permeability is rapid in the surface and subsurface layers and is moderate in the subsoil. Internal drainage is very slow, impeded by the high water table. Available water capacity is low in the surface layer and is moderate in the subsoil. Natural fertility and organic matter content are moderately high in the upper 5 inches and are low between that depth and a depth of about 64 inches. Below 64 inches, organic matter content is high.

The natural vegetation consists of sweetbay, buckwheattree, blackgum, water oak, scattered slash and longleaf pine, inkberry, gallberry, sawpalmetto, waxmyrtle, and pineland threeawn.

Wetness is a severe limitation for cultivated crops. Without intensive water control, the number of adapted crops is very limited. With adequate water control, such crops as corn and soybeans can be grown. The water-control system should provide a means of removing excess surface water rapidly after heavy rains and provide rapid internal drainage to the upper layers. Seedbed preparation should include bedding or mounding of the rows. Crop rotations should keep close-growing, soil-improving crops on the land at least two-thirds of the time. All crop residues and soil-improving crops should be left on the land.

Under good management, this soil is moderately well suited to pasture and hay crops. Coastal bermudagrass, bahiagrasses, and white clover are moderately well adapted. They grow well under good management. Surface ditches are needed to remove excess surface water rapidly during heavy rains. Fertilizer and lime are needed. Grazing should be controlled to prevent overgrazing and reduction of plant vitality.

This soil has moderate potential productivity for loblolly and slash pine and sweetgum, American sycamore, and water tupelo. Equipment limitations and seedling mortality caused by excessive wetness are the main management concerns. Adequate water control is necessary before trees can be planted. Seedbed preparation should include bedding or mounding of the rows.

The high water table is a severe limitation to use of this soil as a site for recreational or urban development. Complex water-control systems are required if these soils are developed for urban or recreational uses. Fill material 3 feet or more thick or surface ditches to remove excess surface water rapidly are required. Septic tank absorption fields will not function adequately unless the water table is lowered or fill material is added. The sandy texture and high water table are severe limitations to use of this soil as sites for sanitary landfills. The hazard of cutbanks caving limits use of the soil for purposes that require shallow excavations. Shoring of side slopes is required.

This soil is in capability subclass IVw.

31—Osier fine sand. This poorly drained soil is in nearly level or slightly depressional areas and flatwoods. Slopes are 0 to 2 percent.

Typically, the surface layer is black fine sand about 8 inches thick. The subsurface layer is dark gray fine sand about 26 inches thick. The underlying layer is dark gray fine sand about 10 inches thick, dark gray fine sand about 17 inches thick, gray fine sand about 8 inches thick, and gray fine sand that extends to a depth of 80 inches or more.

Included with this soil in mapping are small areas of Albany, Chipley, Dorovan, Leon, Allanton, Mandarin, Pamlico, Pottsburg, Hurricane, Pelham, Plummer, and Rutlege soils. Included soils make up less than 15 percent of any mapped area.

This Osier soil has a water table within a depth of 10 inches for 3 to 6 months in most years. Most depressional areas are ponded for 2 to 4 months annually. Permeability is rapid, but internal drainage is very slow because it is impeded by the high water table. Natural fertility and organic matter content are moderately high in the upper 6 inches and are low below that depth. Available water capacity is low.

The natural vegetation consists of sweetbay, buckwheattree, blackgum, water oak, slash and longleaf pine, inkberry, sawpalmetto, waxmyrtle, and pineland threeawn.

This soil is not suitable for cultivation in its natural state. With adequate water control, however, a few crops can be grown. The water-control system should provide a means of removing excess surface water rapidly after heavy rains and provide rapid internal drainage to the upper layers. Seedbed preparation should include bedding or mounding of the rows. Crop rotations should keep close-growing, soil-improving crops on the land at least two-thirds of the time. All crop residues and soil-improving crops should be left on the land.

Under good management, this soil is moderately well suited to pasture and hay crops. Coastal bermudagrass, bahiagrasses, and white clover are moderately well adapted. They grow well under good management. Surface ditches are needed to remove excess surface water rapidly during heavy rains. Fertilizer and lime are needed. Grazing should be controlled to prevent overgrazing and reduction of plant vitality.

This soil has moderately high potential productivity for loblolly and slash pine. Equipment limitations and seedling mortality caused by excessive wetness are the main management concerns. Adequate water control is necessary before trees can be planted.

The high water table and ponding during rainy seasons are severe limitations for recreational or urban development. Installation and maintenance of complex water-control systems are necessary for most recreational and urban development uses. Adding fill material 2 to 4 feet thick is necessary for most recreational and urban uses, if other water control measures are not used. The hazard of cutbanks caving and the high water table limit use of the soil for purposes requiring shallow excavations. Limitations to use of this sandy soil as sites for trench and area sanitary landfills are severe. This sandy soil is unsuited to use as cover material.

This soil is in capability subclass Vw.

32—Plummer sand. This poorly drained, nearly level soil is in low-lying areas and in poorly defined drainageways. Slopes are concave to smooth and range from 0 to 2 percent.

Typically, the surface and subsurface layers are sand about 48 inches thick. The upper 7 inches is dark gray, the next 18 inches is gray, and the lower 23 inches is light gray. The upper 11 inches of the subsoil is gray sandy loam mottled in brown and yellow, and the lower 21 inches is gray sandy clay loam mottled in shades of red, yellow, and brown.

Included with this soil in mapping are small areas of Albany, Pelham, Pottsburg, Rains, and Rutlege soils. Also included are small areas of soils that have properties similar to those of this Plummer soil but have a thick dark surface layer and a few small areas of soils that are similar to this Plummer soil but have 2 to 5 percent slopes. In a few mapped areas, the subsoil is coarser in texture.

This Plummer soil has a water table at a depth of less than 10 inches for 3 to 6 months during most years. Some low-lying areas are ponded for brief periods in most years. Permeability is moderately rapid in the surface and subsurface layers and is moderate in the subsoil. Available water capacity is low in the surface and subsurface layers and is medium in the subsoil. Internal drainage is slow, impeded by the high water table. Natural fertility and organic matter content are moderate in the surface layer and are low below.

The natural vegetation consists mostly of slash and longleaf pine, sweetgum, water oak, and cypress. The understory is gallberry, pineland threeawn, pitcher plants, and waxmyrtle.

Wetness and the thick sandy layers above the subsoil are very severe limitations for cultivated crops. Intensive water-control measures are needed before these soils are suitable for cultivated crops. Soil-improving cover crops and all crop residues should be left on the land. Bedding of the rows is needed for crops that are damaged by wetness.

This soil is moderately suited to pasture. Most improved grasses and legumes are poorly suited. Under good management, which includes water control, fertilizing, liming, and controlled grazing, these soils produce moderate yields of pasture grasses.

This soil has high potential productivity for pine trees, but water control is needed to achieve the potential. Bedding or mounding is necessary for seedling survival. Equipment limitations and seedling mortality are the main management concerns. Loblolly pine and slash pine are the best species to plant.

The high water table and ponding during rainy seasons are severe limitations for recreational or urban development. Installation and maintenance of complex water-control systems are necessary for most recreational and urban development uses. Either fill material 3 feet or more thick or a water-control system that removes excess surface water or both fill and a water-control system are required for most uses. The sandy texture and the high water table are severe limitations to use of this soil as sites for sanitary landfill. The hazard of cutbanks caving is a severe limitation to use for purposes that require shallow excavations. Side slopes need to be shored before excavations can be made.

This soil is in capability subclass IVw.

33—Pelham sand. This deep, poorly drained, nearly level soil is on broad flats and slightly depressional areas along poorly defined drainageways. Slopes are smooth to concave and range from 0 to 2 percent.

Typically, the surface layer is dark gray sand about 6 inches thick. The subsurface layer is sand to a depth of about 34 inches. The upper 18 inches is light brownish gray, and the next 10 inches is light gray. The subsoil extends to a depth of 80 inches or more. The upper 4 inches is light brownish gray sandy loam; the next 20 inches is light brownish gray sandy clay loam with pale brown, yellow, and yellowish brown mottles; and the lower part is light gray sandy clay loam with mottles of yellow, brown, red, and gray.

Included with this soil in mapping are small areas of Alapaha, Albany, Allanton, Blanton, Chipley, Foxworth, Centenary, Leefield, Osier, Plummer, Pottsburg, Hurricane, Rains, Rutlege, and Stilson soils. Included soils make up less than 15 percent of any mapped area.

This Pelham soil has a water table within a depth of 15 inches for 3 to 6 months during most years and is subject to brief periods of flooding. Available water capacity is low in the surface and subsurface layers and is medium in the subsoil. Permeability is rapid in the surface and subsurface layers and is moderate in the subsoil. Natural fertility is low. Organic matter content is generally medium to moderately high in the surface layer and is low in the subsurface layer.

The natural vegetation consists of longleaf and slash pine, sweetgum, blackgum, sweetbay, water oak, and cypress and an understory of gallberry, waxmyrtle, and pineland threeawn.

Wetness is a very severe limitation for use as cropland. With good water control and good management, this soil is moderately suited to most crops commonly grown in the area. Intensive water control measures are necessary for cultivated crops. Crop rotations should include close-growing crops at least three-fourths of the time. Soil-improving cover crops and all crop residues should be left on the land. Drainage and bedding are needed for crops that are damaged by wetness.

This soil is moderately suited to pasture and hay crops if adequate water-control measures are installed. Coastal bermudagrass and bahiagrasses are moderately well adapted to this soil. They have moderate response to fertilizer and lime. Controlled grazing is needed to maintain vigorous plants for maximum yields and a good ground cover.

This soil has high potential productivity for slash, loblolly, and longleaf pine if water control measures are applied. Equipment limitations and seedling mortality are the main management problems. Bedding or mounding increases pine growth and decreases seedling mortality.

Flooding and the very high water table during rainy seasons are severe limitations to use of this soil as sites for recreational or urban development. A complex water-control system is necessary for these uses. Adding 2 to 3 feet of suitable fill material will help to overcome most limitations for urban or recreational development and to improve functioning of septic tank absorption fields.

This soil is in capability subclass IVw.

36—Alapaha loamy sand. This poorly drained, nearly level soil occurs in wet depressional areas along poorly defined drainageways in the flatwoods. Slopes are smooth to concave and range from 0 to 2 percent.

Typically, the surface and subsurface layers are loamy sand about 32 inches thick. The upper 6 inches is very dark gray, the next 8 inches is dark gray, and the lower 18 inches is gray. The subsoil is sandy clay loam to a depth of 72 inches or more. The upper 18 inches is light gray with yellowish brown mottles. The next 14 inches is light gray with yellow, yellowish brown, strong brown, and red mottles and is more than 5 percent plinthite. The next layer is similar but has a slightly higher clay content and has mottles that are similar to those in the layer above in color but are larger.

Included with this soil in mapping are small areas of Albany, Leefield, Osier, Pansey, Pamlico, Pelham, Plummer, and Rains soils. Also included in a few small areas are soils that are similar to this Alapaha soil in drainage and horizons but that have a sandy loam subsoil about 20 inches thick underlain by sandy material. Also included, in a few areas, are soils that are similar to the Alapaha soil except that the subsoil is sandy clay. In a few depressional areas, the surface layer is dark and is thicker than is typical for Alapaha soils. Included soils make up less than 20 percent of any mapped area.

This Alapaha soil has a water table at a depth of less than 15 inches for 3 to 6 months during most years and is subject to brief periods of flooding when the water table is high. Permeability is rapid in the surface and subsurface layers and is moderately slow in the subsoil. Internal drainage is slow because it is impeded by the high water table. Natural fertility and organic matter content are moderately high to a depth of about 14 inches and are low below this depth. Available water capacity is low in the surface and subsurface layers and is medium in the subsoil.

The natural vegetation consists of slash and longleaf pine, scattered sweetgum, blackgum, water oak, red maple, and an understory of scattered inkberry, waxmyrtle, a few sawpalmetto, and abundant pineland threeawn. Most of the areas are in cutover forests or woodland.

This soil is not suitable for cultivated crops and is poorly suited to improved pasture because of wetness.

This soil has high potential productivity for loblolly and slash pine, but a good water-control system to remove excessive water is necessary if the potential is to be realized. The equipment limitation is the main management concern. Slash and loblolly pine are the most suitable species for planting.

Use of this soil as sites for recreational or urban development is severely limited by the high water table and the flooding during rainy seasons. Complex water-control systems must be installed and maintained and fill material 3 to 4 feet thick must be added if the soil is used as sites for most recreational and urban uses.

This soil is in capability subclass Vw.

37—Rains sand. This poorly drained, nearly level soil occurs in low-lying positions on the coastal plain and in depressional areas. Slopes are smooth and range from 0 to 2 percent.

Typically, the surface layer is very dark gray sand about 6 inches thick. The subsurface layer is gray sand 7 inches thick. The upper 45 inches of the subsoil is gray sandy clay loam with brown and yellow mottles, and the next 15 inches is a mixture of pale brown, reddish yellow, and gray sandy clay loam. The substratum is gray loamy sand.

Included with this soil in mapping are small areas of Pantego, Pelham, Plummer, Hurricane, and Rutlege soils. Also included are a few small areas of soils that are similar to this Rains soil but have a thick, black surface layer high in organic matter. Included soils make up less than 15 percent of any mapped area.

This Rains soil has a water table at a depth of less than 10 inches for 2 to 6 months during most years. Available water capacity is low in the surface and subsurface layers and is medium in the subsoil. Permeability is rapid in the surface and subsurface layers and is moderate in the subsoil. Natural fertility is low. Organic matter content is low.

The natural vegetation is slash pine, blackgum, and scattered cypress. The understory is mainly native grasses, predominantly pineland threeawn. Low gallberry and waxmyrtle are the dominant low-growing shrubs.

Wetness is a severe limitation for cultivated crops. The number of adapted crops is limited by wetness, which is moderately difficult to control. With adequate drainage, these soils are suited to several important crops. The water-control system should be designed to remove excess surface and internal water rapidly. Seedbeds should be prepared by bedding the rows. Crop rotations should keep the soil under close-growing, soil-improving crops at least two-thirds of the time. All crop residues and soil-improving crops should be left on the land. Fertilizers, applied according to the needs of the crops, and occasional liming are needed for maximum yields.

This soil is well suited to pasture and hay crops. Simple drainage measures are required to remove excess surface water during heavy rains. Coastal bermudagrass, improved bahiagrasses, and white clovers are well adapted. These grass and legume crops require fertilizing and liming. Controlled grazing is needed to prevent overgrazing and reduction of plant vigor.

This soil has high potential productivity for pine trees, but a water-control system is needed if the full potential is to be reached. Bedding or mounding of the rows is necessary. Equipment limitations and seedling mortality are the main management concerns. Loblolly and slash pine are the best species to plant.

The high water table is a severe limitation for recreational or urban development uses. Installation and maintenance of complex water-control systems, addition of fill material 3 feet or more thick, and installation of surface ditches to remove excess surface water are necessary for most recreational or urban development uses. The high water table severely limits the use of this soil as sites for sanitary landfills.

This soil is in capability subclass IIIw.

38—Pansey loamy sand. This poorly drained, nearly level soil occurs on broad flats and in poorly defined, low-gradient drainageways. Slopes are smooth to concave.

Typically, the surface layer is very dark gray loamy sand about 7 inches thick. The subsurface layer is light brownish gray loamy sand about 11 inches thick. The subsoil extends to a depth of more than 80 inches. The upper 8 inches is light gray sandy loam or sandy clay loam with a few light yellowish brown and yellowish brown mottles and common gray mottles. Below this is 36 inches of light gray sandy clay loam mottled in shades of yellow, brown, and red. The lower part of the subsoil is light gray sandy loam or sandy clay loam, reticulately mottled in shades of yellow, brown, and red.

Included with this soil in mapping are small areas of Alapaha, Albany, Leefield, Pelham, Plummer, and Pantego soils. Included soils make up less than 15 percent of any mapped area.

The water table is within a depth of 20 inches during wet seasons, usually winter, and water may stand on the surface of most areas for short periods after flooding. Permeability is moderately rapid in the surface and subsurface layers and is slow in most of the subsoil.

Available water capacity is moderate in the surface and subsurface layers and is high in the subsoil. Internal drainage is slow, impeded by a high water table. Natural fertility and organic matter content are moderate in the surface layer but are low in the other layers.

The natural vegetation is slash, loblolly, and longleaf pine and sweetgum, blackgum, water oak, red maple, and a few cypress in the depressional areas. The understory is inkberry, waxmyrtle, sawpalmetto, and abundant pineland threeawn. Most areas of this soil remain in woodland or cutover woodland. Some areas are planted to slash pine.

Wetness and low natural fertility are very severe limitations for cultivated crops. A good water-control system is needed before the soil can be made suitable for most crops. The water-control system should be designed to remove excess surface water during heavy rains as well as to remove excess internal water. Seedbed preparation should include bedding of the rows. Fertilizing, liming, and keeping a close-growing, soil-improving crop on the soil at least three-fourths of the time also are important. Crop residues should remain on the soil.

This soil is moderately well suited to pasture, especially to adapted grasses such as Coastal bermudagrass and bahiagrass. Surface drainage, fertilizers, and lime are needed. Grazing should be controlled to maintain plant vigor and high yields.

This soil has moderately high potential productivity for loblolly and slash pine, sweetgum, and water oak. Adequate water control is needed to achieve the potential.

Use of this soil as sites for urban development and recreational uses is severely limited. Water-control systems are needed for any type of development and especially for septic tank absorption fields for urban use.

This soil is in capability subclass IVw.

39—Pantego sandy loam. This very poorly drained, nearly level soil is in wet depressions and along poorly defined drainageways in the flatwoods and along moderately well defined drainageways in the uplands. Slopes are smooth to concave and range from 0 to 2 percent.

Typically, the surface layer is sandy loam about 18 inches thick. It is dominantly black or very dark gray. The upper part of the subsoil is dark gray sandy clay loam about 14 inches thick; the next layer is gray sandy clay loam to a depth of 80 inches.

Included with this soil in mapping are small areas of Alapaha, Albany, Dorovan, Leefield, Pamlico, Pansey, Pelham, Rains, and Rutlege soils. Also included in some depressional areas are larger areas of Alapaha, Dorovan, Pamlico, Pansey, and Rutlege soils that are too intricately mixed to map at the scale used. Also included in a few small areas are soils that have properties similar to those of this Pantego soil but have a clayey subsoil. In a few areas, the soils have a thicker dark surface layer than that described as typical. Included soils make up less than 20 percent of any mapped area.

This Pantego soil has a water table at a depth of less than 15 inches for 3 to 6 months during most years. Depressional areas are ponded for 1 to 3 months annually. Permeability is moderately rapid in the surface layer and is moderate in the subsoil. Internal drainage is slow, impeded by the high water table. Natural fertility and organic matter content are high to a depth of about 18 inches and are low below that depth. Available water capacity is high throughout the soil.

The natural vegetation is pond pine, tupelo-gum, sweetbay, willow oak, and cypress. The understory is buckwheattree, gallberry, reeds, waxmyrtle, and pineland threeawn. Most areas remain in woodland or cutover forest.

This soil in its natural state is unsuited to cultivated crops. With drainage or water-control systems, it is moderately suited to most adapted cultivated crops. The water-control system should provide a means of removing excess surface water rapidly after heavy rains and provide internal drainage to the upper soil layers. Seedbed preparation should include bedding or mounding of the rows. Regular applications of lime and fertilizers are needed. Crop rotations should keep close-growing, soil-improving crops on the land at least two-thirds of the time. Crop residues should be left on the surface.

This soil is well suited to pasture and hay crops when adequately drained and properly managed. Tall fescue, Coastal bermudagrass, bahiagrass, and white clover are well adapted and grow well under good management. Surface ditches are needed to remove surface water rapidly during heavy rains. Fertilizers and lime are needed. Grazing should be controlled to prevent overgrazing and to maintain vigorous plants.

This soil has very high potential productivity for pine trees. Trees respond well to good water-control systems. Bedding and mounding enable pine seedlings to get a vigorous start.

Use of this soil as sites for urban or recreational use is severely limited. The cost of adequate water-control systems is high. These systems are complex to plan and to use.

This soil is in capability subclass IIIw.

40—Arents, 0 to 5 percent slopes. Arents consist of manmade land mixed by earth-moving operations, including cutting, leveling, dredging, or filling activities or any combination of these operations. Slopes are smooth.

These soils consist of mixed soil material. This material is light gray, grayish brown, very pale brown, yellow, black, dark reddish brown, strong brown, or red sand, fine sand, loamy sand, sandy loam, or sandy clay loam. Sandy textures are dominant in most areas. The sandy loam or sandy clay loam part contains fragments, lumps, or layers of subsoil material. Fragments of organic humus are also present in some areas. Few areas of this soil have uniform horizons or an orderly sequence of horizons. Many areas of these soils were formed when small depressions or ponds were filled with available soil material to the surrounding ground level or to elevations above natural ground level. In some areas, surrounding higher ridges or elevations were cut down and the surplus material filled in the lower areas. Soil material used for fill material may have come from adjacent areas or from distant areas.

Included in mapping are very small areas of natural soils too small to map at the scale used. These included soils are Albany, Blanton, Chipley, Centenary, Foxworth, Kureb, Lakeland, Leon, Plummer, Pottsburg, Pamlico, Dorovan, and Rutlege soils. Also included are soils with deep sandy horizons that have been altered by manmade activities. Included areas make up as much as about 20 percent of any map area.

Depth to the water table is variable in these soils. Permeability is variable. Natural fertility is generally low. Organic matter content is variable. Available water capacity is variable.

These soils are moderately suited to improved pasture. In most areas, water-control measures are needed to remove excess water during wet periods. Low fertility limits use for pastures. Most areas of this unit were prepared for urban development and not for agricultural use.

Arents have not been assigned to a capability subclass.

41—Dirego muck. This level to nearly level, very poorly drained soil is in the tidal marshes. Slopes are smooth and range from 0 to 1 percent.

Typically, the surface layer is dark reddish brown muck about 28 inches thick. It is underlain by a mixture of very dark brown, gray, and dark gray mucky fine sandy loam, loamy fine sand, and fine sand that extends to a depth of 80 inches or more.

Included with this soil in mapping are small areas of Bayvi, Dorovan, Leon, Osier, Pamlico, Pickney, Pottsburg, and Rutlege soils. Also included are small areas of soils that are similar to this Dirego soil but have a surface layer less than 16 inches in thickness. Included soils make up less than 15 percent of any mapped area.

This Dirego soil has a water table at a depth of less than 10 inches, or the soil is ponded for 6 to 12 months during most years. This soil is subject to tidal flooding. Available water capacity is low. Permeability is rapid in all horizons. Internal drainage is very slow because of the high water table. Natural fertility is low, and organic matter content is very high.

The natural vegetation is dominantly needlegrass rush, cordgrass, and torpedograss.

This soil is unsuited to cultivated crops and improved pastures because of wetness, flooding, high salinity, excess organic matter, and high sulfur content. Overcoming these limitations is not practical.

The soil is unsuited to loblolly, slash, or longleaf pine. Saltwater retards growth of trees.

This soil is unsuited to urban development or recreational uses because it is inundated each day with tidewater.

This soil is in capability subclass VIIIw.

42—Resota fine sand, 0 to 5 percent slopes. This moderately well drained, nearly level to gently sloping, deep, sandy soil occurs on small to broad, slightly ridged areas near the Gulf of Mexico in the southern part of the county. Slopes are generally convex to smooth.

Typically, the surface layer is light brownish gray fine sand about 4 inches thick. The subsurface layer is light gray fine sand about 15 inches thick. The subsoil extends to a depth of more than 80 inches. The upper 8 inches is brownish yellow fine sand with lenses of darker colors. Next is 15 inches of yellow fine sand with brownish mottles. The lower layer is very pale brown fine sand that grades to white with increasing depth.

Included with this soil in mapping are small areas of Chipley, Foxworth, Kureb, Lakeland, Leon, and Mandarin soils. Included soils make up less than 10 percent of any mapped area.

This Resota soil has very low available water capacity. Permeability is very rapid. The water table fluctuates between depths of 40 and 60 inches in wet seasons and between 60 and more than 80 inches in dry seasons. Organic matter content and natural fertility are low.

The natural vegetation consists of sand pine, slash pine, longleaf pine, dwarf live oak, turkey oak, sawpalmetto, rosemary, and sparse pineland threeawn. Most areas remain in cutover woodland. Some areas near the coast have been cleared for urban development.

Droughtiness and rapid leaching of plant nutrients are very severe limitations for cultivated crops. Intensive soil management practices are required when this soil is cultivated. Row crops should be planted on the contour in strips alternating with strips of close-growing crops. Crop rotations should keep close-growing plants on the land at least three-fourths of the time. Soil-improving crops and all crop residues should be left on the land. Only a few crops produce good yields without irrigation. Irrigation is generally feasible where irrigation water is readily available.

This soil is moderately suited to pasture and hay crops. Deep-rooted plants such as bahiagrass are well adapted, but yields are reduced by periodic droughts. Regular fertilizing and liming are needed. Grazing should be controlled to permit plants to maintain vigor for maximum yields.

This soil has moderate potential productivity for pine trees. Seedling mortality and equipment limitations are the main management concerns. Sand pine is the best species to plant.

Use of this soil as sites for most urban and recreational developments is moderately to severely limited. Wetness is a moderate limitation to use of the soil as septic tank absorption fields. The sandy texture and low natural fertility limit use for playgrounds or other recreational uses. The hazard of cutbanks caving limits use for purposes that require shallow excavations. Shoring of sidewalls is necessary. The sandy texture, poor filtering ability, and very rapid permeability limit use of this soil as sites for trench and area sanitary landfills.

This soil is in capability subclass VIs.

43—Urban land. Urban land consists of areas that are 75 percent or more covered with streets, houses, commercial buildings, parking lots, shopping centers, industrial parks, airports, and related facilities.

Included in mapping are very small areas of Blanton, Chipley, Foxworth, Kureb, Lakeland, Leon, Pottsburg, and Rutlege soils. These included soils are mostly in lawns, parks, vacant lots, and playgrounds. Other areas are made up of undifferentiated soil material. All of the included soils are in tracts that are too small to be mapped separately.

This unit is not assigned to a capability subclass.

44—Beaches. Beaches are narrow strips of nearly level to gently sloping sand along the Gulf of Mexico. These areas are inundated with saltwater daily by high tide and wave action. This map unit is a mixture of quartz sand, heavy minerals (principally rutile and ilmenite), and fragments of seashells. The material is subject to movement by wind, tides, and waves and is bare of vegetation. The water table is above the surface or within 10 inches of the surface most of the time. The salt content of the ground water is high.

Included in mapping are very small knolls or ridges of coastal sand dunes. These areas are generally too small to map separately, are unstable and shifted by wind or water action, and make up less than 5 percent of the unit.

Beaches are used intensively for recreational activities. Because of their location, their value for recreational activities, and the daily flooding by saltwater, other uses are not practical or feasible.

45—Kureb sand, 0 to 5 percent slopes. This excessively drained, nearly level to sloping soil is on moderately broad upland areas near the coast in the southern part of the county. Slopes are smooth to convex.

Typically, the surface layer is grayish brown sand about 6 inches thick. The next layer is light gray sand about 8 inches thick over yellowish brown sand about 11 inches thick. Below that, brownish yellow sand about 50 inches thick overlies very pale brown sand that extends to a depth of 80 inches or more.

Included with this Kureb soil in mapping are small areas of Foxworth, Lakeland, Mandarin, Resota, Osier, and Rutlege soils. In a few areas, soils that are similar to this Kureb soil but have slopes of 5 to 12 percent are included on side slopes of ridges. Included soils make up less than 10 percent of any mapped area.

The natural vegetation consists of scattered longleaf and sand pine, dwarf live oak, turkey oak, and bluejack oak. The understory consists of sawpalmetto, rosemary, huckleberry, lichens, and sparse pineland threeawn. Most areas of this soil are still in woodland or are in urbanized areas along the gulf coast.

This soil has very low available water capacity. Permeability is rapid. Natural fertility and organic matter content are very low. The water table is below a depth of 80 inches throughout the year.

This soil is not suitable for cultivated field crops. It is poorly suited to pasture. Grasses such as Coastal bermudagrass and bahiagrass make only fair growth when fertilized. Clovers are not adapted.

This soil has low potential productivity for pine trees. Equipment limitations and seedling mortality are the main management concerns. Sand pines are the best trees to plant.

Use of this soil as sites for sanitary facilities and recreational uses is severely limited. The sandy texture throughout limits most recreational development unless complex conservation practices are used. The hazard of cutbanks caving limits use for purposes that require shallow excavations unless side slopes are immediately shored. Adding topsoil, nutrients, and water will help to overcome the limitations for recreational use.

This soil is in capability subclass VIIs.

46—Sapelo sand. This poorly drained, nearly level soil is in low flatwoods. Slopes are generally broad and smooth and range from 0 to 2 percent.

Typically, the surface layer is black sand about 6 inches thick. The subsurface layer is gray sand about 14 inches thick. The upper 7 inches of the subsoil is very dark grayish brown sand that is coated with organic matter. The next layer is 15 inches of pale brown sand over 16 inches of light gray sand. The lower part of the subsoil is brownish yellow sandy loam.

Included with this soil in mapping are small areas of Alapaha, Albany, Blanton, Chipley, Foxworth, Leefield, Leon, Pantego, Pelham, Plummer, and Rutlege soils. Also included is a soil that is similar to this Sapelo soil in most soil characteristics but that has a lighter surface layer and a more weakly developed upper part of the subsoil. Also included are a few small areas of soils that have a brown subsurface layer and do not have the dark upper layer of the subsoil. Included soils make up less than 15 percent of any mapped area.

This Sapelo soil has a water table within a depth of 10 to 30 inches for 2 to 4 months and within a depth of 40 inches for about 9 months in most years. Available water capacity is medium in both parts of the subsoil and is low to very low in the other layers. Permeability is moderate in both parts of the subsoil and is rapid in the other layers.

The natural vegetation consists of slash and longleaf pine; water, bluejack, and post oak; and an understory of waxmyrtle, southern inkberry, sawpalmetto, fetterbush, and pineland threeawn.

Wetness and low natural fertility are severe limitations for cultivated crops. The number of adapted crops is limited unless very intensive management practices are applied. Where adequate water-control measures and soil-improving measures are used, the soil is suited to a limited number of crops. The best-suited crops are vegetable crops. A complete water-control system is needed to remove excess water quickly after heavy rains and to supply subsurface irrigation in dry seasons. The crop rotation should keep soil-improving crops on the land at least three-fourths of the time. All crop residues and the soil-improving crops should be left on the land. Seedbed preparation should include bedding of the rows. Fertilizer and lime should be added according to the needs of the crops.

This soil is well suited to pasture and hay crops. Coastal bermudagrass, improved bahiagrasses, and several legumes are adapted. Water-control measures are needed to remove excess water during heavy rains. Regular applications of fertilizer and lime are needed. For maximum yields, grazing should be controlled to maintain vigorous plants.

This soil has moderately high potential productivity for pine trees. Equipment limitations and seedling mortality are the main management problems. Seedbed preparation should include bedding or mounding for seedling survival. Slash pines are the best species to plant.

The high water table is a severe limitation to use of this soil as a site for urban development uses. Installation and maintenance of complex water-control measures are necessary for most recreational or urban development uses. Adding fill material 2 to 4 feet high is necessary for most urban uses if other water-control measures are not used. The hazard of cutbanks caving and the high water table limit use of this soil for purposes that require shallow excavations. These soils are poorly suited to use as sites for both trench and area sanitary landfills. This sandy soil is unsuited to use as cover material.

This soil is in capability subclass IVw.

47—Pits. Pits are areas from which soil has been excavated for use in road construction and as fill material in preparing sites for buildings. The areas vary in size, shape, and depth. Most are relatively small; some, however, are as large as 30 to 40 acres. Depth is generally about 4 to 12 feet. Pits too small to map at the scale used are shown on the map by a pick and shovel symbol.

48—Fripp-Corolla complex, 2 to 30 percent slopes. This map unit is gently sloping to steep. It consists dominantly of excessively drained Fripp soils and moderately well drained to somewhat poorly drained Corolla soils in areas so intricately intermixed in the landscape that they could not be mapped separately at the scale selected. Fripp and Corolla soils are on undulating, dunelike areas adjacent to the Gulf of Mexico. The sloping to steep Fripp soils are on the upper two-thirds of the side slopes, and the gently sloping Corolla soils are on the lower one-third. These areas are subject to rare storm tide flooding.

The Fripp soils make up about 55 to 60 percent of the complex. Typically, the surface layer is gray sand about 3 inches thick. Below this to a depth of 80 inches or more is white sand that contains horizontal bands of black heavy minerals and lenses of gray sand.

Depth to the water table is more than 72 inches. Permeability is rapid. Available water capacity and organic matter content are very low.

The moderately well drained to somewhat poorly drained Corolla soils make up about 25 percent of the complex. Typically, the surface layer is dark gray sand about 3 inches thick. The next 12 inches is gray sand. The next 50 inches is white sand. The next 15 inches is light brownish gray sand. Horizontal bands of heavy black minerals are throughout the soil.

The water table is 20 to 60 inches below the soil surface for 1 month to 3 months during most years. Permeability is very rapid throughout. Available water capacity and organic matter content are very low.

Soils of minor extent make up the rest of the complex. Included are Bayvi, Dirego, Dorovan, Osier, Pamlico, and Rutlege soils. Also included in this unit are soils that are similar to Fripp sand but have a water table at a depth of 20 to 40 inches for 2 to 6 months during most years.

The natural vegetation is stunted sand pine, sea-oats, switchgrass, rosemary, reindeer lichen, scrub live oak, and palmetto.

The soils in this complex are not suitable for cultivated crops or for pasture.

The potential productivity of the complex for pine trees is moderate. Equipment limitations and seedling mortality are the main management concerns. Sand pines are the best species to plant.

Use of these soils for most urban and recreational development is severely limited because these areas are subject to rare storm tides. Water-control measures are necessary to lower the water table and maintain it at a proper depth if the soils are used as septic tank absorption fields. The hazard of cutbanks caving is severe if the soils are used for purposes that require shallow excavations. Shoring is necessary. Surface stabilization is necessary if the soils in this complex are developed for recreational uses.

The soils in this complex are in capability subclass VIIs.

50—Pickney fine sand. This very poorly drained soil is on nearly level, broad flats and slightly depressional areas along poorly defined drainageways. Slopes are smooth to concave and range from 0 to 1 percent.

Typically, the surface layer is black fine sand about 30 inches thick. Below that is dark gray fine sand about 16 inches thick. Below that to a depth of 80 inches or more is gray or light gray fine sand.

Included with this soil in mapping are small areas of Alapaha, Allanton, Dorovan, Leon, Osier, Pamlico, Pantego, Pelham, Pottsburg, and Rutlege soils. Also included in a few areas are soils that have properties similar to those of this Pickney soil but have layers, streaks, or lumps of loamy sand or sandy loam in the subsoil. Included soils make up less than 15 percent of any mapped area.

This Pickney soil has a water table at or near the surface for 4 to 6 months during most years. Most low-lying areas are ponded for 3 to 6 months after flooding during rainy seasons. Available water capacity is medium in the surface layer and is low below. Permeability is rapid. Internal drainage is very slow because it is impeded by the water table. Natural fertility is medium, and organic matter content is high in the surface layer.

The natural vegetation is sweetbay, blackgum, cypress, buckwheattree, and scattered slash and longleaf pine. The understory is gallberry, waxmyrtle, pineland threeawn, St.-Johnswort, and maidencane. Most areas of this soil are in cutover woodland or have been planted to slash pine. A few areas have been drained and planted to improved pasture.

Wetness is a very severe limitation for cultivated crops. Without intensive, complex water-control systems, the number of adapted crops is very limited. With adequate water control, such crops as corn and soybeans can be grown. The water-control system should provide a means of removing excess surface water rapidly after heavy rains and should provide rapid internal drainage to the upper layers. Seedbed preparation should include bedding or mounding of the rows. Regular applications of lime and fertilizer are needed. Crop rotations should keep close-growing, soil-improving crops on the land at least two-thirds of the time. All crop residues should be left on the land.

This soil is moderately well suited to pasture and hay crops when properly managed. Tall fescue, Coastal bermudagrass, bahiagrass, and white clovers are well adapted if adequate water-control systems are installed and maintained. Surface ditches are necessary to remove excess surface water rapidly during heavy rains. Fertilizers and lime are needed. Grazing should be controlled to prevent overgrazing and reduction of plant vitality.

This soil has very high potential productivity for slash and loblolly pine, sweetgum, and water tupelo if adequate water control systems are used. Under natural conditions, equipment limitations and seedling mortality are the main management concerns. Adequate water control is necessary before trees can be planted. Bedding or mounding is necessary for optimum seedling survival. Loblolly and slash pine are the best species to plant.

The use of this soil as sites for urban and recreational developments or uses are severely limited. The extremely high water table and flooding prohibit use as septic tank absorption fields. The hazard of cutbanks caving, flooding, and the high water table limit or prohibit shallow excavations. Intensive and complex water-control systems are necessary to use these soils as sites for either urban or recreational developments. The sandy texture, flooding, and the high water table prohibit the use of these soils as sites for sanitary landfills.

This soil is in capability subclass IVw.

51—Rutlege-Pamlico complex. This map unit consists of nearly level, very poorly drained, frequently flooded soils. Areas of these soils occur in an irregular pattern and are difficult to map separately at the scale used. The landscape is mainly one of drainageways. A few wide depressional areas are included. The Rutlege soils are commonly on the outer rim of areas and extend inward toward the center. The Pamlico and Pantego soils are in the lowest part of the areas. The areas are mostly long and moderately narrow and are about 30 to 500 acres. The depressional areas are about 10 to 300 acres. Individual areas of each soil range from about 5 to 50 acres.

The Rutlege soils make up about 35 percent of the complex. Typically, they have a black and very dark grayish brown loamy sand surface layer about 20 inches thick. Below this is gray loamy sand or sand to a depth of about 36 inches and then light gray or gray sand to a depth of 72 inches or more.

The Rutlege soils have a water table near the surface for 4 to 6 months in most years and may be ponded after flooding. Permeability is rapid throughout. Available water capacity is low. Internal drainage is slow because it is impeded by the high water table.

The Pamlico soils make up about 25 percent of the complex. Typically, they have a black muck surface layer about 30 inches thick. Below this is very dark grayish brown sand about 20 inches thick and then gray or light gray sand that extends to a depth of 72 inches or more.

The Pamlico soils may be ponded for 4 to 6 months in most years after flooding. Even when the soils are not flooded, a water table is within 20 inches of the surface most of the time. During dry seasons, usually late in fall, the water table may briefly recede to a depth of 40 inches or deeper. Pamlico soils are moderate in permeability and have high available water capacity.

The Pantego soils make up about 10 percent of the unit. Typically, they have a surface layer of very dark gray or black loamy sand about 18 inches thick. The subsoil is dark gray and gray sandy clay loam with mottles of brownish yellow and yellowish brown and extends to a depth of 72 inches or more.

The Pantego soils have a water table within 10 inches of the surface for 2 to 4 months during most years and at a depth of 40 inches for 3 to 6 months. They are moderate in permeability and have medium available water capacity.

Soils of minor extent make up about 30 percent of the unit. The most common are Albany, Allanton, Osier, Pelham, Plummer, and Pottsburg soils, which occur in about equal proportion. Not all of the minor soils occur in each mapped area. These minor soils generally are at the outer edges of the complex but may extend into the areas.

The natural vegetation consists of sweetbay, blackgum, red maple, sweetgum, slash pine, and an understory of buckwheattree, waxmyrtle, hammock, sweet azalea, gallberry, and smilax species (fig. 3). Most areas of this unit remain in native vegetation. There are a few cutover areas.

Figure 3.—Water-tolerant bay, gum, and cypress trees growing in an area of the Rutlege-Pamlico complex.

Wetness and flooding are severe limitations for cultivated crops. The number of adapted crops is very limited unless intensive water control measures are applied. Crops such as corn and soybeans can be grown if an adequate water control system is installed. The water control system should provide a means of removing excess surface water rapidly after heavy rains and should provide rapid internal drainage to the upper soil layers. Seedbed preparation should include bedding or mounding of the rows. Regular applications of lime and fertilizers are needed. Crop rotations should keep close-growing, soil-improving crops on the land at least two-thirds of the time. All crop residues and soil-improving crops should be left on the land.

All of these soils are well suited to pasture and hay crops when adequately drained and properly managed. Tall fescuegrass, Coastal bermudagrass, bahiagrasses, and white clover are well adapted and grow well under good management. Surface ditches are needed to remove excess surface water rapidly during heavy rains. Fertilizers and lime are needed. Grazing should be controlled to prevent overgrazing and to maintain vigorous plants and good cover.

The Pantego and Rutlege soils have high potential productivity for pine trees, but excess water must be removed before the potential can be reached. The Pamlico soils have moderate potential productivity for pine trees. To increase the rate of seedling survival, seedbed preparation should include bedding or mounding of the rows before planting.

The use of these soils as sites for recreational and urban development is severely limited because of the high water table and the hazard of frequent flooding in rainy seasons. Installation and maintenance of a very complex and intensive water-control system is necessary for these uses. Fill material 3 feet or more thick must be added if the soils are used as a site for any recreational or urban development. Surface ditches to remove excess surface water rapidly are required. Use of these soils as septic tank absorption fields is severely limited. These soils are unsuited to use as sanitary landfill sites.

The soils in this complex are in capability subclass VIw.

52—Bayvi loamy sand. This level or nearly level, very poorly drained soil is in the tidal marshes and is inundated daily by normal high tides. Slopes are smooth and range from 0 to 1 percent.

Typically, the surface layer is very dark gray sand or loamy sand about 28 inches thick. It is underlain by a mixture of dark gray and gray sand or loamy sand to a depth of 80 inches or more. Salt content is high in all layers.

Included with this soil in mapping are small areas of Hydraquents similar to this Bayvi soil. Also included are small areas of soils that have an organic surface layer more than 10 inches thick. Included soils make up less than 25 percent of any map area.

This Bayvi soil has a water table at a depth of less than 10 inches, or the soil is ponded for 6 to 12 months during most years. This soil is subject to tidal flooding. Available water capacity is low. Permeability is rapid or very rapid in all layers. Internal drainage is very slow because of the high water table. Natural fertility is low. Organic matter content is high in the surface layer and is low in the lower layers.

The natural vegetation is dominantly needlegrass rushes, cordgrass, and torpedograss.

This soil is unsuited to all agricultural uses. Wetness, flooding, and high salinity prohibit all uses except wildlife habitat.

This soil is in capability subclass VIIIw.

53—Ebro-Dorovan complex. This complex consists of nearly level, very poorly drained soils in irregular patterns too complex to map separately. The landscape is low, broad flood plains that are mostly hardwood swamps on the flood plains of the East River and Pine Log Creek.

The Ebro soils make up 40 to 60 percent of the complex. Typically, the surface layer is very dark grayish brown muck 6 inches thick over very dark gray to black muck that is about 40 percent mineral and is more than 60 inches thick.

The water table is at or near the surface for 8 to 10 months, and the soils are frequently flooded for long periods. Permeability is moderately slow and is impeded by the high water table. Available water capacity is high. Natural fertility and organic matter content are high. Response to drainage is moderate.

The Dorovan soils make up 30 to 50 percent of the complex. Typically, the surface layer is black muck to a depth of 60 inches underlain by very dark grayish brown sand that extends to a depth of 80 inches or more.

The Dorovan soils are ponded for 6 to 12 months in most years unless they are artificially drained. Even when these soils are not flooded, the water table is within 10 inches of the surface most of the time unless the soils are artificially drained. Only during the driest season, usually late in fall, is the water table lower. Permeability is moderate. Available water capacity is very high.

Soils of minor extent make up about 20 percent of the complex. Areas of Allanton, Pamlico, Pantego, Pickney, and Rutlege soils are intermixed and occur in small areas within the mapped areas. Small areas of Alapaha, Pansey, Pelham, Pottsburg, Plummer, and Rains soils occur along the outer borders of the map areas.

The natural vegetation is dominantly baldcypress, blackgum, and water tupelo in the wetter areas and red maple, sweetgum, redbay, sweetbay, and buckwheattree along the edges of the areas and on the tributaries. The understory consists of sedges, reeds, giant canes, and smilax.

Frequent flooding and ponding are very severe limitations for cultivated crops. In their natural condition, these soils are not suitable for cultivation, but with adequate water control, water management, and protection from flooding, they are moderately suited to most vegetable crops and soybean crops. The water-control system should provide for removing excess water when crops are on the land and for keeping the soils saturated when not in crops. Good fertilization practices are necessary for optimum growth. These acid soils need high applications of lime. Water-tolerant cover crops should be used when cultivated crops are not on the land.

Most improved grasses and clovers adapted to this area grow well on these soils if water control systems are used. Water-control systems should insure that the water table is maintained near the surface to prevent excessive oxidation of the organic surface layer. Grazing should be controlled to permit maximum growth and yields.

Because of excessive wetness, these soils are not suited to the production of slash and longleaf pine unless complex water-control systems are installed and maintained.

These soils are not suited to urban or recreational development. The high water table, flooding, subsidence of the organic material, and low strength of the soils prohibit these uses.

The soils in this complex are in capability subclass VIIw.

Use and Management of the Soils

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

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

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

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

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

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

Crops and Pasture

John D. Lawrence, conservation agronomist, Soil Conservation Service, helped prepare this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

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

Approximately 20,000 acres in the Bay County soil survey area was used for crops and pasture in 1976, according to the Census of Agriculture, Soil Conservation Service records, Bay County Extension Service estimates, and Florida Agricultural Statistics. Of this total, 7,000 acres was used for pasture; 12,000 acres for field crops, mainly corn, small grains, and soybeans; and 1,500 acres for special crops, mainly vegetables—snap beans, sweet corn, pepper, cucumbers, and smaller acreages of squash, eggplant, field peas, sod, nursery plants, and pecans.

The potential of the soils in Bay County for increased food production is moderately good. About 100,000 acres of potentially moderately good cropland is currently used as woodland. In addition to that acreage, some land that is presently used for woodland and pasture could be used for cropland if intensive conservation measures were installed to control soil blowing on sandy soils. In addition to the reserve capacity represented by this land, food production could be increased considerably by extending the latest crop production technology to all cropland in the county. This soil survey can greatly facilitate the application of such technology.

The acreage used as cropland, pasture, and woodland has gradually been decreasing as more and more land is used for urban development. In 1967 there was about 10,000 acres of urban and built-up land in the county. This acreage has been increasing about 15 percent per year for the past 10 years, according to estimates by the Northwest Florida Regional Planning Council. The use of this soil survey to help make land use decisions that will influence the future role of farming in the county is discussed in the section "General Soil Map Units."

Water erosion is a problem in about one-fifth of the cropland and pastureland in Bay County. Where the slope is more than 2 percent in the moderately well drained Stilson soils and the somewhat poorly drained Albany soils, erosion is a hazard.

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

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

Minimizing tillage and leaving crop residues on the surface help to increase infiltration and reduce the hazards of runoff and erosion. These practices can be adapted to most soils in the survey area. The use of no-tillage for corn and soybeans is effective in reducing erosion on sloping land and can be adapted to most soils in the survey area.

Contour tillage or terracing is not practical in the survey area because the soils are sandy and slopes are short and irregular. Stripcropping and diversions, which reduce the length of slopes, reduce runoff and erosion. These practices are most practical on deep, well drained soils that have regular slopes. Diversions and sod waterways, which reduce runoff and erosion, can be adapted to most soils in the survey area.

Wind erosion is a hazard on the sandy soils. Wind erosion can damage soils and tender crops in a few hours in open, unprotected areas if the winds are strong and the soil is dry and bare of vegetation and surface mulch. Maintaining plant cover and surface mulch minimizes wind erosion.

Wind erosion is damaging for several reasons. It reduces soil fertility by removing finer soil particles and organic matter; damages or destroys crops by sandblasting; spreads diseases, insects, and weed seeds; and creates health hazards and cleaning problems. Control of wind erosion minimizes duststorms and improves air quality for more healthful living conditions.

Field windbreaks of adapted trees and shrubs, such as Carolina cherry laurel, slash pine, southern redcedar, and Japanese privet, and strip crops of small grains are effective in reducing wind erosion and crop damage. Field windbreaks and strip crops are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The intervals depend on the erodibility of the soil and the susceptibility of the crop to damage from sandblasting.

Information on the design of erosion control practices for each kind of soil is contained in the "Water and Wind Erosion Control Handbook - Florida," which is available in local offices of the Soil Conservation Service.

Soil drainage is a major management need on about one-third of the acreage used for crops and pasture in Bay County. Some soils are naturally so wet that the production of crops common to the area is generally not practical. There are about 150,000 acres of poorly drained soils, such as the Alapaha, Allanton, Leon, Pansey, Pelham, Plummer, Pottsburg, Rains, and Sapelo soils, and very poorly drained soils, such as the Dorovan, Osier, Pamlico, Pantego, Pickney, and Rutlege soils. Unless artificially drained, some of the somewhat poorly drained soils are wet enough in the root zone of most crops during the wet seasons to cause damage during most years. Included in this category are Albany, Chipley, Hurricane, and Mandarin soils, which make up about 55,000 acres.

Unless artificially drained, some of the poorly drained soils are wet enough to cause some damage to pasture plants during the wet seasons. These soils also have low available water capacity and are droughty during dry periods. It is necessary to subsurface irrigate these soils for adequate pasture production. The very poorly drained soils are very wet during the rainy periods. Water stands on the surface of most areas, and the production of good quality pastures is not possible without artificial drainage.

The design of both surface drainage and subsurface irrigation systems varies with the kind of soil and the types of pastures. A combination of surface drainage and subsurface irrigation systems is needed on these poorly drained and very poorly drained soils for intensive pasture production.

Information on drainage and irrigation for each kind of soil is contained in the Technical Guide available in the local office of the Soil Conservation Service.

Soil fertility is naturally low in most soils in the survey area. Most of the soils have a sandy surface layer. Many have a loamy subsoil. In this category are the Alapaha, Albany, Blanton, Pansey, Pelham, Plummer, Rains, and Sapelo soils. The Chipley, Foxworth, Kureb, Lakeland, and Resota soils are sandy to a depth of 80 inches or more. The Allanton, Centenary, Hurricane, Leon, Mandarin, and Pottsburg soils have an organically stained subsoil below a sandy subsurface layer. Reaction is strongly acid to very strongly acid in the surface layer of most of the soils if the soils have never been limed. Applications of ground limestone are needed to raise the pH level sufficiently for good growth of crops. Nitrogen and potash and available phosphorus levels are naturally low in most of these soils. On all soils, additions of lime and fertilizer should be based on the results of soil tests, on the needs of the crops, and on the desired level of yields. The Cooperative Extension Service can help in determining the kinds and amounts of fertilizer and lime to apply.

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

Most soils in the survey area have a surface layer of sand or loamy sand that is generally light in color and low to moderate in organic matter content. The Allanton, Dorovan, Pamlico, Pantego, Pickney, Ebro, and Rutlege soils are exceptions. The Allanton, Pickney, and Rutlege soils have a dark surface layer and high organic matter content. The Dorovan, Ebro, Pamlico, and Pantego soils are organic or have an organic surface layer. Generally the structure of the surface layer of most soils in the survey area is weak. Intense rainfall on dry soils that are low in organic matter content causes the colloidal matter to cement, forming a slight crust. The crust is slightly hard when it is dry and is slightly impervious to water. Once the crust forms, it reduces infiltration and increases runoff. Regular additions of crop residues, manure, and other organic material help to improve soil structure and to reduce crusting.

Fall plowing is generally not a good practice in the county. About one-fourth of the cropland is sloping soils that are subject to damaging erosion if they are plowed in fall. Also, about three-fourths of the cropland soils are sandy and are subject to soil blowing.

Field crops grown in the survey area include corn, soybeans, and small grains. The acreage of grain sorghum, sunflowers, potatoes, and sugarcane could be increased if economic conditions were favorable. Rye is the common close-growing crop grown. Wheat, oats, and triticale could be grown.

Special crops grown commercially in the survey area include a small acreage of sweet corn, squash, eggplant, peas, beans, turnips, pecans, nursery crops, and sod. There is a potential to increase the production of nursery crops, sod, cabbage, turnips, mustard, and other vegetables if economic conditions were favorable.

The deep soils that have good natural drainage are especially well suited to many vegetables and small fruits. In the survey area, these are the Blanton, Bonifay, Stilson, and Troup soils on slopes of less than 8 percent. These soils make up about 20,000 acres. If irrigated, about 50,000 acres of Blanton, Bonifay, Centenary, Foxworth, Lakeland, and Troup soils that have slopes of less than 8 percent are very well suited to vegetables and small fruit. In addition, there are about 50,000 acres of Alapaha, Albany, Chipley, Hurricane, Pansey, Pelham, Rains, and Sapelo soils that, if adequately drained, are moderately well suited to vegetables and small fruits.

Most of the well drained and moderately well drained soils are suitable for orchards and nursery plants. In some areas, however, poor air drainage and frequent frost pockets may limit their suitability for early vegetables, small fruits, and orchards.

Most recent information and suggestions for growing special crops can be obtained from the local offices of the Cooperative Extension Service and the Soil Conservation Service.

Pastures in the survey area are used to produce forage for beef and dairy cattle. Beef cattle cow-calf operations are the major livestock systems. Bahiagrass and Coastal bermudagrass are the major pasture plants. Grass seeds could be harvested from these grasses for improved pasture plantings as well as for commercial purposes. Many cattlemen seed small grain on cropland and overseed ryegrass on pastures in the fall for winter and spring grazing. Excess grass is harvested from Coastal bermudagrass as hay during the summer months for feeding during the winter months. Peanut vines are harvested as hay after the peanuts have been harvested.

The well drained and moderately well drained Blanton, Bonifay, Centenary, Foxworth, Stilson, and Troup soils are well suited to bahiagrass and improved bermudagrass. With good management, hairy indigo and alyce clover can be grown during the summer and fall.

The somewhat poorly drained Albany, Chipley, and Hurricane soils are well suited to bahiagrass and improved bermudagrass and to legumes such as sweet clover if adequately limed and fertilized.

Alapaha, Pansey, Pelham, Pottsburg, Plummer, Rains, and Sapelo soils are well suited to bahiagrass pasture if drainage is provided in some areas. In some areas of these soils, subsurface irrigation is needed. Subsurface irrigation increases the length of the growing season and the total forage production. If these soils are adequately limed and fertilized, they are well suited to legumes such as white clover.

Pasture in many parts of the county is greatly depleted by continuous excessive grazing. Yields of pasture can be increased by adding lime and fertilizer, by including legumes in the cropping system, by irrigating, and by using other management practices. The amount and kind of pasture yields are related to the kind of soil. Proper management of pasture should be based on the relationship among soils, pasture plants, lime, fertilizer, and moisture.

Latest information and suggestions on growing pasture can be obtained from the local offices of the Cooperative Extension Service and the Soil Conservation Service.

Yields Per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

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

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

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

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops (*5*). Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor does it consider possible major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for woodland, and for engineering purposes.

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

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

Class I soils have few limitations that restrict their use.

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

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

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

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

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

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

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

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

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

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

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

Woodland Management and Productivity

Ralph J. Edenfield, county forester, Florida Division of Forestry, helped prepare this section.

Approximately 407,000 acres, or 85 percent of the total land area of Bay County, is woodland. The soils and the climate of the county are fairly good for growing timber. The major part of the forest land is Lakeland, Leon, Foxworth, Troup, Chipley, Pottsburg, Allanton, Pamlico, Dorovan, and Pickney soils (fig. 4). Commercial forest enterprises are located in the southern part of the county. The major part of the forest land is owned by several large companies. Approximately 25 percent of the remaining forest land is owned by smaller landowners.

Figure 4.—Slash pine on Leon sand. This poorly drained soil has moderate potential productivity for pines.

Slash pine and longleaf pine, the predominant species in the southern part of Bay County, make up about 60 percent of the forest. Sparse pine stands are being clearcut and planted to improved slash pine. Buckwheattree, waxmyrtle, and slash pine are the primary species in the wet flats and drainageways throughout the southern part of the county. Generally, narrow stands of slash pine grow along the borders of these wet areas. The sandhill belt, which runs east and west through the northern part of the county, is stocked with longleaf pine, bluejack oak, turkey oak, post oak, and scrub oak. Gradually, longleaf pine and oaks are being replaced with planted stands of Choctawhatchee sand pine. Laurel oak, water oak, magnolia, sweetbay, slash pine, waxmyrtle, buckwheattree, and blackgum grow in the drainageways throughout the northern part of the county. Live oak, Choctawhatchee sand pine, slash pine, and longleaf pine occur in scattered stands along the gulf coast. Laurel oak, water oak, slash pine, live oak, sweetgum, blackgum, and cypress grow along Econfina, Bear, Cedar, and Pine Log Creeks. These trees have very little market value.

Timber management varies from intensive thinning, clearcutting, and planting on corporate land to less intensive selective cutting and harvest on private land. Prescribed burning through most pine stands is important in reducing "rough" and in exposing mineral soils as a seedbed for natural reproduction. It also encourages grasses and forbs, which help to support various wildlife species, such as deer, turkey, and quail.

A pulp and paper mill and a chip-and-saw mill are located in Bay County. Two pulp and paper mills and two sawmills buy most of the timber sold by Bay County landowners.

More detailed information on woodland and forest management can be obtained at the local offices of the Florida Division of Forestry, the Soil Conservation

Service, the Florida Cooperative Extension Service, and the Agricultural Stabilization and Conservation Service.

Table 7 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination (woodland suitability) symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

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

In table 7, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

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

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

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

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

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

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

Recreation

The soils of the survey area are rated in table 8 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 8, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 8 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 11 and interpretations for dwellings without basements and for local roads and streets in table 10.

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

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

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

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

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

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

Wildlife is a valuable resource of Bay County. Urban development, primarily in the coastal areas, has been detrimental to wildlife habitat, but the less developed areas support a large variety and number of wildlife species. The large acreage in woodland over the northern half of the county provides valuable habitat.

Game species include white-tailed deer, squirrels, turkey, bobwhite quail, and waterfowl. Nongame species include raccoon, rabbit, armadillo, opossum, skunk, bobcat, gray fox, otter, and a variety of songbirds, wading birds, shore birds, woodpeckers, reptiles, and amphibians. A wide variety of fish species, both freshwater and saltwater, provide good fishing, especially in the bays and sounds. Largemouth bass, bluegill, redbreasted sunfish, and catfish are the primary freshwater species. Speckled trout, redfish, and mackerel are important saltwater species.

A number of endangered or threatened species occur in Bay County, ranging from the seldom-seen red cockaded woodpecker to more commonly known species such as the brown pelican. A complete list of such species and detailed information on range and habitat may be obtained from the local Soil Conservation Service office.

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

In table 9, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

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

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

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, soybeans, wheat, oats, 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, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are bahiagrass, lovegrass, Florida beggarweed, clover, and sesbania.

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

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, the available water capacity, and wetness. Examples of these plants are oak, palmetto, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are fire thorn, wild plum, 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, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, cordgrass, rushes, sedges, and reeds.

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

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

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include bobwhite quail, dove, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, deer, and bear.

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

Engineering

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

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. This 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 soils information is not site specific and does not eliminate the need for onsite investigation of the soils. Additional testing and analysis by personnel experienced in the design and construction of engineering works may be necessary.

State and local government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Any existing local ordinances and regulations must be considered in planning, in site selection, and in design.

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

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

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

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

Building Site Development

Table 10 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are 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 layer, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

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

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 11 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are 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 11 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

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

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

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

Table 11 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter in the soil profile is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 11 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented layer, a high water table, slope, and flooding affect both trench and area types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Additional onsite investigation is needed.

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

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

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 plant growth. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 12 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

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

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

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

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

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 12, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

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

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

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

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

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

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

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

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 13 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

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.

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

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

Engineering Index Properties

Table 14 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

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

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

Classification of the soils is determined according to the Unified soil classification system (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (*1*).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 20.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

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

The estimates of grain-size distribution, liquid limit, and plasticity index are 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 15 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

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

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

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

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

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

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C.

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

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

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

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

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

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

1. Sands, coarse sands, fine sands, and very fine sands. These soils are generally not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.

2. Loamy sands, loamy fine sands, and loamy very fine sands. These soils are very highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

3. Sandy loams, coarse sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

4L. Calcareous loamy soils that are less than 35 percent clay and more than 5 percent finely divided calcium carbonate. These soils are erodible. Crops can be grown if intensive measures to control wind erosion are used.

4. Clays, silty clays, clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control wind erosion are used.

5. Loamy soils that are less than 18 percent clay and less than 5 percent finely divided calcium carbonate and sandy clay loams and sandy clays that are less than 5 percent finely divided calcium carbonate. These soils are slightly erodible. Crops can be grown if measures to control wind erosion are used.

6. Loamy soils that are 18 to 35 percent clay and less than 5 percent finely divided calcium carbonate, except silty clay loams. These soils are very slightly erodible. Crops can easily be grown.

7. Silty clay loams that are less than 35 percent clay and less than 5 percent finely divided calcium carbonate. These soils are very slightly erodible. Crops can easily be grown.

8. Stony or gravelly soils and other soils not subject to wind erosion.

Organic matter is the plant and animal residue in the soil at various stages of decomposition.

In table 15, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

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

Soil and Water Features

Table 16 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

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

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands 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 16, some soils are assigned to two hydrologic 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 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 16 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, common, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *common* that it is likely under normal conditions; *occasional* that it occurs, on the average, no more than once in 2 years; and *frequent* that it occurs, on the average, more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; November-May, for example, means that flooding can occur during the period November through May.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

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

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 16 are the depth to the seasonal high water table; the kind of water table—that is, perched, artesian, 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 16.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. An *artesian* water table is under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Only saturated zones within a depth of about 6 feet are indicated. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Table 16 shows subsidence that results from desiccation and shrinkage and oxidation of organic material, following drainage. The table shows the expected initial subsidence and total subsidence, which is initial subsidence plus the slow sinking that occurs over a period of several years as a result of oxidation. Not shown in the table is subsidence caused by an imposed surface load or by the withdrawal of ground water throughout an extensive area as a result of lowering the water table.

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

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

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

Physical, Chemical, and Mineralogical Analyses of Selected Soils

Dr. V. W. Carlisle, Professor of Soil Science, Soil Science Department, University of Florida, prepared this section.

Physical, chemical, and mineralogical properties of representative pedons sampled in Bay County are presented in tables 17, 18, and 19. The analyses were conducted and coordinated by the Soil Characterization Laboratory at the University of Florida. Detailed profile descriptions of the soils analyzed are given in alphabetical order in the section "Classification of the Soils." Laboratory data and profile information for other soils in Bay County and soils in other counties in Florida are on file at the Soil Science Department, University of Florida.

Soils were sampled from pits at carefully selected locations that represent typical pedons. Samples were air-dried, crushed, and sieved through a 2-millimeter screen. Most analytical methods used are outlined in Soil Survey Investigations Report No. 1 (*6*).

Particle-size distribution, given in table 17, was determined using a modified pipette method with sodium hexametaphosphate as the dispersant. Hydraulic conductivity and bulk density were determined on undisturbed soil core samples. Water retention data were obtained from duplicate undisturbed soil cores placed in tempe pressure cells. Weight percentage of water retained at 100 centimeters water (1/10 bar) and 345 centimeters water (1/3 bar) were calculated from volumetric water percentages divided by bulk density.

Samples were oven-dried, ground to pass a 2-millimeter sieve, and the 15-bar water retention was determined.

Extractable bases, shown in table 18, were obtained by leaching soils with ammonium acetate buffered at pH 7.0. The content of sodium and potassium in the extract was determined by flame emission, and the content of calcium and magnesium was determined by atomic absorption spectrophotometry. Extractable acidity was determined by the barium chloride-triethanolamine method at pH 8.2. The sum of cations, which may be considered a measure of cation-exchange capacity, was calculated by adding the values for extractable bases and extractable acidity. Base saturation is the ratio of extractable bases to cation-exchange capacity expressed as a percentage. Organic carbon was determined by a modification of the Walkley-Black wet combustion method. Electrical conductivity was determined using a conductivity bridge on 1:1 soil-to-water mixtures. The pH measurements were made with a glass electrode using a soil-to-water ratio of 1:1; a 0.01 *M* calcium cloride solution in a 1:2 soil-to-solution ratio; and a 1 *N* potassium cloride solution in a 1:1 soil-to-solution ratio.

Aluminum, carbon, and iron were extracted from probable spodic horizons with 0.1 *M* sodium pyrophosphate. The percentages of aluminum and iron were determined by atomic absorption; and the percentage of extracted carbon, by the Walkley-Black wet combustion method. The percentages of iron and aluminum extractable in sodium dithionite-citrate were determined by atomic absorption spectrophotometry.

The mineralogy of the clay fraction was ascertained by X-ray diffraction. Peak heights at 18-angstrom, 14-angstrom, 7.2-angstrom, 4.83-angstrom, and 4.31-angstrom positions represent montmorillonite and interstratified expandibles, vermiculite or 14-angstrom intergrades, kaolinite, gibbsite, and quartz, respectively. Peaks were measured, summed, and normalized to give percentages of soil minerals identified in the X-ray diffractograms. These percentage values do not indicate absolute determined quantities of soil minerals but do represent the relative distribution of minerals in a particular mineral suite. Determining absolute percentages would require additional knowledge of particle size, crystallinity, unit structure substitution, and matrix problems.

The sandy nature of most Bay County soils (table 19) is readily apparent. All pedons sampled, with the exception of the Stilson soil, contained at least one horizon that is more than 90 percent sand. Chipley, Foxworth, Kureb, Lakeland, Leon, Mandarin, Osier, Pottsburg, and Resota soils are more than 90 percent sand to a depth of 2 meters or more. Only one horizon in the Allanton, Centenary, Hurricane, and Troup soils is less than 90 percent sand. Deep horizons of the Albany, Blanton, Stilson, and Troup soils contain the highest percentage of fine-textured materials. Only one horizon in the Stilson soil is more than 30 percent clay. The content of silt is 3 to 8 percent in most of the soils in the county. Silt content exceeds 8 percent, however, in one or more horizons of the Allanton, Bayvi, Centenary, Dirego, and Stilson soils and is less than 3 percent in most horizons of the Kureb, Lakeland, Osier, Resota, and Pottsburg soils. Fine sand dominates the sand fractions of Albany, Blanton, Chipley, Dirego, Foxworth, Kureb, Osier, Pottsburg, Resota, and Stilson soils. Horizons that are more than 50 percent fine sand occur in all these soils except the Albany and Stilson soils. Medium sand dominates the sand fractions of Allanton, Bayvi, Centenary, Hurricane, Lakeland, Lucy, Mandarin, and Troup soils. Horizons that are more than 50 percent medium sand occur in all of these soils except the Bayvi and Troup soils. Droughtiness is a common characteristic of sandy soils, particularly those that are moderately well drained, well drained, and excessively drained.

Hydraulic conductivity values are less than 15 centimeters per hour throughout the entire profiles of the Albany, Osier, and Stilson soils. Hydraulic conductivity values exceed 60 centimeters per hour in some horizons in the Centenary, Hurricane, Kureb, Lakeland, Mandarin, Resota, and Troup soils. Deep horizons with increased amounts of clay in the Blanton and Stilson soils have hydraulic conductivity values that are less than 1 centimeter per hour. Centenary, Hurricane, Leon, and Mandarin soils have spodic horizons that have higher hydraulic conductivity values than are usually recorded for spodic horizons in most Florida soils.

The available water capacity can be estimated from bulk density and water content data. Generally, excessively sandy soils that contain low amounts of organic matter retain low amounts of water. The Kureb, Mandarin, and Resota soils retain very low amounts of water throughout the profile. The surface horizons of the Osier and Pottsburg soils retain relatively large amounts of water.

Most Bay County soils contain a low amount of extractable bases (table 18). In the Bayvi and Dirego soils, all horizons have more than 7 milliequivalents extractable bases per 100 grams of soil. All horizons of all other soils sampled contain less than 1 milliequivalent of extractable bases per 100 grams of soil. Calcium is the dominant base in most soils; sodium, however, is by far the dominant base in the Bayvi and Dirego soils. Sodium is barely detectable in the Centenary, Chipley, Foxworth, Kureb, Lakeland, Mandarin, Resota, and Troup soils. Magnesium occurs in amounts exceeding 1 milliequivalent per 100 grams in the Bayvi and Dirego soils and in much lower but detectable amounts in all other soils. Most Bay County soils contain extremely low amounts of potassium; potassium is nondetectable in horizons of Albany, Allanton, Centenary, Chipley, Foxworth, Hurricane, Kureb, Lakeland, Leon, Mandarin, Osier, Pottsburg, and Resota soils. Cation-exchange capacity, as represented by the sum of cations, exceeds 7 milliequivalents per 100 grams in the surface horizon of the Bayvi and Dirego soils. The cation-exchange capacity also exceeds 7 milliequivalents per 100 grams in the spodic horizon of the Allanton, Hurricane, Leon, and Pottsburg soils. In soils with low cation-exchange capacity in the surface horizon, such as Centenary, Foxworth, and Mandarin soils, only small amounts of lime are required to significantly alter both the base status and the reaction in the upper horizons. Generally, soils with low values for extractable bases and cation-exchange capacity have low inherent soil fertility and soils with high values for extractable bases, high cation-exchange capacity, and high base saturation values are fertile.

The organic carbon content is less than 2 percent throughout all horizons of all soils sampled except the Dirego soil. Significant increases in organic carbon content occur in the spodic horizon of Allanton, Hurricane, Leon, and Pottsburg soils. Soil management practices that conserve and maintain the organic carbon in soils are highly desirable because organic carbon content is directly related to nutrient and water retention.

Electrical conductivity values are very low for most of the soils in Bay County. They exceed 0.1 millimhos per centimeter only in the Bayvi and Dirego soils, which occur near the Gulf of Mexico. The data indicate that, with the exception of the Bayvi and Dirego soils, the content of soluble salt in Bay County soils is insufficient to detrimentally affect the growth of salt-sensitive plants.

Reaction in water ranges between pH 4.5 and 6.0 for most soils in the county. Reaction values are slightly higher for one or two horizons in the Blanton, Chipley, Foxworth, and Resota soils, but none is above pH 6.8. Reaction values are lower than pH 4.5 in one or two horizons of Allanton, Bayvi, Osier, and Pottsburg soils and in all horizons of the Dirego soil. Reaction is generally 0.5 and 1.5 units lower in calcium chloride and potassium chloride solutions than in water. Maximum plant nutrient availability is usually attained when soil reaction is between pH 6.5 and 7.5.

The percentage of iron extractable in sodium pyrophosphate is 0.04 percent or less in the Bh horizons of Allanton, Centenary, Hurricane, Leon, Mandarin, and Pottsburg soils. In these soils, the ratio of pyrophosphate-extractable carbon and aluminum to clay is sufficient to meet the chemical criteria for a spodic horizon. The percentage of iron extractable in citrate-dithionite in argillic horizons of Ultisols ranges from 0.01 percent in the Stilson soil to 1.6 percent in the Troup soil. These values in spodic horizons of Spodosols range from 0.04 percent in the Leon and Pottsburg soils to 0.08 percent in the Centenary soil and the lower part of the Bh horizon of the Pottsburg soil. The percentage of aluminum extracted by citrate-dithionite ranges from 0.02 percent in the Bayvi soil to 0.37 percent in the Troup soil. The amounts of aluminum and iron in Bay County soils are not sufficient to detrimentally affect phosphorus availability.

The sand fraction (2.0-0.05 millimeters) is siliceous, with quartz overwhelmingly dominant in all pedons. Small amounts of heavy minerals occur in most horizons, with the greatest concentration in the very fine sand fraction. No weatherable minerals were observed in the soils tested. In table 19 crystalline mineral components of the clay fraction (less than 0.002 millimeter) are reported for selected horizons of the pedons sampled. The clay mineralogical suite is composed of montmorillonite, a 14-angstrom intergrade, kaolinite, gibbsite, and mica (illite). Montmorillonite is detectable in all soils sampled except the Albany, Allanton, Centenary, Hurricane, Leon, and Stilson pedons. The 14-angstrom intergrade minerals occur in all pedons and are dominant in most. Kaolinite occurs in all but the Centenary and Leon soils. Gibbsite, generally in small amounts, was detected in the Albany, Allanton, Foxworth, Stilson, and Troup soils. Mica was detected only in the C4 horizon of the Osier soil.

Montmorillonite, which occurs in relatively small amounts, is probably the least stable of the mineral components in the present environment. Montmorillonite appears to have been inherited by Bay County soils. Relatively large amounts of 14-angstrom intergrade minerals occur in all soils, and the general tendency for these minerals to decrease with increasing depth suggests that the 14-angstrom intergrade minerals are the most stable species in this weathering environment. The general tendency for kaolinite to increase with increasing depth indicates that kaolinite is less stable than the 14-angstrom intergrades in the severe weathering environment near the surface. The inconsistent occurrence of gibbsite suggests it is inherited. Clay-sized quartz has resulted from decrements of the silt fraction. As is usual for most Florida soils, mica (illite) does not occur in detectable amounts in most soils.

Engineering Index Test Data

Table 20 presents engineering test data for some major soil series in Bay County. The tests were made by the Soils Laboratory, Florida Department of Transportation, Bureau of Materials and Research. They were made to help evaluate the soils for engineering purposes. The classifications given are based on data obtained by mechanical analyses and by tests to determine liquid limit and plastic limit.

The mechanical analyses were made by combined sieve and hydrometer methods. The various grain-sized fractions were calculated on the basis of all the material in the soil sample, including that coarser than 2 millimeters in diameter. The mechanical analyses used in this method should not be used in naming textural classes of soils.

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 as moisture content increases. 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.

The 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 clayey soil is increased from a dry state, the material changes from a semisolid to a plastic state. If the moisture content is further increased, the material changes from a plastic to a liquid state. The plastic limit is the moisture content at which the soil material changes from a semisolid to a plastic state, and the liquid limit is the moisture content at which the soil material changes from a plastic 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 a soil material is plastic. The data on liquid limit and plasticity index in this table are based on laboratory tests of soil samples.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*7*). 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 21 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Entisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquent (*Aqu*, meaning water, plus *ent*, from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Psammaquents (*Psamm*, meaning sand, plus *aquent*, the suborder of the Entisols that have an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Psammaquents.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is siliceous, thermic Typic Psammaquents.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

Soil Series and 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 (*4*). Many of the technical terms used in the descriptions are defined in Soil Taxonomy (*7*). 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."

Alapaha Series

The Alapaha series is a member of the loamy, siliceous, thermic family of Arenic Plinthic Paleaquults. It consists of deep, poorly drained, moderately slowly permeable soils that formed in sandy and loamy marine sediment. These soils are on nearly level flats and shallow depressional areas along poorly defined drainageways. They have a water table within 15 inches of the soil surface for 3 to 6 months in most years. Slopes are 2 percent or less.

Alapaha soils are near Albany, Chipley, Foxworth, Leefield, Pansey, and Hurricane soils. Alapaha soils are more poorly drained than Albany, Chipley, Foxworth, Leefield, and Hurricane soils. Albany soils have an A horizon 40 to 80 inches thick. Chipley and Foxworth soils are sandy to a depth of 80 inches or more. Pansey soils have a fine-loamy argillic horizon within 20 inches of the surface. Hurricane soils have a deep spodic horizon.

Typical pedon of Alapaha loamy sand in a wooded area approximately 300 yards south of Pine Log Creek bridge, 100 feet east of Highway 79, NE1/4SW1/4 sec. 8, T. 1 S., R. 16 W.

A1—0 to 6 inches; very dark gray (10YR 3/1) loamy sand; weak medium granular structure; very friable; many fine and medium roots; strongly acid; clear smooth boundary.

A21—6 to 14 inches; dark gray (10YR 4/1) loamy sand; weak medium granular structure; very friable; common fine and few medium roots; strongly acid; clear wavy boundary.

A22—14 to 32 inches; gray (10YR 6/1) loamy sand; weak medium granular structure; very friable; few fine and medium roots; many uncoated sand grains; strongly acid; gradual wavy boundary.

B21tg—32 to 50 inches; light gray (10YR 7/2) sandy clay loam; few medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; strongly acid; gradual wavy boundary.

B22tg—50 to 64 inches; light gray (10YR 7/1) sandy clay loam; common medium distinct brownish yellow (10YR 6/6) and yellowish brown (10YR 5/4) and common medium prominent dark red (2.5YR 3/6) mottles; moderate medium subangular blocky structure; friable; approximately 18 percent plinthite by volume; strongly acid; gradual wavy boundary.

B23tg—64 to 80 inches; light gray (10YR 6/1) sandy clay loam; many coarse distinct dark red (2.5YR 4/6) and common medium distinct brownish yellow (10YR 6/6) mottles; strongly acid; clear wavy boundary.

Reaction is strongly acid or very strongly acid in all horizons unless the soil has been limed. The content of strongly cemented ironstone nodules is greater than 5 percent by volume throughout the argillic horizon.

The A1 or Ap horizon ranges from 4 to 6 inches in thickness. It has hue of 10YR, value of 2 through 4, and chroma of 1, or it is neutral and has value of 2 through 4. The A2 horizon has hue of 10YR, value of 4 through 6, and chroma of 1. Thickness of the A horizon is generally about 32 inches but ranges from 20 to 40 inches.

The B21tg horizon has hue of 10YR, value of 5 through 7, and chroma of 1 or 2 or is neutral and has value of 5 through 7. Texture is sandy loam or sandy clay loam. The B22tg and B23tg horizons have hue of 10YR to 2.5Y, value of 5 to 7, and chroma of 1 or 2, or they are neutral and have value of 5 to 7. Texture is sandy clay loam. Few to many mottles of yellow, brown, gray, and red are in the Bt horizon. Plinthite content ranges from 10 to 30 percent.

Albany Series

The Albany series is a member of the loamy, siliceous, thermic family of Grossarenic Paleudults. It consists of somewhat poorly drained, moderately permeable soils. These nearly level and gently sloping soils are on uplands (fig. 5). They formed in thick deposits of sandy and loamy material. They occur in small areas, generally on low elevations, throughout the county. Slopes range from 0 to 5 percent. Most areas are dissected by defined drainage patterns. A water table is at a depth of 18 to 30 inches for 1 month to 3 months in most years.

Albany soils are near Alapaha, Blanton, Chipley, Foxworth, Hurricane, Lakeland, Leefield, and Stilson soils. Albany soils are more poorly drained than Blanton, Foxworth, and Lakeland soils. Chipley, Foxworth, and Lakeland soils are sandy to a depth of 80 inches or more. Alapaha, Leefield, and Stilson soils have an argillic horizon at a depth of 20 to 40 inches and have more than 5 percent plinthite within 60 inches of the surface. Stilson soils are better drained than Albany soils, and Alapaha soils are more poorly drained.

Typical pedon of Albany sand, 0 to 2 percent slopes, in a cultivated field approximately 14 miles southeast of Panama City, about 1-1/2 miles east of County Road 167, SE1/4NW1/4 sec. 29, T. 4 S., R. 12 W.

Ap—0 to 8 inches; grayish brown (10YR 5/2) sand; single grained; loose; medium organic matter content; strongly acid; abrupt smooth boundary.

A21—8 to 24 inches; light yellowish brown (10YR 6/4) sand; few fine faint light gray and brownish yellow mottles; single grained; loose; few uncoated sand grains; strongly acid; clear wavy boundary.

A22—24 to 46 inches; pale brown (10YR 6/3) sand; common medium distinct light gray (10YR 7/2) and brownish yellow (10YR 6/6) mottles; single grained; loose; common uncoated sand grains; strongly acid; gradual wavy boundary.

A23—46 to 54 inches; light gray (10YR 7/2) sand; common medium distinct pale brown (10YR 6/3) and yellowish brown (10YR 5/8) mottles; single grained; loose; many uncoated sand grains; strongly acid; gradual wavy boundary.

B21t—54 to 60 inches; light yellowish brown (10YR 6/4) sandy loam; common medium distinct light gray (10YR 7/2), yellowish brown (10YR 5/6), and strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; very friable; few sand lenses or streaks; strongly acid; clear smooth boundary.

B22t—60 to 80 inches; very pale brown (10YR 7/3) sandy clay loam; common medium distinct light gray

Figure 5.—A centipede grass sod farm on Albany sand, 0 to 2 percent slopes.

(10YR 7/2), yellowish brown (10YR 5/6), light yellowish brown (10YR 6/4), brownish yellow (10YR 6/6), and yellow (10YR 8/6) mottles; moderate medium subangular blocky structure; friable; few sand pockets; few to common uncoated sand grains; strongly acid.

Reaction is strongly acid or very strongly acid in all horizons unless the soil has been limed. The solum thickness exceeds 80 inches.

The A1 or Ap horizon has hue of 10YR, value of 3 through 5, and chroma of 1 or 2. The A1 or Ap horizon is 4 to 8 inches thick. The A2 horizon has hue of 10YR and value of 6 and chroma of 2 to 6 or value of 7 and chroma of 2 to 4 or has hue of 2.5Y and value of 5 and chroma of 2 or value of 6 or 7 and chroma of 2 or 4. The A2 horizon has few to common faint to distinct mottles of gray, yellow, or brown. Thickness of the A2 horizon ranges from 36 to 56 inches. Texture of the A horizon is dominantly sand but ranges from sand to loamy sand.

The B21t horizon has hue of 2.5Y, value of 5 or 6, and chroma of 4 or 6 or hue of 10YR, value of 6, and chroma of 4 or 6. This horizon has few to common mottles in shades of gray and yellow. Thickness ranges from 6 to 12 inches. The B22t horizon has hue of 10YR, value of 5 to 7, and chroma of 3 through 8 or has hue of 2.5Y and value of 6 and chroma of 4 or value of 7 and chroma of 3 to 8 with common to many mottles of red, brown, yellow, and gray. Texture of the Bt horizon is sandy loam or sandy clay loam.

Allanton Series

The Allanton series is a member of the sandy, siliceous, thermic family of Grossarenic Haplaquods. It consists of poorly drained, moderately rapidly permeable soils that formed in sandy marine deposits. These soils are in nearly level areas or slightly depressional areas along poorly defined drainageways. Slopes are smooth to concave and are less than 2 percent. The water table is at or near the surface for 4 to 6 months annually. Many of the lower lying areas are frequently flooded or are ponded for extended periods.

Allanton soils are near Chipley, Dorovan, Leon, Pamlico, Pickney, Pottsburg, Hurricane, and Rutlege soils. Chipley, Pickney, and Rutlege soils do not have a spodic horizon. Dorovan and Pamlico soils are organic. The somewhat poorly drained Hurricane soils are better drained than Allanton soils and do not have an umbric epipedon. Pottsburg soils do not have an umbric epipedon. Leon soils have a spodic horizon at a depth of 30 inches or less and do not have an umbric epipedon.

Typical pedon of Allanton sand in a cutover woodland area approximately 3 miles west of Fountain and U.S. Highway 231, about 30 feet south of dirt road, NW1/4SW1/4 sec. 20, T. 1 N., R. 12 W.

A11—0 to 10 inches; black (10YR 2/1) sand; weak fine granular structure; very friable; many medium and fine roots; many uncoated sand grains; very strongly acid; clear smooth boundary.

A12—10 to 18 inches; very dark gray (10YR 3/1) sand; single grained; loose; common uncoated sand grains; common fine and medium roots; very strongly acid; clear wavy boundary.

A21—18 to 27 inches; dark gray (10YR 4/1) sand with streaks and splotches of gray (10YR 5/1); single grained; loose; few medium roots; common uncoated sand grains; very strongly acid; gradual wavy boundary.

A22—27 to 52 inches; light gray (10YR 7/1) sand; single grained; loose; few fine roots; very strongly acid; clear smooth boundary.

B1h—52 to 56 inches; very dark gray (10YR 3/1) sand; single grained; loose; approximately 50 percent of sand grains coated with organic matter; very strongly acid; clear wavy boundary.

B2h—56 to 80 inches; black (N 2/0) sand; massive, crushes to weak fine granular structure; loose; all sand grains coated with organic matter; extremely acid.

Solum thickness exceeds 80 inches. Reaction is very strongly acid or strongly acid in the A horizon and extremely acid to strongly acid in the B horizon.

The A1 horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 or 2, or it is neutral and has value of 2 or 3. The thickness of the A1 horizon is greater than 10 inches. The texture is sand, fine sand, loamy sand, or loamy fine sand. The A2 horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2. The texture is sand or fine sand.

The B1h horizon has hue of 10YR or 7.5YR, value of 2 to 5, and chroma of 1 or 2. From 30 to 60 percent of the sand grains are coated with organic matter. Texture is sand, fine sand, or loamy sand. The B2h horizon has hue of 10YR, 7.5YR, or 5YR, value of 2 or 3, and chroma of 1 or 2, or it is neutral and has value of 2 or 3. The texture is sand or fine sand. Virtually, all sand grains are coated with organic matter.

Bayvi Series

The Bayvi series is a member of the sandy, siliceous, thermic family of Cumulic Haplaquolls. It consists of very poorly drained, rapidly permeable soils that formed in sandy marine sediment and some nonwoody halophytic plant remains. These level to nearly level soils are on broad flats and tidal marshes. Slopes range from 0 to 1 percent. Under natural conditions, the water table is at a depth of less than 10 inches, or the soil is covered (flooded) with saltwater for 6 to 12 months during most years. These soils are subject to tidal flooding.

Bayvi soils are near Dirego, Dorovan, Leon, Osier, Pamlico, Pickney, Pottsburg, and Rutlege soils. Dirego soils have a surface layer of organic muck more than 16 inches thick and are sulfidic. None of the associated soils are subject to tidal flooding.

Typical pedon of Bayvi loamy sand in a tidal marsh at the south end of Kimbrel Avenue in Calloway, Florida, SW1/4SE1/4 sec. 19, T. 4 S., R. 13 W.

A11—0 to 8 inches; very dark gray (10YR 3/1) loamy sand with splotches of dark gray (10YR 4/1); massive; friable; slightly sticky; common fine and few medium roots; slight sulfur odor; neutral wet, very strongly acid dry; gradual smooth boundary.

A12—8 to 28 inches; very dark gray (10YR 3/1) sand with splotches of gray (10YR 5/1); massive; friable; slightly sticky; few fine and medium roots; slight sulfur odor; neutral wet, very strongly acid dry; gradual smooth boundary.

C1—28 to 48 inches; dark gray (10YR 4/1) loamy sand with splotches of gray (10YR 5/1); massive; loose; slightly sticky; very slight sulfur odor; extremely acid dry; gradual wavy boundary.

C2—48 to 65 inches; light gray (10YR 6/1) loamy sand with streaks of gray (10YR 5/1); weak medium granular structure; slightly sticky; extremely acid dry; gradual wavy boundary.

C3—65 to 80 inches; gray (10YR 6/1) sand; single grained; loose; extremely acid.

Reaction ranges from slightly acid to neutral throughout the profile in its natural state. After air-drying, the pH decreases to strongly acid or extremely acid.

Sulfur content is low within a depth of 28 inches. A slight odor is detected when the soil is first exposed to air but dissipates rapidly. Some decomposed hemic plant materials may be in the A1 and A2 horizons.

The A1 horizon has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 1 or 2, or it is neutral and has value of 2 to 4. The texture is loamy sand or sand. The C horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2. The texture is sand or loamy sand.

Blanton Series

The Blanton series is a member of the loamy, siliceous, thermic family of Grossarenic Paleudults. It consists of deep, moderately well drained, moderately permeable soils that formed in thick deposits of sandy marine sediment. These nearly level to sloping soils are in the uplands. During wet seasons, they have a perched water table above the argillic horizon for less than 1 month during most years. Slopes range from 0 to 8 percent.

Blanton soils are near the Albany, Bonifay, Chipley, Foxworth, Lakeland, Stilson, and Troup soils. Blanton soils are better drained than the Albany soils and do not have chroma 2 mottles in the upper part of the Bt horizon. Blanton and Albany soils occur on similar landscape positions. Blanton soils differ from the Bonifay soils in that they have less than 5 percent plinthite within 60 inches of the surface and occur on slightly lower, broad flats rather than on more rolling uplands. Blanton soils have a Bt horizon within a depth of 40 to 80 inches, whereas Chipley, Foxworth, and Lakeland soils are sandy to a depth of more than 80 inches. All occur on similar landscape positions. Stilson soils have an argillic horizon within a depth of 20 to 40 inches and are more than 5 percent plinthite within a depth of 60 inches. Troup soils are better drained than Blanton soils; occur on higher, rolling upland landscapes; and usually have a reddish subsoil.

Typical pedon of Blanton fine sand, 0 to 5 percent slopes, planted to slash pine, approximately 2 miles northeast of Youngstown, Florida, approximately 1 mile east of U.S. Highway 231 on right side of dirt road, SW1/4NE1/4 sec. 15, T. 1 S., R. 12 W.

A1—0 to 4 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; common fine and medium roots; strongly acid; clear smooth boundary.

A21—4 to 20 inches; pale brown (10YR 6/3) fine sand; few grayish brown (10YR 5/2) stains along root channels; single grained; loose; common fine and medium roots; strongly acid; clear smooth boundary.

A22—20 to 47 inches; light yellowish brown (10YR 6/4) fine sand; single gained; loose; few to common uncoated sand grains; few fine and medium roots; strongly acid; clear wavy boundary.

A23—47 to 60 inches; yellow (10YR 7/6) fine sand; single grained; loose; many uncoated sand grains; strongly acid; clear wavy boundary.

B21t—60 to 63 inches; yellowish brown (10YR 5/6) fine sandy loam; moderate fine granular structure; very friable; strongly acid; clear wavy boundary.

B22t—63 to 80 inches; brownish yellow (10YR 6/6) fine sandy loam with few medium distinct pale brown (10YR 6/3) and light gray (10YR 7/2) mottles; weak medium subangular blocky structure; friable; neutral.

The solum thickness is more than 60 inches. Reaction ranges from very strongly acid to medium acid in the A horizon, except where limed, and strongly acid through neutral in the B horizon.

The Ap or A1 horizon has hue of 10YR and has value of 3 and chroma of 2, value of 4 or 5 and chroma of 1 to 3, or value of 6 and chroma of 1. It ranges from 2 to 10 inches in thickness. The A21 and A22 horizons have hue of 10YR and have value of 5 and chroma of 4 through 6, value of 6 and chroma of 1 through 4, or value of 7 and chroma of 1 through 8. The A23 horizon, where present, has hue of 10YR and has value of 7 or 8 and chroma of 1 to 8 or value of 6 and chroma of 3 to 8. Uncoated sand grains range from few in the A21 and A22 horizons to many in the A23 horizon. In some pedons, horizontal, discontinuous lamellae and small pockets of lamellae occur in the lower part of the A23 horizon. Total thickness of the A horizon ranges from 40 to 70 inches but is commonly 54 to 68 inches.

The B21t horizon has hue of 10YR and has value of 5 and chroma of 6 or 8 or value of 6 or 7 and chroma of 3 or 4, or has hue of 7.5YR, value of 5, and chroma of 6 or 8. Thickness ranges from 3 to 12 inches. The B22t horizon has hue of 10YR and has value of 5 and chroma of 6 or 8 or value of 6 and chroma of 3 to 8, or has hue of 2.5Y, value of 6, and chroma of 4 with few to common mottles in shades of brown, yellow, gray, or red. The texture of the B2t horizon is fine sandy loam or sandy clay loam. Some pedons have up to 5 percent plinthite between depths of 60 and 80 inches.

Bonifay Series

The Bonifay series is a member of the loamy, siliceous, thermic family of Grossarenic Plinthic Paleudults. It consists of well drained, moderately slowly permeable, nearly level to sloping upland soils that formed in thick beds of sandy and loamy material. The water table is at a depth of more than 72 inches. Slopes range from 0 to 8 percent.

Bonifay soils are near the Albany, Blanton, Foxworth, Lakeland, Stilson, and Troup soils. Bonifay soils have more than 5 percent plinthite within a depth of 60 inches; however, the Albany, Blanton, and Troup soils do not contain plinthite. In addition, Bonifay soils are well drained, whereas Albany soils are somewhat poorly drained and Blanton soils are moderately well drained. Bonifay soils have a loamy Bt horizon at a depth of less than 60 inches, whereas Foxworth and Lakeland soils are sandy to a depth of more than 80 inches. Stilson soils have a loamy Bt horizon within a depth of 20 to 40 inches and are moderately well drained.

Typical pedon of Bonifay sand, 0 to 5 percent slopes, approximately 6 miles north of Fountain, 3 miles west of U.S. Highway 231, NE1/4SW1/4 sec. 21, T. 2 N., R. 12 W.

Ap—0 to 7 inches; brown (10YR 5/3) sand; single grained; loose; many fine roots; strongly acid; clear smooth boundary.

A21—7 to 34 inches; light yellowish brown (10YR 6/4) sand; few fine faint pale brown mottles; single grained; loose; common fine roots; few medium roots; strongly acid; clear smooth boundary.

A22—34 to 54 inches; very pale brown (10YR 7/3) sand; few medium distinct yellowish brown (10YR 5/8) and brownish yellow (10YR 6/6) mottles; single grained; loose; few fine roots; few nodules of sandy loam; few plinthite nodules; common uncoated sand grains; strongly acid; clear wavy boundary.

B21t—54 to 58 inches; light yellowish brown (10YR 6/4) sandy loam; common medium distinct yellowish brown (10YR 5/6), strong brown (7.5YR 5/8), yellowish red (5YR 5/6), and red (2.5YR 4/6) mottles; weak medium subangular blocky structure; very friable; many uncoated sand grains; few plinthite nodules; few iron concretions; strongly acid; clean smooth boundary.

B22t—58 to 64 inches; light yellowish brown (10YR 6/4) sandy clay loam; common medium distinct yellowish brown (10YR 5/8), light gray (10YR 7/2), and red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; friable; estimated 10 to 15 percent plinthite; strongly acid; gradual wavy boundary.

B23t—64 to 80 inches; light yellowish brown (10YR 6/4) sandy clay loam; common medium distinct yellowish brown (10YR 5/8) and yellowish red (5YR 5/6) mottles and common coarse distinct light gray (10YR 7/2) and red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; friable; streaks of hard (indurated) plinthite or iron concretions; more than 15 percent plinthite; strongly acid.

Solum thickness ranges from 60 to more than 80 inches. Unless the soil has been limed, reaction is strongly acid or very strongly acid in all horizons. In some pedons, a few small iron oxide pebbles occur throughout the soil.

Total thickness of the A horizon is 40 to 60 inches but is most commonly 40 to 56 inches. The A1 or Ap horizon has hue of 10YR and has value of 3 and chroma of 2, value of 4 or 5 and chroma of 1 to 3, or value of 6 and chroma of 1. The thickness ranges from 3 to 8 inches. The A2 horizon has hue of 10YR and has value of 5 and chroma of 3 to 8, value of 6 and chroma of 4 to 8, or value of 7 and chroma of 3 or 4. Uncoated sand grains range from few in the upper part to many in the lower part and are light gray or white.

The B2t horizon has hue of 10YR, value of 5 or 6, and chroma of 4 through 8 and is mottled in shades of yellow, gray, brown, and red. The texture of the B2t horizon is dominantly sandy clay loam but ranges to sandy loam. In the Bt horizon of many pedons, there are few iron oxide pebbles and the content of plinthite ranges from 5 to 25 percent. In a few pedons, indurated plinthite or streaks or thin layers of hard iron oxide occur at a depth of 60 to 80 inches.

Centenary Series

The Centenary series is a member of the sandy, siliceous, thermic family of Grossarenic Entic Haplohumods. It consists of moderately well drained, moderately or moderately rapidly permeable soils that formed in thick beds of sandy marine sediment. These nearly level soils are on slightly undulating uplands. Slopes range from 0 to 5 percent. A water table fluctuates between depths of 40 and 60 inches for 1 month to 3 months during most years and between depths of 30 and 40 inches for less than 30 cumulative days in some years.

Centenary soils are near Albany, Blanton, Chipley, Foxworth, Lakeland, Hurricane, and Troup soils. Albany, Blanton, and Troup soils all have an argillic horizon within 80 inches of the surface. Chipley soils are more poorly drained than Centenary soils and do not have a spodic horizon. Foxworth soils are similar to Centenary soils in most properties but do not have a spodic horizon. Hurricane soils are similar to Centenary soils in most soil properties but are more poorly drained. Lakeland soils are excessively drained and do not have a spodic horizon.

Typical pedon of Centenary sand, 0 to 5 percent slopes, in a planted slash pine plantation about 3-1/2 miles north of Fountain, approximately 1/4 mile east of U.S. Highway 231, just west of St. Andrews and Bay Line Railroad on north edge of pine plantation, NE1/4SE1/4 sec. 2, T. 1 N., R. 12 W.

Ap—0 to 9 inches; brown (10YR 5/3) sand; single grained; loose; few to common fine and medium roots; strongly acid; abrupt smooth boundary.

A21—9 to 31 inches; brownish yellow (10YR 6/6) sand; single grained; loose; common fine roots; few krotovinas about 3 inches in diameter filled with brown, yellow, and very pale brown sand; few uncoated sand grains; medium acid; clear smooth boundary.

A22—31 to 49 inches; very pale brown (10YR 8/4) sand; single grained; loose; common fine roots; common uncoated sand grains; medium acid; clear wavy boundary.

A23—49 to 73 inches; white (10YR 8/2) sand; single grained; loose; few fine roots; sand grains dominantly uncoated; medium acid; clear smooth boundary.

B1h—73 to 77 inches; dark brown (7.5YR 3/2) loamy sand; single grained; loose; very few fine roots; about 50 to 75 percent of sand grains coated with organic matter; strongly acid; clear smooth boundary.

B2h—77 to 80 inches; black (5YR 2/1) sand; single grained; loose; sand grains well coated with organic material; very strongly acid.

Solum thickness exceeds 80 inches. Reaction ranges from medium acid to very strongly acid throughout. Texture is sand or loamy sand throughout.

The Ap or A1 horizon has hue of 10YR, value of 3 through 5, and chroma 1 to 3 or hue of 2.5Y, value of 4 or 5, and chroma of 2. The A21 and A22 horizons have hue of 10YR, value of 5 through 8, and chroma of 3 through 8, or they have hue of 2.5Y, value of 5 through 8, and chroma of 2. The A23 horizon has hue of 10YR, value of 6 through 8, and chroma of 1 through 4. Few to common yellowish brown or strong brown mottles and few to many uncoated sand grains occur in the lower part of the A23 horizon.

The B1h horizon has hue of 10YR, value of 3, and chroma of 1 to 3 or has hue of 7.5YR, value of 3, and chroma of 2 or 3. Sand grains are not well coated with organic matter, and the horizon does not meet the criteria for a spodic horizon. The B2h horizon has hue of 10YR, value of 2 or 3, and chroma of 3 or less; hue of 7.5YR, value of 3, and chroma of 2; or hue of 5YR, value of 2 or 3, and chroma of 3 or less.

Chipley Series

The Chipley series is a member of the thermic, coated family of Aquic Quartzipsamments. It consists of somewhat poorly drained, rapidly permeable, nearly level to sloping soils in upland flatwoods. These soils formed in thick beds of sandy marine sediment. They occur as small to medium sized areas throughout the county but dominantly in the northern half. Landscapes are slightly undulating and are dissected by ill defined to well defined drainage patterns. Slopes range from 0 to 8 percent. In most years, a water table fluctuates between depths of 20 and 40 inches for 1 month to 3 months and between depths of 40 and 60 inches for 3 to 6 months.

Chipley soils are near Albany, Blanton, Foxworth, Centenary, Lakeland, Plummer, and Hurricane soils. Albany, Blanton, and Plummer soils all have an argillic horizon within 80 inches of the soil surface. Foxworth and Lakeland soils are better drained than Chipley soils. Centenary and Hurricane soils have a Bh horizon within 55 to 80 inches of the surface.

Typical pedon of Chipley sand, 0 to 5 percent slopes, in a wooded area about 6 miles north of West Bay, approximately 100 feet east of State Highway 79 NE1/4SW1/4 sec. 20, T. 1 S., R. 16 W.

A11—0 to 4 inches; dark gray (10YR 4/1) sand; single grained; loose; few fine and medium roots; very strongly acid; clear smooth boundary.

A12—4 to 8 inches; grayish brown (10YR 5/2) sand; single grained; loose; few fine and medium roots; very strongly acid; gradual wavy boundary.

C1—8 to 20 inches; light yellowish brown (10YR 6/4) sand; single grained; loose; few fine roots; very strongly acid; gradual wavy boundary.

C2—20 to 30 inches; very pale brown (10YR 7/4) sand; single grained; loose; few to common uncoated sand grains; very strongly acid; gradual wavy boundary.

C3—30 to 38 inches; very pale brown (10YR 7/3) sand; common medium faint light gray (10YR 7/2) and common medium prominent reddish yellow (7.5YR 6/8) mottles; single grained; loose; common uncoated sand grains; very strongly acid; gradual wavy boundary.

C4—38 to 54 inches; light brownish gray (10YR 6/2) sand; few medium distinct brownish yellow (10YR 6/8) and common medium faint very pale brown (10YR 7/3) and light gray (10YR 7/1) mottles; single grained; loose; dominantly uncoated sand grains; very strongly acid; gradual wavy boundary.

C5—54 to 80 inches; light gray (10YR 7/1) sand; few medium faint light brownish gray (10YR 6/2) mottles; single grained; loose; very strongly acid.

Thickness of sand exceeds 80 inches. Reaction ranges from very strongly acid to medium acid throughout. The texture is sand or fine sand throughout. Silt plus clay content in the 10- to 40-inch control section is 5 to 10 percent.

The A1 or Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2.

The C1 and C2 horizons have hue of 10YR and have value of 7 and chroma of 1 to 8 or value of 5 or 6 and chroma of 3 through 8, or they have hue of 2.5Y, value of 6 or 8, and chroma of 4. In some pedons, few to common fine to large mottles or pockets of uncoated sand grains occur in these horizons.

The C3, C4, and C5 horizons have hue of 10YR, value of 6 to 8, and chroma of 1 to 3 with few to common, fine or medium, reddish yellow or brownish yellow, segregated iron mottles indicative of a fluctuating water table. Depth to mottles is commonly 30 to 40 inches.

Corolla Series

The Corolla series is a member of the thermic, uncoated family of Aquic Quartzipsamments. It consists of moderately well drained and somewhat poorly drained, very rapidly permeable soils that formed in thick deposits of marine sands that have been reworked by wind and wave action. These gently sloping soils occur on the lower part of side slopes of dunelike, undulating ridges near or adjacent to the coast. Slopes range from 2 to 6 percent. Depth to the seasonal high water table ranges from 20 to 60 inches.

Corolla soils are near Bayvi, Dorovan, Fripp, Osier, and Pamlico soils. Dorovan and Pamlico soils have a thick muck surface layer and are very poorly drained. Bayvi soils are on tidal marshes and are very poorly drained. Fripp soils are very similar to Corolla soils in most soil characteristics but are excessively drained and have a water table at a depth of 72 inches or more. Osier soils are poorly drained and have a seasonal high water table within 20 inches of the surface.

Typical pedon of Corolla sand in an area of Fripp-Corolla complex, 2 to 30 percent slopes, approximately 350 feet west of a paved road in St. Andrews State Park, about 250 feet north of the Gulf of Mexico, SW1/4NE1/4 sec. 22, T. 4 S., R. 15 W.

A1—0 to 1 inch; gray (10YR 6/1, rubbed) sand; single grained; loose; few fine roots; very low in organic matter; slightly acid; clear smooth boundary.

C1—1 to 20 inches; white (10YR 8/1) sand; single grained; loose; medium acid; gradual wavy boundary.

C2—20 to 80 inches; white (10YR 8/1) sand; common lenses of black heavy minerals; few thin lenses of gray (10YR 5/1) sand that are probably remnants of A1 horizons that have been covered by windblown sands; single grained; loose; medium acid.

Reaction is medium acid to neutral in all horizons. Solum thickness exceeds 80 inches. Texture is sand or fine sand. Shell fragments occur in some pedons.

The A1 horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. It ranges from 0 to 3 inches in thickness.

The C horizon has hue of 10YR, value of 7 or 8, and chroma of 1 or 2. It has few to common thin horizontal bands of black heavy minerals. It also has a few gray lenses that appear to be former A1 horizons that have been buried or covered by blowing and drifting sands. Fragments of seashells occur in some pedons. This horizon extends to a depth greater than 80 inches.

Dirego Series

The Dirego series is a member of the sandy or sandy-skeletal, siliceous, euic, thermic family of Terric Sulfihemists. It consists of very poorly drained, rapidly permeable organic soils that formed from nonwoody halophytic plant remains over sandy marine sediment. These level to nearly level soils occur in the tidal marsh. Slopes range from 0 to 1 percent. Under natural conditions, the water table is at a depth of less than 10 inches, or the soil is ponded for 6 to 12 months during most years. These soils are subject to tidal flooding.

Dirego soils are near Bayvi, Dorovan, Leon, Osier, Pamlico, Pickney, Pottsburg, and Rutlege soils. Dirego soils differ from all of the associated soils by having sulfidic materials. In addition, Bayvi, Leon, Osier, Pickney, Pottsburg, and Rutlege soils are mineral soils.

Typical pedon of Dirego muck in tidal marsh, 200 feet west of State Highway 77 and 100 feet south of a paved road in Southport, SE1/4NE1/4 sec. 28, T. 2 S., R. 14 W.

Oa—0 to 28 inches; dark reddish brown (5YR 2/2) muck; about 40 percent fiber unrubbed, less than 5 percent rubbed; massive; sticky; many fine and medium roots; high sulfur content; slightly acid in natural wet state, extremely acid dry; gradual smooth boundary.

IIC1—28 to 36 inches; very dark brown (10YR 2/2) mucky fine sandy loam; stratified with very dark gray (10YR 3/1); massive; very sticky; many fine and medium roots; slightly acid wet, extremely acid dry; gradual wavy boundary.

IIC2—36 to 40 inches; dark gray (10YR 4/1) loamy fine sand; streaks of very dark gray (10YR 3/1); moderate medium granular structure; slightly sticky; medium acid wet, extremely acid dry; gradual wavy boundary.

IIC3—40 to 46 inches; gray (10YR 6/1) fine sand; stratified with dark gray (10YR 4/1) and very dark gray (10YR 3/1); single grained; extremely acid dry; gradual wavy boundary.

IIC4—46 to 80 inches; dark gray (10YR 4/1) fine sand; streaks of very dark gray (10YR 3/1); many uncoated sand grains; extremely acid dry.

The Oa horizon has hue of 10YR, 7.5YR, or 5YR, value of 2 or 3, and chroma of 2 or 1, or; is neutral and has value of 2 or 3. Sulfur content ranges from 0.75 to 5.5 percent. The organic material is generally sapric. The mineral content ranges from 25 to 50 percent. Reaction ranges from slightly acid to neutral under natural moist conditions and is extremely acid when dry.

The IIC horizon has hue of 10YR, 7.5YR, or 5YR; value of 2 through 6; and chroma of 1 to 3. Texture ranges from sand, fine sand, and mucky sand to fine sandy loam.

Dorovan Series

The Dorovan series is a member of the dysic, thermic family of Typic Medisaprists. It consists of very poorly drained, moderately permeable soils that formed in thick deposits of well decomposed organic material. These nearly level soils are in low depressional areas in the uplands and flatwoods and along low gradient drainageways. Water covers the surface most of the time unless the soil is artificially drained. Slopes are less than 1 percent and are generally concave.

Dorovan soils are near Alapaha, Allanton, Leon, Osier, Pamlico, Pansey, Pantego, Pelham, Plummer, Pottsburg, and Rutlege soils. All the associated soils except the Pamlico soils are mineral. Pamlico soils have sandy mineral material within a depth of 51 inches.

Typical pedon of Dorovan muck in a depressional wooded area approximately 1/2 mile north of Fountain, on west side of U.S. Highway 231 right-of-way, on Jupiter Creek flood plain, NW1/4SW1/4 sec. 14, T. 1 N., R. 12 W.

Oa1—0 to 10 inches; black (10YR 2/1) muck with some partly decomposed leaves, twigs, and moss; 30 to 50 percent fiber unrubbed, 5 to 10 percent rubbed; massive; friable; common roots and partly decomposed limbs; very strongly acid; diffuse wavy boundary.

Oa2—10 to 36 inches; black (10YR 2/1) muck; about 30 percent fiber unrubbed, about 5 percent fiber rubbed; fibers remaining are partly decomposed roots and limbs; massive; friable; few to common fine and medium roots; very strongly acid; diffuse wavy boundary.

Oa3—36 to 60 inches; black (10YR 2/1) muck; 20 to 30 percent fiber unrubbed, less than 5 percent rubbed; massive; friable; few undecomposed roots; very strongly acid; gradual wavy boundary.

IICg—60 to 80 inches; very dark grayish brown (10YR 3/2) sand; sand grains mostly stained with organic coatings, few uncoated sand grains; single grained; loose; few partially decomposed roots; very strongly acid.

Thickness of the Oa horizon ranges from 51 to more than 80 inches. Reaction is very strongly acid or strongly acid. Reaction is less than 4.5 in 0.01 *M* calcium chloride. The horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or is neutral and has value of 2 or 3. It is 10 to 40 percent fiber, unrubbed, and less than 1/6 fiber, rubbed.

Some pedons have a IIC horizon. It has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. The texture is dominantly sand but ranges from sand to sandy loam.

Ebro Series

The Ebro series are members of the dysic, thermic family of Typic Medisaprists. It consists of deep, very poorly drained, moderately permeable to moderately slowly permeable soils. They formed in herbaceous and related woody hydrophytic plant remains and loamy fluvial sediment. These soils are on broad, level flood plains of the East River and Pine Log Creek and their tributaries. Slopes are less than 1 percent.

Ebro soils are near Dorovan, Pamlico, and Rutlege soils. In the subsurface layer, Dorovan soils have less than 40 percent mineral content on a weighted average. Pamlico soils have organic surface and subsurface layers less than 50 inches thick. Rutlege soils are mineral throughout.

Typical pedon of Ebro muck in an area of Ebro-Dorovan complex in a wooded flood plain, about 10 feet south of junction of Pine Log Creek and East River, 1/2 mile west of Oakledge Fish Camp, about 2-1/2 miles west of Pine Log community in Bay County, about 10 miles north of Sunnyside Beach on the Gulf of Mexico, NW1/4NE1/4 sec. 16, T. 1 S., R. 17 W.

Oa1—0 to 6 inches; very dark grayish brown (10YR 3/2) muck; less than 5 percent fiber rubbed; massive; slightly sticky; about 30 percent mineral content; many fine, medium, and coarse roots; very strongly acid; gradual wavy boundary.

Oa2—6 to 24 inches; very dark gray (10YR 3/1) muck; less than 5 percent fiber rubbed; massive; sticky; estimated 45 percent mineral content; many fine, medium, and coarse roots; very strongly acid; gradual wavy boundary.

Oa3—24 to 74 inches; black (10YR 2/1) muck; less than 5 percent fiber rubbed; massive; sticky; many medium and coarse roots; very strongly acid.

Thickness of the organic material is greater than 51 inches. Reaction is less than 4.5 in 0.01 *M* calcium chloride. Logs, stumps, roots, and fragments of woody material make up 0 to 20 percent of the organic layers. There are few to common flakes or specks of mica in some pedons. Mineral content in the organic horizons ranges from 15 to 50 percent.

The Oa1 horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2 or is neutral and has value of 2 or 3. The lower layers have hue of 7.5YR, 10YR, or 2.5Y; value of 2 or 3; and chroma of 1 or 2 or are neutral and have value of 2 or 3. Fiber content is less than 10 percent rubbed. The organic layers are dominantly massive under natural wet conditions.

Foxworth Series

The Foxworth series is a member of the thermic, coated family of Typic Quartzipsamments. It consists of moderately well drained, very rapidly permeable soils that formed in thick beds of sandy marine sediment. These nearly level to sloping soils are on slightly undulating uplands and side slopes leading to drainageways. Slopes range from 0 to 8 percent. A water table fluctuates between depths of 40 and 72 inches for 1 to 3 months during most years and between depths of 30 and 40 inches for less than 30 cumulative days in some years.

Foxworth soils are near Albany, Blanton, Chipley, Centenary, Lakeland, Stilson, and Troup soils. Albany, Blanton, Stilson, and Troup soils all have an argillic horizon at a depth of less than 80 inches. Chipley soils are more poorly drained than Foxworth soils. Centenary soils have a dark organic stained layer within a depth of 80 inches. Lakeland soils are excessively drained.

Typical pedon of Foxworth sand in a wooded area of Foxworth sand, 0 to 5 percent slopes, about 5 miles west of U.S. Highway 231, about 1/4 mile east of Deep Point Lake, NW1/4SE1/4 sec. 19, T. 2 S., R. 13 W.

A11—0 to 4 inches; grayish brown (10YR 5/2) sand; single grained; loose; many fine roots; strongly acid; clear smooth boundary.

A12—4 to 8 inches; brown (10YR 5/3) sand; single grained; loose; common fine roots; strongly acid; clear smooth boundary.

C1—8 to 40 inches; light yellowish brown (10YR 6/4) sand; single grained; loose; common fine roots; strongly acid; gradual wavy boundary.

C2—40 to 54 inches; very pale brown (10YR 7/4) sand; common fine distinct yellowish brown (10YR 5/6) mottles and common fine faint pale brown mottles; single grained; loose; common uncoated sand grains; few fine roots; strongly acid; gradual wavy boundary.

C3—54 to 68 inches; very pale brown (10YR 7/3) sand; many fine faint light gray and light yellowish brown mottles and few fine distinct strong brown (7.5YR 5/6) and yellowish brown (10YR 5/6) mottles; single grained; few fine roots; many uncoated sand grains; strongly acid; gradual wavy boundary.

C4—68 to 80 inches; light gray (10YR 7/1) or white (10YR 8/1) sand; common fine faint very pale brown and light yellowish brown mottles and few fine distinct yellowish brown (10YR 5/6, 5/8) mottles; single grained; loose; many uncoated sand grains, strongly acid.

Thickness of sand exceeds 80 inches. Reaction ranges from very strongly acid to slightly acid throughout. The silt and clay content in the 10- to 40-inch control section is 5 to 10 percent.

The A1 or Ap horizon has hue of 10YR, value of 3 through 5, and chroma of 1 through 3 or has hue of 2.5Y, value of 4 or 5, and chroma of 2.

The C1 and C2 horizons have hue of 10YR, value of 5 through 7, and chroma of 3 through 8 or have hue of 2.5Y, value of 7 or 8, and chroma of 2. In some pedons few to common fine to coarse mottles or pockets of uncoated sand grains occur in these horizons but do not indicate wetness. The C3 and C4 horizons have hue of 10YR, value of 6 through 8, and chroma of 1 through 4 and have few to common fine or medium strong brown or yellowish brown segregated iron mottles, which are indicative of a fluctuating water table. Depth to the mottles is commonly 44 to 60 inches but ranges from 40 to 72 inches.

Fripp Series

The Fripp series is a member of the thermic, uncoated family of Typic Quartzipsamments. It consists of excessively drained, very rapidly permeable soils that formed in thick deposits of marine sands that have been reworked by wind and wave action. These gently sloping to steep soils occur on dunelike, undulating ridges adjacent to the coast. Slopes range from 2 to 30 percent. Depth to the seasonal high water table is greater than 72 inches.

Fripp soils are near Bayvi, Corolla, Dorovan, Kureb, Leon, Mandarin, Osier, Pamlico, and Resota soils. Fripp and Corolla soils are very similar in most soil characteristics except that the Corolla soil has a seasonal high water table at a depth of 20 to 60 inches and is moderately well drained to somewhat poorly drained. Dorovan and Pamlico soils have a thick muck surface layer and are very poorly drained. Bayvi soils occur in tidal marsh areas subject to tidal flooding and are very poorly drained. Kureb and Resota soils are similar to Fripp soils in some soil properties but have more color in the subsurface layers and are farther from the coast. Leon and Mandarin soils are more poorly drained than Fripp soils and have an organic stained sandy layer (spodic horizon) within 30 inches of the surface. Osier soils are similar to Fripp soils in some soil properties but are poorly drained and have a water table within 10 inches of the surface for long periods.

Typical pedon of Fripp sand in an area of Fripp-Corolla complex, 2 to 30 percent slopes, approximately 300 feet west of a paved road and 200 feet north of the Gulf of Mexico, SW1/4NE1/4 sec. 22, T. 4 S., R. 15 W.

A1—0 to 3 inches; gray (10YR 5/1 rubbed) sand; single grained; loose; few fine roots; very low organic matter content; medium acid; clear smooth boundary.

C11—3 to 25 inches; white (10YR 8/1) sand; single grained; loose; strongly acid; gradual wavy boundary.

C2—25 to 80 inches; white (10YR 8/1) sand; common lenses of black heavy minerals; few thin lenses of gray (10YR 5/1) sand that are probably A1 horizons that have been covered by windblown sand; single grained; loose; strongly acid.

Reaction is strongly acid to neutral in all horizons.

The A1 horizon has hue of 10YR, value of 4 or 5, and chroma of 1 or 2. Thickness ranges from 1 to 4 inches.

The C horizon has hue of 10YR, value of 7 or 8, and chroma of 1 or 2. It has few to common thin horizontal bands of black heavy minerals. It also has a few gray lenses that appear to be former A1 horizons that have been buried by blowing and drifting sand. This horizon extends to a depth greater than 80 inches.

Hurricane Series

The Hurricane series is a member of the sandy, siliceous, thermic family of Grossarenic Entic Haplohumods. It consists of somewhat poorly drained, moderately rapidly permeable soils that formed in thick beds of sandy marine sediment. These nearly level soils are in small to moderately small flatwoods areas throughout the county but dominantly in the northern half. Areas are dissected by lower lying, poorly defined to fairly defined drainageways. Slopes range from 0 to 2 percent. A water table fluctuates between depths of 40 and 60 inches for 3 to 6 months during most years and between 20 and 40 inches for 1 month to 3 months in some years.

Hurricane soils are near Albany, Blanton, Chipley, Foxworth, Centenary, Leon, Allanton, Osier, Plummer, Pottsburg, and Rutlege soils. Albany, Blanton, and Plummer soils all have an argillic horizon at a depth of 40 to 80 inches and do not have a spodic horizon. Chipley and Foxworth soils are sandy to a depth of more than 80 inches and do not have a spodic horizon. Centenary soils are similar to Hurricane soils in most soil properties but are better drained. Leon soils are poorly drained and have a spodic horizon at a depth of 10 to 30 inches. Allanton soils are poorly drained and have an umbric epipedon. Osier soils are poorly or very poorly drained and do not have a spodic horizon. Pottsburg soils are similar to Hurricane soils in most soil properties but are poorly drained. Rutlege soils are very poorly drained, do not have a spodic horizon, and have an umbric epipedon.

Typical pedon of Hurricane sand in a wooded area about 100 yards east of U.S. Highway 231, approximately 4 miles north of Fountain, NE1/4SW1/4 sec. 36, T. 2 N., R. 12 W.

A1—0 to 6 inches; grayish brown (10YR 5/2) sand; single grained; loose; many fine and very fine roots; strongly acid; clear smooth boundary.

A21—6 to 10 inches; brown (10YR 5/3) sand; single grained; loose; few fine and medium roots; strongly acid; clear wavy boundary.

A22—10 to 22 inches; light yellowish brown (10YR 6/4) sand; single grained; loose; few fine and medium roots; few uncoated sand grains; strongly acid; gradual wavy boundary.

A23—22 to 34 inches; very pale brown (10YR 7/3) sand; single grained; loose; many uncoated sand grains; strongly acid; gradual smooth boundary.

A24—34 to 51 inches; light gray (10YR 7/2) sand; single grained; loose; strongly acid; clear smooth boundary.

B1h—51 to 55 inches; brown (7.5YR 4/2) loamy sand; weak medium subangular blocky structure, crushes to granular; very friable; noncemented; about 25 percent of sand grains uncoated; strongly acid; clear smooth boundary.

B2h—55 to 80 inches; mixed black (5YR 2/1) and dark reddish brown (5YR 3/2) sand; weak medium granular structure, crushes to granular; very friable; noncemented; sand grains well coated with organic matter; very strongly acid.

Thickness of sand exceeds 80 inches. Reaction ranges from very strongly acid to strongly acid throughout. Texture is sand or fine sand throughout. Depth to the spodic horizon is more than 50 inches.

The A1 horizon has hue of 10YR, value of 3 through 5, and chroma of 1 through 3 or hue of 2.5Y, value of 4 or 5, and chroma of 2 or is neutral and has value of 4 or 5.

The A21 and A22 horizons have hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 2 to 4, but dominantly chroma are 3 or 5. The A23 and A24 horizons have hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 to 4 but dominantly chroma of 1 or 2 with or without mottles of higher chroma.

Some pedons have a B21h horizon. This horizon is about 4 inches thick. It has hue of 10YR, value of 4 or 5, and chroma of 1 to 3. This horizon does not meet the criteria for a spodic horizon. The B22h horizon has hue of 10YR, value of 2 or 3, and chroma of 1 to 3 or has hue of 5YR, value of 2 or 3, and chroma of 1 to 4.

Kureb Series

The Kureb series is a member of the thermic, uncoated family of Spodic Quartzipsamments. It consists of deep, excessively drained, rapidly permeable soils that formed in thick deposits of sandy marine, aeolian, or fluvial sediment. These nearly level to sloping soils are on uplands near the coast. Slopes range from 0 to 5 percent and are smooth to convex.

Kureb soils are near Beaches and are adjacent to Foxworth, Lakeland, Leon, Mandarin, Resota, and Osier soils. Beaches are white, saline sands. Foxworth and Lakeland soils are in a coated family. Leon and Mandarin soils have a spodic horizon. Resota soils are similar to Kureb soils in properties and horizons but are moderately well drained. Osier soils are very poorly drained.

Typical pedon of Kureb sand, 0 to 5 percent slopes, approximately 8 miles west of Panama City, about 50 feet north of State Highway 30A, NW1/4SW1/4 sec. 22, T. 3 S., R. 16 W.

A1—0 to 6 inches; grayish brown (10YR 5/2 rubbed) sand (uncoated sand grains and humus give a salt-and-pepper appearance); single grained; loose; many fine and medium roots; very strongly acid; clear smooth boundary.

A2—6 to 14 inches; light gray (10YR 7/2) sand; single grained; loose; few medium roots; very strongly acid; abrupt smooth boundary.

C&Bh—14 to 25 inches; yellowish brown (10YR 5/8) fine sand; very thin layer and lamellae of dark brown (7.5YR 4/4); single grained; loose; few medium roots; very strongly acid; clear wavy boundary.

C1—25 to 75 inches; brownish yellow (10YR 6/6) sand; single grained; loose; very strongly acid; gradual wavy boundary.

C2—75 to 80 inches; very pale brown (10YR 8/4) sand; pockets of white (10YR 8/2) and a few streaks of brownish yellow (10YR 6/8) in old root channels; single grained; loose; very strongly acid.

Thickness of the sandy horizons exceeds 80 inches. Reaction is very strongly acid or strongly acid throughout. Silt plus clay content in the 10- to 40-inch control section is less than 5 percent.

The A1 horizon has hue of 10YR, value of 3 through 6, and chroma of 1 or 2 and has many uncoated or clean white grains. The A2 horizon has hue of 10YR, value of 7 or 8, and chroma of 1 or 2.

The C part of the C&Bh horizon has hue of 10YR and value of 5 or 6, and chroma of 4 to 8 or value of 7 or 8 and chroma of 6 or 8. The Bh part has hue of 7.5YR, value of 4, and chroma of 2 or 4 or has hue of 10YR, value of 3 or 4, and chroma of 4.

The C1 and C2 horizons have hue of 10YR, value of 6 to 8, and chroma of 1 to 8 with few to common mottles of gray and yellow.

Lakeland Series

The Lakeland series is a member of the thermic, coated family of Typic Quartzipsamments. It consists of deep, excessively drained, very rapidly permeable soils that formed in thick deposits of sandy marine or eolian sediment. These nearly level to steep soils are on uplands. Slopes range from 0 to 12 percent and are smooth to convex. The water table is at a depth of more than 80 inches throughout the year.

Lakeland soils are near Albany, Blanton, Bonifay, Chipley, Foxworth, and Troup soils. Albany soils are somewhat poorly drained and have an argillic horizon at a depth of 40 to 60 inches. Blanton, Bonifay, and Troup soils all have an argillic horizon at a depth of 40 to 80 inches. Foxworth soils are moderately well drained and have a water table at a depth of 40 to 60 inches for brief periods in the rainy season in most years.

Typical pedon of Lakeland sand, 0 to 5 percent slopes, approximately 3 miles west of U.S. Highway 231, about 1-1/2 miles south of the Bay-Jackson County line, 100 feet north of Highway 27, NW1/4SE1/4 sec. 27, T. 2 N., R. 12 W.

A1—0 to 4 inches; dark brown (10YR 4/3) sand; single grained; loose; common fine roots; strongly acid; clear smooth boundary.

C1—4 to 8 inches; yellowish brown (10YR 5/4) sand; single grained; loose; common fine roots; strongly acid; clear wavy boundary.

C2—8 to 42 inches; yellowish brown (10YR 5/8) sand; single grained; loose; few fine roots; few uncoated sand grains; strongly acid; gradual wavy boundary.

C3—42 to 82 inches; very pale brown (10YR 7/4) sand; single grained; loose; many uncoated sand grains; strongly acid.

Thickness of the sand exceeds 80 inches. Reaction is strongly acid or very strongly acid throughout unless the soil has been limed. Silt plus clay content in the 10- to 40-inch control section ranges from 5 to 10 percent.

The A1 or Ap horizon has hue of 10YR and has value of 3 through 5 and chroma of 1 or 2 or has value of 4 and chroma of 3 or has hue of 2.5Y, value of 4 to 5, and chroma of 2.

The C horizon has hue of 10YR, value of 6 to 8, and chroma of 3 through 8 or value of 5 and chroma of 4 to 8; hue of 7.5YR or 5YR, value of 5 or 6, and chroma of 6 or 8; or hue of 2.5Y, value of 7 or 8, and chroma of 4. Most of the sand grains between depths of 10 and 40 inches are uncoated. In some pedons, small pockets of light gray or white uncoated sand occur below a depth of 40 inches.

Leefield Series

The Leefield series is a member of the loamy, siliceous, thermic family of Arenic Plinthaquic Paleudults. It consists of somewhat poorly drained, moderately slowly permeable soils on the uplands of the Coastal Plain. The soils formed in deposits of sandy marine material and occur throughout the eastern half of the county, generally in small areas in the flatwoods. The landscape is dissected by poorly defined to moderately defined drainage patterns. Slopes range from 0 to 2 percent. A perched water table is at a depth of 18 to 30 inches for about 4 months during most years.

Leefield soils are near Alapaha, Albany, Chipley, Foxworth, and Stilson soils. Alapaha soils are poorly drained, and Stilson soils are moderately well drained. Albany soils have an argillic horizon below a depth of 40 inches. Chipley and Foxworth soils are sandy to a depth of 80 inches or more.

Typical pedon of Leefield sand in a wooded area, approximately 1/4 mile south of dirt road, about 4 miles west of U.S. Highway 237, SW1/4SE1/4 sec. 21, T. 2 N., R. 12 W.

A11—0 to 6 inches; very dark gray (10YR 3/1) sand; weak medium granular structure; very friable; many fine roots; strongly acid; clear smooth boundary.

A12—6 to 12 inches; dark grayish brown (10YR 4/2) sand; weak medium granular structure; loose; many fine and common medium roots; strongly acid; clear wavy boundary.

A2—12 to 28 inches; light yellowish brown (10YR 6/4) sand; few medium light gray (10YR 7/2), brownish yellow (10YR 6/8), yellow (10YR 7/6), and yellowish brown (10YR 5/8) mottles; weak medium granular structure; loose; many fine and common medium roots; strongly acid; clear, wavy boundary.

B21t—28 to 36 inches; light yellowish brown (2.5Y 6/4) sandy loam; common medium distinct light gray (10YR 7/2) and yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; very friable; few fine and medium roots; very strongly acid; gradual wavy boundary.

B22t—36 to 48 inches; light yellowish brown (2.5Y 6/4) sandy clay loam; common medium distinct light gray (10YR 7/1), yellowish brown (10YR 5/8), brownish yellow (10YR 6/6), and strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; friable; estimated 10 percent plinthite; very strongly acid; gradual wavy boundary.

B23t—48 to 62 inches; reticulately mottled light gray (10YR 7/1), gray (10YR 5/1), yellowish brown (10YR 5/8), strong brown (7.5YR 5/6), yellowish red (5YR 4/8), red (2.5YR 4/6), and very pale brown (10YR 7/3) sandy clay loam; moderate medium subangular blocky structure; firm; approximately 5 percent plinthite; very strongly acid; gradual wavy boundary.

B24tg—62 to 84 inches; light gray (10YR 7/1) light sandy clay loam; many coarse distinct yellowish brown (10YR 5/8) and gray (10YR 5/1) mottles and many medium distinct strong brown (7.5YR 5/6), brownish yellow (10YR 6/6), and red (2.5YR 4/8) mottles; weak medium subangular blocky structure; friable; less than 5 percent plinthite; very strongly acid.

Solum thickness ranges from 60 to 80 inches or more. Reaction is very strongly acid or strongly acid throughout unless the soil has been limed. Depth to horizons containing 5 percent or more plinthite ranges from 30 to 55 inches.

The B21t horizon has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 4 to 8. Few to common gray, brown, and yellow mottles occur in this horizon. The B22t horizon has hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 4 to 8 and common to many gray, brown, and red mottles. The B23t and B24tg horizons are commonly reticulately mottled with gray, brown, yellow, and red. In some pedons, they have hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 0 to 8 with common to many mottles in shades of red, brown, gray, and yellow. The Bt horizon is sandy loam or sandy clay loam.

Leon Series

The Leon series is a member of the sandy, siliceous, thermic family of Aeric Haplaquods. It consists of poorly drained, moderately permeable to moderately rapidly permeable soils that formed in thick beds of sandy material. These nearly level soils occur in the flatwoods. The areas are dissected by poorly defined drainageways. Slopes range from 0 to 2 percent. The water table is within 10 inches of the surface for 1 month to 4 months and within 10 to 40 inches for more than 9 months in most years.

Leon soils are near Mandarin, Osier, Pantego, Plummer, and Pottsburg soils. Leon soils have a spodic horizon within 30 inches of the surface; Osier, Pantego, and Plummer soils do not. In addition, Plummer soils have an argillic horizon below a depth of 40 inches. Pantego soils have an umbric epipedon and an argillic horizon within 20 inches of the surface. Pottsburg soils are similar to Leon soils, but the depth to the spodic horizon is more than 50 inches. Mandarin soils are very similar to Leon soils in most soil properties but are better drained.

Typical pedon of Leon sand in a planted forest of slash pine approximately 3/4 mile north of Mine Testing Laboratory and U.S. Highway 98, 3 miles south of West Bay along west side of woods road, NW1/4SW1/4 sec. 19, T. 3 S., R. 15 W.

A1—0 to 3 inches; very dark gray (10YR 3/1 rubbed) sand; weak fine granular structure; very friable; many fine and medium roots; many uncoated sand grains give a salt-and-pepper appearance; very strongly acid; clear smooth boundary.

A21—3 to 9 inches; gray (10YR 6/1) sand; common medium faint grayish brown streaks of sand along root channels; single grained; loose; many medium and fine roots; very strongly acid; gradual wavy boundary.

A22—9 to 15 inches; light gray (10YR 7/1) sand; few medium faint grayish brown streaks of sand along root channels; single grained; loose; few medium and fine roots; common medium pores; very strongly acid; clear wavy boundary.

B21h—15 to 18 inches; black (5YR 2/1) sand; weak medium subangular blocky structure parts to weak fine granular; friable; many fine and medium roots and pores; more than 95 percent of sand grains have organic coatings; very strongly acid; abrupt wavy boundary.

B22h—18 to 22 inches; dark reddish brown (5YR 2/2) sand; common medium faint black (10YR 2/1) mottles; distinct dark brown (7.5YR 4/4) streaks; weak fine subangular blocky structure parts to weak fine granular; friable; few fine and medium roots; common fine pores; more than 95 percent of sand grains have organic coatings; very strongly acid; clear wavy boundary.

B23h&B3—22 to 30 inches; dark brown (7.5YR 3/1) sand; common medium distinct vertical streaks of dark reddish brown (5YR 2/2) sand along root channels; weak fine granular structure; friable; few fine and medium roots and pores; many coated sand grains; very strongly acid; gradual wavy boundary.

B3—30 to 33 inches; brown (10YR 5/3) sand; few faint streaks of light brownish gray (10YR 6/2); single grained; loose; few medium and fine roots; few fine pores; many uncoated sand grains; very strongly acid; gradual irregular boundary.

A'2—33 to 66 inches; light brownish gray (10YR 6/2) sand; common medium faint dark grayish brown (10YR 4/2) mottles; single grained; loose; few medium and fine roots; many uncoated sand grains; very strongly acid; clear wavy boundary.

B'h—66 to 80 inches; very dark brown (10YR 2/2) sand; single grained; loose; common medium distinct light brownish gray (10YR 6/2) streaks and pockets; many uncoated sand grains; very strongly acid.

The solum thickness is 80 inches or more. Reaction ranges from strongly acid to extremely acid.

The A1 horizon has hue of 10YR, value of 2 through 4, and chroma of 1 or 2. When dry, the A1 horizon has a salt-and-pepper appearance caused by mixing of organic matter and uncoated white sand grains. The A2 horizon has hue of 10YR or 2.5Y, value of 5 through 8, and chroma of 1 or 2.

The Bh horizon has hue of 10YR, 7.5YR, or 5YR; value of 2 or 3; and chroma of 1 to 3. In some pedons, vertical or horizontal streaks or pockets of gray or light gray sand are in the Bh horizon. The B23h&B3 horizon has hue of 10YR or 7.5YR, value of 3 through 5, and chroma of 2 through 4. The B3 horizon has hue of 10YR or 7.5YR, value of 3 through 5, and chroma of 2 through 4 with or without mottles of gray, brown, or yellow.

Some pedons have an A'2 horizon. This horizon has hue of 10YR or 2.5Y, value of 7 through 7, and chroma of 1 or 2. In some pedons, the B3 horizon is underlain by a C horizon that extends to a depth of 80 inches or more. It has hue of 10YR, value of 6 through 8, and chroma of 3 or 4. Some pedons have a B'h horizon. The B'h horizon is similar to the Bh horizon and occurs below the A'2 or B3 horizon.

Mandarin Series

The Mandarin series is a member of the sandy, siliceous, thermic family of Typic Haplohumods. It consists of somewhat poorly drained, moderately permeable soils that formed in thick beds of sandy material. These nearly level soils are on knolls and ridges in the flatwoods areas. Areas are dissected by poorly defined to moderately defined drainageways. Slopes range from 0 to 2 percent. The water table is at a depth of 20 to 30 inches for 1 month to 3 months and at a depth of 30 to 60 inches for about 9 months in most years.

Mandarin soils are near Chipley, Centenary, Kureb, Leon, Allanton, Resota, Pamlico, Pottsburg, Hurricane, and Rutlege soils. Chipley and Rutlege soils do not have a spodic horizon within 80 inches of the surface. Pamlico soils are organic and are very poorly drained. Kureb and Resota soils are better drained than Mandarin soils and lack a spodic horizon. Leon soils are similar to Mandarin soils in most properties but are more poorly drained. Centenary, Pottsburg, and Hurricane soils have a spodic horizon at a depth of 50 inches or more. In addition, Centenary soils are better drained than Mandarin soils, and Pottsburg soils are poorly drained. Allanton soils are more poorly drained than Mandarin soils and have an umbric epipedon and a spodic horizon at a depth of more than 50 inches.

Typical pedon of Mandarin sand in a wooded area, approximately 125 feet north of U.S. Highway 98, NW1/4SE1/4 sec. 21, T. 3 S., R. 16 W.

A1—0 to 7 inches; gray (10YR 5/1 rubbed) sand; single grained; loose; many fine and common medium roots; very strongly acid; clear wavy boundry.

A2—7 to 25 inches; white (10YR 8/2) sand; single grained; loose; medium acid; abrupt wavy boundary.

B21h—25 to 36 inches; dark brown (10YR 3/3) sand; upper 1 inch is dark reddish brown (5YR 3/2); weak medium subangular blocky structure crushes to granular; friable; very strongly acid; diffuse boundary.

B22h—36 to 57 inches; dark brown (10YR 3/3) sand; weak medium granular structure; very friable; very strongly acid; clear wavy boundary.

C—57 to 80 inches; light brownish gray (10YR 6/2) sand; gradually changes to white with increasing depth; single grained; loose; very strongly acid.

Reaction ranges from medium acid to very strongly acid.

The A1 horizon has hue of 10YR, value of 2 through 5, and chroma of 1. The A1 horizon has a salt-and-pepper appearance as a result of mixing of organic matter and uncoated white sand grains. The A2 horizon has hue of 10YR or 2.5Y, value of 5 through 8, and chroma of 1 or 2.

The Bh horizon has hue of 5YR, value of 2 or 3, and chroma of 1 to 4; hue of 7.5YR, value of 3, and chroma of 2; or hue of 10YR, value of 2, and chroma of 1 or value of 3 and chroma of 1 to 3. Vertical or horizontal streaks or pockets of gray or light gray sand occur in some Bh horizons. Some pedons have a B3 horizon. The B3 horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 4 or has hue of 7.5YR, value of 4, and chroma of 2 through 4 or value of 5 and chroma of 4. In some pedons, it is mottled in gray, brown, or yellow.

The C horizon has hue of 10YR, value of 6 through 8, and chroma of 1 through 3. It extends to a depth of 80 inches or more.

Osier Series

The Osier series is a member of the siliceous, thermic family of Typic Psammaquents. It consists of poorly drained, rapidly permeable soils that formed in thick beds of Coastal Plain sandy marine sediment. These nearly level soils occur in flatwoods and depressions throughout the county. Slopes are 0 to 2 percent and are smooth to concave. The water table is within 10 inches of the surface for 3 to 6 months in most years. Depressional areas are ponded for 2 to 3 months in rainy seasons.

Osier soils are near Albany, Chipley, Dorovan, Leon, Allanton, Pamlico, Pelham, Plummer, Pottsburg, Hurricane, and Rutlege soils. Albany soils have an argillic horizon at a depth of 40 to 80 inches and are somewhat poorly drained. Chipley soils are better drained than Osier soils. Dorovan and Pamlico soils are organic soils. Leon, Allanton, Pottsburg, and Hurricane soils all have a spodic horizon within 80 inches of the surface. Pelham and Plummer soils are similar to Osier soils in drainage but have an argillic horizon within 60 inches of the surface. Rutlege soils are similar to Osier soils in drainage and in most properties but have an umbric epipedon.

Typical pedon of Osier fine sand in a cultivated area, approximately 1 mile east of Farmdale Bayou, 70 feet south of dirt road, NE1/4SE1/4 sec. 32, T. 5 S., R. 12 W.

Ap—0 to 8 inches; black (10YR 2/1 rubbed) fine sand; weak fine granular structure; very friable; common uncoated sand grains; very strongly acid; clear wavy boundary.

A&C—8 to 34 inches; dark gray (10YR 4/1 rubbed) fine sand; common fine faint streaks of very dark gray (10YR 3/1); single grained; loose; very strongly acid; gradual wavy boundary.

C1g—34 to 44 inches; dark gray (10YR 4/1 rubbed) fine sand; common streaks of uncoated sand grains; single grained; loose; very strongly acid; gradual wavy boundary.

C23g—44 to 61 inches; dark gray (10YR 4/1 rubbed) fine sand; few fine faint streaks of uncoated sand grains; single grained; loose; very strongly acid; gradual wavy boundary.

C3g—61 to 69 inches; gray (10YR 5/1 rubbed) fine sand; few fine faint streaks of uncoated sand grains; single grained; loose; extremely acid; gradual wavy boundary.

C4g—69 to 80 inches; gray (10YR 5/1) fine sand; single grained; extremely acid.

Reaction is extremely acid to strongly acid throughout. Texture is sand or fine sand throughout. Thickness of the sandy horizons is 80 inches or more.

The A horizon has hue of 10YR, value of 2 through 5, and chroma of 1 or 2. Texture is sand or fine sand.

The C or Cg horizon has hue of 10YR or 2.5Y, value of 4 through 8, and chroma of 1 or 2. The Cg horizon has few fine or medium mottles of pale brown or yellowish brown. Texture is sand or fine sand.

Pamlico Series

The Pamlico series is a member of the sandy or sandy-skeletal, siliceous, dysic, thermic family of Terric Medisaprists. It consists of very poorly drained, moderately permeable soils that formed in moderately thick deposits of well decomposed organic material overlying sandy mineral material. These nearly level soils are dominantly in depressional areas along low-gradient drainageways. Slopes are nearly level or concave and are less than 1 percent. The water table is near or above the soil surface except in periods of extended drought or where the soil is artificially drained.

Pamlico soils are near Alapaha, Dorovan, Leon, Osier, Pansey, Pantego, Pelham, Plummer, Pottsburg, and Rutlege soils. All the associated soils except Dorovan soils are mineral soils. Dorovan soils are organic materials to a depth of 51 inches or more.

Typical pedon of Pamlico muck in an area of Rutlege-Pamlico complex in a heavily wooded drainageway about 1/4 mile south of Jackson County line, along east side of U.S. Highway 231 right-of-way on Econfina Creek, NE1/4NE1/4 sec. 24, T. 2 N., R. 12 W.

Oa—0 to 32 inches; black (10YR 2/1) muck; weak coarse granular structure; friable; few partly decomposed leaves and twigs; approximately 30 percent fiber unrubbed, less than 10 percent rubbed; slightly sticky; very strongly acid; clear wavy boundary.

IIC1g—32 to 60 inches; very dark grayish brown (10YR 3/2) sand; single grained; loose; many medium roots; common uncoated sand grains; very strongly acid; gradual wavy boundary.

IIC2g—60 to 72 inches; grayish brown (10YR 5/2) sand; single grained; loose; few medium roots; many uncoated sand grains; very strongly acid.

Depth to the underlying sandy material ranges from 16 to 40 inches. Reaction is very strongly acid or extremely acid. The Oa horizon has hue of 10YR or 7.5YR, value of 2 or 3, and chroma of 1 or 2 or is neutral and has value of 2 or 3. Fiber content is 10 to 35 percent, unrubbed, and less than 10 percent, rubbed.

The IICg horizon ranges from sand to loamy sand. It has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. Few to many uncoated sand grains occur in this horizon.

Pansey Series

The Pansey series is a member of the fine-loamy, siliceous, thermic family of Plinthic Paleaquults. It consists of deep, poorly drained, slowly permeable soils that formed in loamy marine sediment. These soils are on broad flats and in poorly defined drainageways. They generally occur as small areas and most are in the northeastern part of the county. They have a water table within 20 inches of the surface for 3 to 6 months in most years. Slopes are less than 2 percent.

Pansey soils are near Alapaha, Albany, Leefield, Pantego, Pelham, Plummer, and Stilson soils. Alapaha, Leefield, and Pelham soils have a sandy A horizon that is more than 20 inches thick. Albany and Plummer soils have a sandy A horizon that is more than 40 inches thick and have no plinthite or are less than 5 percent plinthite. Pantego soils have a very dark (umbric) surface layer more than 10 inches thick.

Typical pedon of Pansey loamy sand in a wooded area approximately 2 miles south of State Highway 20, approximately 5 miles northeast of Youngstown, NW1/4NW1/4 sec. 12, T. 1 S., R. 12 W.

A1—0 to 7 inches; very dark gray (10YR 3/1) loamy sand; moderate medium granular structure; very friable; many fine and common medium roots; very strongly acid; clear smooth boundary.

A2—7 to 18 inches; light brownish gray (10YR 6/2) loamy sand; few medium distinct light yellowish brown (10YR 6/4) and pale brown (10YR 6/3) mottles; weak medium granular structure; very friable; common fine and medium roots; very strongly acid; clear smooth boundary.

B21tg—18 to 26 inches; light gray (10YR 6/1) sandy clay loam; few medium distinct light yellowish brown (10YR 6/4) and yellowish brown (10YR 5/8) mottles and common medium distinct light gray (10YR 7/2) mottles; weak medium subangular blocky structure; friable; slightly sticky when wet; few patchy clay films on ped faces; few plinthite nodules; very strongly acid; clear wavy boundary.

B22tg—26 to 62 inches; light gray (10YR 7/1) sandy clay loam; few medium distinct pale brown (10YR 6/3) mottles, common medium distinct yellowish brown (10YR 5/8) and strong brown (7.5YR 5/6) mottles and common medium prominent yellowish red (5YR 4/6) mottles; moderate medium subangular blocky structure; friable to firm; sticky and slightly plastic when wet; estimated 10 percent plinthite nodules; clay films on faces of peds; very strongly acid; gradual wavy boundary.

B23tg—62 to 80 inches; light gray (10YR 7/1) sandy clay loam with lumps or splotches of loamy sand; few medium distinct yellowish red (5YR 5/8) mottles, many coarse distinct yellowish brown (10YR 5/8) mottles, and common medium distinct strong brown (7.5YR 5/8), yellow (10YR 7/6), and pale brown (10YR 6/3) mottles; weak fine and medium subangular blocky structure; friable; patchy clay films on ped faces; estimated less than 10 percent plinthite by volume; very strongly acid.

The solum thickness is more than 60 inches. Unless limed, the soil is very strongly acid or strongly acid in all horizons. In some places, the soil is up to 5 percent strongly cemented ironstone pebbles throughout.

Thickness of the A horizon ranges from 6 to 20 inches. The A1 horizon is 4 to 9 inches thick. It has hue of 10YR, value of 2 through 4, and chroma of 1 or 2 or has hue of 2.5Y, value of 2 to 4, and chroma of 2, or is neutral and has value of 2 to 4. The A2 horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. Texture of the A horizon is dominantly loamy sand.

The B2t horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2 or is neutral and has value of 5 to 7. It has few to many mottles of yellow, brown, and red. The lower part of the Bt horizon may be reticulately mottled in gray, yellow, brown, and red. Texture of the B horizon ranges from sandy loam to sandy clay loam. Plinthite content ranges from 5 to 30 percent.

Pantego Series

The Pantego series is a member of the fine-loamy, siliceous, thermic family of Umbric Paleaquults. It consists of very poorly drained, moderately permeable soils on nearly level and slightly depressional areas. Slopes are less than 2 percent. The water table is at a depth of 10 inches or less for 2 to 4 months during most years and at a depth of 10 to 40 inches for 3 to 6 months.

Pantego soils are near Albany, Allanton, Dorovan, Hurricane, Osier, Pamlico, Pelham, Plummer, Pottsburg, and Rutlege soils. Pantego soils have an umbric epipedon and an A horizon less than 20 inches thick, whereas Albany, Pelham, and Plummer soils have an ochric epipedon and an A horizon more than 20 inches thick. In addition, Albany soils are better drained than Pantego soils. Hurricane, Osier, and Pottsburg soils have an ochric epipedon and are sandy throughout. In addition, Pottsburg and Hurricane soils have a spodic horizon at a depth of 50 to 80 inches. Dorovan and Pamlico soils are organic. Rutlege soils are sandy throughout.

Typical pedon of Pantego sandy loam in a wooded area approximately 1 mile north of Bennett Road and 1/2 mile east of State Road 167, NW1/4NE1/4 sec. 15, T. 1 S., R. 13 W.

A1—0 to 18 inches; very dark gray (10YR 3/1) sandy loam; weak medium granular structure; very friable; many fine and medium roots; high organic matter content; very strongly acid; clear smooth boundary.

B21tg—18 to 32 inches; dark gray (10YR 4/1) sandy clay loam; weak medium subangular blocky structure; friable; common fine and medium roots; very strongly acid; gradual wavy boundary.

B22tg—32 to 80 inches; gray (10YR 6/1) sandy clay loam; common medium distinct brownish yellow (10YR 6/6), yellowish brown (10YR 5/6), strong brown (7.5YR 5/6), and pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; friable; thin patchy clay films on ped faces; very strongly acid.

Solum thickness is more than 60 inches. Reaction is strongly acid or very strongly acid throughout. The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1, or it is neutral and has value of 2 or 3. Thickness ranges from 10 to 20 inches.

The B2tg horizon has hue of 10YR, value of 3 to 7, and chroma of 1 or 2 or has hue of 2.5Y, value of 6 or 7, and chroma of 2. It has few to common mottles of brown and yellow. Texture ranges from sandy loam to clay loam. The upper 20 inches of the B2t horizon has hue of 10YR, value of 4 through 7, and chroma of 1 or 2, or it is neutral and has value of 4 through 7. It has few to common mottles of higher chroma. Texture is sandy loam to sandy clay loam.

Pelham Series

The Pelham series is a member of the loamy, siliceous, thermic family of Arenic Paleaquults. It consists of poorly drained, moderately permeable soils that formed in deep, unconsolidated Coastal Plain marine sediment. These nearly level soils occur on broad flats to slightly depressional areas and poorly defined drainageways. Slopes are 0 to 2 percent and are smooth to concave.

The water table is within 15 inches of the surface for 3 to 6 months in most years. Depressional areas and poorly defined drainageways are frequently flooded or ponded for 1 to 3 months in rainy seasons.

Pelham soils are near Alapaha, Albany, Chipley, Dorovan, Leon, Allanton, Osier, Pamlico, Plummer, Pottsburg, Hurricane, and Rutlege soils. Alapaha soils are very similar to Pelham soils in drainage and most soil properties but differ by having more than 5 percent plinthite within 60 inches of the surface. Albany and Plummer soils have an argillic horizon below a depth of 40 inches. In addition, Albany soils are better drained than Pelham soils. Chipley and Osier soils are sandy to a depth of more than 80 inches. In addition, Chipley soils are better drained than Pelham soils. Dorovan and Pamlico soils are organic. Allanton, Pottsburg, and Hurricane soils all have a spodic horizon. Rutlege soils have an umbric epipedon and are sandy throughout.

Typical pedon of Pelham sand in a grassy wooded area approximately 2-1/2 miles east of State Highway 79, about 4 miles south of Bay-Washington County line, SW1/4SW1/4 sec. 23, T. 1 S., R. 16 W.

A1—0 to 6 inches; dark gray (10YR 4/1) sand; single grained; loose; many fine and common medium roots; very strongly acid; clear smooth boundary.

A21—6 to 24 inches; light brownish gray (10YR 6/2) sand; few streaks of gray (10YR 5/1); single grained; loose; many fine and few medium roots; very strongly acid; gradual wavy boundary.

A22—24 to 34 inches; light gray (10YR 7/2) sand; single grained; loose; common fine and few medium roots; very strongly acid; gradual wavy boundry.

B21tg—34 to 38 inches; light brownish gray (10YR 6/2) sandy loam; few fine faint pale yellow mottles; weak medium subangular blocky structure; few fine roots; very friable; very strongly acid; gradual wavy boundary.

B22tg—38 to 58 inches; light brownish gray (10YR 6/2) sandy clay loam; common medium distinct very pale brown (10YR 7/4) and yellow (10YR 7/6) mottles and few medium distinct yellowish brown (10YR 5/4) mottles; moderate medium subangular blocky structure; friable; very strongly acid; gradual wavy boundary.

B23tg—58 to 80 inches; light gray (10YR 7/1) sandy clay loam; common medium distinct pale brown (10YR 6/3), yellow (10YR 7/6), yellowish brown (10YR 5/6), and yellowish red (5YR 4/6) mottles; moderate medium subangular blocky structure; friable; very strongly acid.

Solum thickness is more than 80 inches. Reaction is very strongly acid or strongly acid throughout all horizons.

The A1 horizon has hue of 10YR to 5Y, value of 2 to 4, and chroma of 1, or it is neutral and has value of 2 to 4. Texture is sand. The A2 horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2, or it is neutral and has value of 4 to 7. Texture is dominantly sand but ranges from sand to loamy sand.

The Btg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. It has few to many mottles in shades of yellow, brown, red, and gray. Texture is dominantly sandy clay loam but ranges to sandy loam.

Pickney Series

The Pickney series is a member of the sandy, siliceous, thermic family of Cumulic Humaquepts. It consists of very poorly drained, rapidly permeable soils that formed in sandy marine deposits. These nearly level soils are on low broad flats and slightly depressional areas along poorly defined drainageways. Slopes are nearly level and smooth to concave and are less than 2 percent. The water table is at or near the surface for 4 to 6 months in most years. Many areas are frequently ponded after flooding in rainy seasons.

Pickney soils are near Alapaha, Allanton, Dorovan, Leon, Pamlico, Pantego, Plummer, Pottsburg, Osier, and Rutlege soils. Pickney soils have a very dark gray or black A1 surface layer more than 24 inches thick. Alapaha, Leon, Plummer, Pottsburg, and Osier soils have an A1 surface layer that is less than 10 inches thick. In addition, Alapaha and Plummer soils have a loamy argillic horizon within 60 inches of the surface. Leon and Pottsburg soils have a dark, organic stained layer within 80 inches of the surface. Allanton soils have an A1 surface layer less than 24 inches thick and have an organic stained layer within 80 inches of the surface. Dorovan and Pamlico soils are organic soils and do not have a mineral A1 surface layer. Pantego soils have an A1 horizon that is thinner than that of Pickney soils and is usually organic, and they have a loamy argillic horizon within 20 inches of the surface. Rutlege soils are similar to Pickney soils in most properties but have an A1 surface layer less than 24 inches thick.

Typical pedon of Pickney fine sand in a planted slash pine area approximately 18 miles southeast of Panama City, approximately 3 miles northwest of Mexico Beach, about 1 mile north of U.S. Highway 98, NE1/4SE1/4 sec. 5, T. 6 S., R. 12 W.

A1—0 to 30 inches; black (10YR 2/1 rubbed) fine sand; weak fine granular structure crushes to single grained; very friable to loose; many fine and medium roots; very strongly acid; gradual wavy boundary.

AC—30 to 46 inches; dark gray (10YR 4/1 rubbed) fine sand; irregular streaks of black (10YR 2/1); single grained; loose; many fine and medium roots; very strongly acid; gradual wavy boundary.

Cg—46 to 80 inches; gray (10YR 5/1 rubbed) fine sand; irregular streaks and lumps of yellowish brown (10YR 5/4) and few fine faint streaks or mottles of dark yellowish brown (10YR 3/4) and light gray (10YR 7/1) uncoated sand grains; single grained; loose; very strongly acid.

Depth to the Cg horizon is 30 to 60 inches. Reaction is very strongly acid to strongly acid throughout.

The A horizon has hue of 5YR to 2.5Y, value of 2 or 3, and chroma of 1 or 2, or it is neutral and has value of 2 or 3. Texture ranges from fine sand to loamy fine sand. Thickness ranges from 24 to 60 inches.

The Cg horizon has hue of 10YR or 2.5Y, value of 3 to 7, and chroma of 1 or 2, or it is neutral and has value of 3 to 7. Texture ranges from sand to loamy sand.

Plummer Series

The Plummer series is a member of the loamy, siliceous, thermic family of Grossarenic Paleaquults. It consists of poorly drained, moderately permeable soils that formed in thick beds of sandy and loamy marine materials. These nearly level soils are on nearly level to depressional landscapes and along poorly defined drainageways. Slopes are 0 to 2 percent. A water table is within a depth of 10 inches for 3 to 6 months in most years. Some depressional areas are ponded for 2 to 4 months during the rainy season.

Plummer soils are near Alapaha, Albany, Chipley, Dorovan, Leefield, Leon, Allanton, Pamlico, Pansey, Pelham, Pottsburg, Hurricane, Rains, and Rutlege soils. None of the associated soils have an argillic horizon, except Albany soils, which are better drained than Plummer soils, and Alapaha soils, which have a loamy subsoil with a depth of 40 inches. In addition, Leon, Allanton, Pottsburg, and Hurricane soils have a spodic horizon. Dorovan and Pamlico soils are organic.

Typical pedon of Plummer sand in an open field approximately 400 feet east of Fox Avenue and 250 feet north of Lisa Lane, NE1/4SW1/4 sec. 8, T. 4 S., R. 13 W.

A1—0 to 7 inches; dark gray (10YR 4/1) sand; weak fine granular structure; very friable; low organic matter content; few medium and many fine roots; strongly acid; clear wavy boundary.

A21g—7 to 25 inches; gray (10YR 6/1) sand; single grained; loose; common fine roots; strongly acid; gradual wavy boundary.

A22g—25 to 48 inches; light gray (10YR 7/1) sand; single grained; loose; many uncoated sand grains; strongly acid; gradual wavy boundary.

B21tg—48 to 59 inches; gray (10YR 6/1) sandy loam; common medium distinct yellowish brown (10YR 5/6) mottles; moderate fine subangular blocky structure; friable; strongly acid; gradual wavy boundary.

B22tg—59 to 80 inches; gray (10YR 6/1) sandy clay loam; common medium distinct red (2.5YR 4/6) mottles and few medium distinct yellowish brown (10YR 5/6) and strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; friable; strongly acid.

Reaction is strongly acid or very strongly acid in all horizons unless the soil has been limed. The solum thickness is 72 inches or more.

The A1 or Ap horizon has hue of 10YR, value of 2 through 4, and chroma of 1. Where value is 3 or less, thickness is less than 6 inches. The A2 horizon has hue of 10YR or 5Y, value of 5 through 8, and chroma of 1 or 2. Total thickness of the A horizon ranges from 40 to 60 inches.

The B21t horizon has hue of 10YR or 5Y, value of 5 to 7, and chroma of 1 or 2, or it is neutral and has value of 5 to 7. Few to many fine or medium brown and yellow mottles are throughout the horizon. Texture is sandy clay loam or sandy loam.

The B22t horizon has colors similar to those of the B21t horizon and many fine or medium brown, yellow, and red mottles. Texture is sandy clay loam or sandy loam.

Pottsburg Series

The Pottsburg series is a member of the sandy, siliceous, thermic family of Grossarenic Haplaquods. It consists of poorly drained, moderately permeable soils that formed in thick beds of Coastal Plain sandy marine sediment. These nearly level soils are in the flatwoods. Slopes are 0 to 2 percent. The water table is within 10 inches of the surface for 3 to 6 months in most years. Low-lying areas may be ponded for 2 to 6 months in rainy seasons.

Pottsburg soils are near Albany, Chipley, Dorovan, Foxworth, Centenary, Leon, Allanton, Osier, Pamlico, Plummer, Hurricane, and Rutlege soils. Albany, Chipley, Foxworth, Osier, Plummer, and Rutlege soils do not have a spodic horizon within 80 inches of the surface. In addition, Albany and Plummer soils have an argillic horizon within 40 to 60 inches of the surface. Centenary soils have profiles similar to those of the Pottsburg soils but are moderately well drained. Leon soils are similar to Pottsburg soils in drainage but have a spodic horizon within 30 inches of the surface. Dorovan and Pamlico soils have a thick, dark, mucky surface layer more than 20 inches thick. Allanton soils are similar to Pottsburg soils in drainage and in most soil properties but have a dark A1 horizon that is high in content of organic matter and is more than 10 inches thick. Hurricane soils are similar to Pottsburg soils in most properties but are better drained.

Typical pedon of Pottsburg sand in a wooded area approximately 0.2 mile east of U.S. Highway 231, about 0.4 mile north of Atlantic and St. Andrews Railroad, NE1/4SW1/4 sec. 36, T. 2 N., R. 12 W.

A1—0 to 5 inches; dark gray (10YR 4/1) sand; single grained; loose; many fine and medium roots; very strongly acid; clear smooth boundary.

A21—5 to 12 inches; grayish brown (10YR 5/2) sand; single grained; loose; many fine and medium roots; very strongly acid; gradual wavy boundary.

A22—12 to 30 inches; light brownish gray (10YR 6/2) sand; single grained; loose; few fine and medium roots; very strongly acid; gradual wavy boundary.

A23—30 to 60 inches; light gray (10YR 7/1) sand; single grained; loose; very strongly acid; clear smooth boundary.

B1h—60 to 64 inches; brown (10YR 5/3) sand; single grained; estimated 30 to 40 percent of sand grains coated with organic matter; very strongly acid; clear smooth boundary.

B2h—64 to 80 inches; very dark gray (10YR 3/1) sand; single grained; loose; sand grains coated with organic matter; very strongly acid.

All horizons are sand or fine sand to a depth of more than 80 inches. Reaction is very strongly acid or strongly acid throughout the profile.

The A1 horizon has hue of 10YR, value of 3 through 5, and chroma of 1 or 2. The A21 horizon has hue of 10YR, value of 4 through 7, and chroma of 1 or 2. The A22 and A23 horizons have hue of 10YR or 2.5Y, value of 5 through 8, and chroma of 1 or 2. The A2 horizon has few to common, fine to medium, faint mottles of light gray, pale brown, or yellowish brown.

The Bh horizon has hue of 10YR or 7.5YR, value of 3 through 5, and chroma of 1 to 3; or it is neutral and has value of 2. Sand grains are well coated with organic matter.

Rains Series

The Rains series is a member of the fine-loamy, siliceous, thermic family of Typic Paleaquults. It consists of poorly drained, moderately permeable soils that formed in thick beds of loamy marine sediment. These nearly level soils are in low-lying positions of the Coastal Plain and in depressional areas. Slopes range from 0 to 2 percent. The water table is at a depth of less than 10 inches for 2 to 6 months during most years.

Rains soils are near Albany, Chipley, Pantego, Pelham, Plummer, Hurricane, and Rutlege soils. Chipley, Hurricane, and Rutlege soils are sandy to a depth of 80 inches or more. In addition, Rutlege soils have an umbric epipedon. Albany, Pelham, and Plummer soils all have an argillic horizon at a depth of more than 20 inches. Pantego soils are poorly drained and have an umbric epipedon.

Typical pedon of Rains sand in a grass field approximately 0.25 mile north of a dirt road and 0.25 mile east of Pine Log Creek, NE1/4NE1/4 sec. 8, T. 1 S., R. 16 W.

A1—0 to 6 inches; very dark gray (10YR 3/1) sand; weak fine granular structure; very friable; many fine and few medium roots; low organic matter content; strongly acid; clear smooth boundary.

A2—6 to 13 inches; gray (10YR 5/1) sand; single grained; loose; few fine roots; very low organic matter content; very strongly acid; clear wavy boundary.

B21tg—13 to 26 inches; gray (10YR 6/1) sandy clay loam; few medium distinct yellowish brown (10YR 5/6) mottles and common large faint pale brown mottles; weak medium subangular blocky structure; friable; few fine roots; very strongly acid; gradual wavy boundary.

B22tg—26 to 58 inches; gray (10YR 6/1) sandy clay loam; common medium distinct reddish yellow (7.5YR 6/6) mottles and many large faint pale brown and few fine prominent red mottles; weak medium subangular blocky structure; friable; clay films on ped faces; very strongly acid; gradual wavy boundary.

B23tg—58 to 73 inches; mixed gray (10YR 6/1) pale brown (10YR 6/3) and reddish yellow (7.5YR 6/6) sandy clay loam; weak medium subangular blocky structure; friable; very strongly acid; gradual wavy boundary.

Cg—73 to 80 inches; gray (10YR 5/1) loamy sand; single grained; loose; very strongly acid.

The solum is more than 60 inches thick. Reaction ranges from very strongly acid to strongly acid throughout.

The A1 horizon has hue of 10YR, value of 2 to 4, and chroma of 1. The A2 horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. Texture of the A horizon is sand or loamy sand. Total thickness ranges from 4 to 14 inches.

The B2tg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2 and has few to many mottles in shades of red, yellow, and brown. The lower part of the B2tg horizon is generally mixed gray, red, yellow, and brown. Texture is predominantly sandy clay loam but ranges to sandy loam in the upper few inches in some pedons. Average clay content in the control section is 18 to 35 percent.

The Cg horizon has hue of 10YR, value of 5 to 7, and chroma of 1. Texture ranges from sand to sandy clay.

Resota Series

The Resota series is a member of the thermic, uncoated family of Spodic Quartzipsamments. It consists of deep, moderately well drained, very rapidly permeable soils that formed in thick deposits of sandy marine sediment. These nearly level to gently sloping soils are on low ridges near the Gulf coast in the southern part of the county. Slopes range from 0 to 5 percent and are smooth to convex. A water table is at a depth of 40 to 60 inches in wet seasons.

Resota soils are near Chipley, Foxworth, Kureb, Leon, Mandarin, and Fripp soils. Chipley and Foxworth soils do not have an albic horizon and have no evidence of any spodic properties. In addition, Chipley soils are somewhat poorly drained. Kureb soils are similar to Resota soils in most properties but are excessively drained. Leon and Mandarin soils have a thick spodic horizon within a depth of 30 inches and are more poorly drained than Resota soils. Fripp soils do not have spodic properties. Fripp soils are excessively drained.

Typical pedon of Resota fine sand, 0 to 5 percent slopes, in a wooded area approximately 8 miles west of Panama City, 100 feet north of U.S. Highway 98, NE1/4SE1/4 sec. 21, T. 3 S., R. 16 W.

A1—0 to 4 inches; light brownish gray (10YR 6/2 rubbed) fine sand; single grained; loose; many fine and medium roots; salt-and-pepper appearance when dry; strongly acid; clear smooth boundary.

A2—4 to 19 inches; light gray (10YR 7/1) fine sand; single grained; loose; few medium roots; strongly acid; abrupt wavy boundary.

B21—19 to 27 inches; brownish yellow (10YR 6/6) fine sand; about 20 percent of horizon is light gray (10YR 7/1) sand from horizon above; single grained; loose; strongly acid; clear wavy boundary.

B22—27 to 42 inches; yellow (10YR 7/6) fine sand; few coarse distinct yellowish brown (10YR 5/8) mottles or nodules; single grained; loose; strongly acid; gradual smooth boundary.

C1—42 to 51 inches; very pale brown (10YR 8/4) fine sand; few fine and medium distinct light gray (10YR 7/1) mottles; single grained; loose; strongly acid; gradual wavy boundary.

C2—51 to 80 inches; white (10YR 8/1) fine sand; streaks and mottles of very pale brown (10YR 7/3) and few medium distinct yellowish brown (10YR 5/8) mottles; single grained; loose; strongly acid.

Thickness of the sand exceeds 80 inches. Reaction is strongly acid or very strongly acid throughout. The silt plus clay content in the 10- to 40-inch control section is less than 5 percent.

The A1 horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. Texture is sand or fine sand. A mixture of dark organic matter and light gray sand grains gives the surface horizon a salt-and-pepper appearance. The A2 horizon has hue of 10YR, value of 6 to 8, and chroma of 1 or 2.

The B horizon has hue of 10YR and value of 5 or 6 and chroma of 4 to 8, or value of 7 and chroma of 6 or 8 or has hue of 7.5YR, value of 5, and chroma of 6 or 8. Few to common yellowish or reddish mottles are in the B horizon below a depth of 40 inches. In some pedons, a thin Bh horizon is at the base of the A2 horizon and surrounds tongues of A2 horizon material. The Bh horizon has hue of 10YR to 2.5YR, value of 2 or 3, and chroma of 1 to 3.

The C horizon has hue of 10YR, value of 6 to 8, and chroma of 1 to 4.

Rutlege Series

The Rutlege series is a member of the sandy, siliceous, thermic family of Typic Humaquepts. It consists of very poorly drained, rapidly permeable soils that formed in sandy marine deposits. These nearly level soils are in slightly depressional areas. Slopes are smooth to concave and are less than 2 percent. The water table is at or near the surface for 4 to 6 months annually. Many depressional areas are frequently ponded.

Rutlege soils are near Chipley, Dorovan, Mandarin, Leon, Allanton, Pamlico, Pantego, Pickney, Plummer, Pottsburg, Hurricane, Osier, and Rains soils. Rutlege soils are more poorly drained than Chipley, Leon, Mandarin, Plummer, Pottsburg, Hurricane, Osier, and Rains soils. In addition, Leon, Mandarin, Pottsburg, and Hurricane soils have a spodic horizon, and Plummer and Rains soils have an argillic horizon. Pickney soils have an umbric epipedon that is more than 24 inches thick. Allanton soils have a spodic horizon at a depth of more than 50 inches. Dorovan and Pamlico soils are organic. Pantego soils have an argillic horizon within 29 inches of the surface.

Typical pedon of Rutlege sand in a wooded area approximately 0.4 mile east of U.S. Highway 98, about 0.5 mile west of County Road 30D, NW1/4SE1/4 sec. 26, T. 3 S., R. 16 W.

A11—0 to 13 inches; black (10YR 2/1) sand; weak fine granular structure; very friable; few medium and fine roots; high organic matter content; very strongly acid; gradual wavy boundary.

A12—13 to 22 inches; very dark gray (10YR 3/1) sand; single grained; loose; few fine roots; medium organic matter content; very strongly acid; gradual smooth boundary.

C1g—22 to 55 inches; gray (10YR 6/1) sand; single grained; loose; very strongly acid; gradual wavy boundry.

C2g—55 to 80 inches; light gray (10YR 7/1) sand; few fine to medium faint gray and light yellowish brown mottles; single grained; loose; very strongly acid.

Depth to the Cg horizon is 10 to 24 inches. Reaction is extremely acid or very strongly acid throughout.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2, or it is neutral and has value of 2 or 3. Thickness is greater than 10 inches. Texture is sand or loamy sand.

The Cg horizon has hue of 10YR or 5Y, value of 4 to 7, and chroma of 1 or 2 if mottled or chroma of 1 if not mottled. In some pedons, it has few to many mottles of brown, yellow, and gray.

Sapelo Series

The Sapelo series is a member of the sandy, siliceous, thermic family of Ultic Haplaquods. It consists of poorly drained, moderately permeable soils that formed in thick beds of sandy material over loamy material. These nearly level soils are in small or very small areas of the flatwoods. Slopes range from 0 to 2 percent. The water table is at a depth of 10 to 30 inches for 2 to 4 months in most years and within 40 inches for about 9 months in most years.

Sapelo soils are near Albany, Chipley, Dorovan, Leefield, Leon, Pamlico, Pantego, Pelham, Plummer, and Rutlege soils. Albany, Leefield, Pelham, and Plummer soils do not have a spodic horizon. Dorovan and Pamlico soils are organic soils. Chipley and Rutlege soils do not have an argillic or spodic horizon. Leon soils do not have an argillic horizon. Pantego soils have an umbric epipedon and do not have a spodic horizon.

Typical pedon of Sapelo sand in pasture, on the east side of Fox Street in Calloway, about 1,700 feet south of State Highway 22, SW1/4SE1/4 sec. 7, T. 4 S., R. 13 W.

Ap—0 to 6 inches; black (10YR 2/1) sand; single grained; loose; many fine roots; strongly acid; clear smooth boundary.

A2—6 to 20 inches; gray (10YR 6/1) sand; single grained; loose; many fine roots; strongly acid; abrupt smooth boundary.

B2h—20 to 27 inches; very dark grayish brown (10YR 3/1) sand; weak fine subangular blocky structure crushes to granular; friable; strongly acid; gradual wavy boundary.

A'21—27 to 42 inches; pale brown (10YR 6/3) sand; single grained; loose; strongly acid; gradual wavy boundry.

A'22—42 to 58 inches; light gray (10YR 7/2) sand; single grained; loose; strongly acid; clear smooth boundary.

B'2t—58 to 80 inches; brownish yellow (10YR 6/6) sandy loam; few fine faint yellowish brown mottles; weak fine subangular blocky structure; friable; strongly acid.

Solum thickness ranges from 70 to 80 inches or more. Reaction is strongly acid or very strongly acid. Depth to the Bh horizon is 10 to 24 inches, and depth to the B'2t horizon is 40 to 70 inches.

The Ap or A1 horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. The A2 horizon has hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 1 or 2. Texture of the A horizon is sand or fine sand.

The Bh horizon has hue of 10YR, 7.5YR, or 5YR; value of 2 to 4; and chroma of 1 through 4. Some pedons have a Bh&B3 horizon. This horizon has hue of 10YR, value of 3 to 7, and chroma of 3 or 4.

The A'2 horizon has hue of 10YR, 2.5Y, or 5Y; value of 5 through 8; and chroma of 1 through 4.

The B't horizon has hue of 10YR, 2.5Y, or 5Y; value of 5 through 8; and chroma of 1 through 6. It has few to many mottles in shades of red, yellow, and brown. Texture of the B't horizon is dominantly sandy loam but includes sandy clay loam.

Stilson Series

The Stilson series is a member of the loamy, siliceous, thermic family of Arenic Plinthic Paleudults. It consists of moderately well drained, moderately permeable soils that formed in thick beds of loamy and clayey marine sediment. These nearly level to sloping soils are on broad upland areas and side slopes leading to drainageways. A perched water table is above the subsoil briefly in winter and early in spring. Slopes range from 0 to 8 percent.

Stilson soils are near Alapaha, Albany, Blanton, Bonifay, Dorovan, Leefield, Pamlico, and Pelham soils. Alapaha soils are poorly drained and do not have plinthite. Albany, Blanton, and Bonifay soils have an A horizon more than 40 inches thick. Dorovan and Pamlico soils are organic. Leefield soils have mottles with chroma of 2 or less within a depth of 30 inches.

Typical pedon of Stilson sand, 0 to 5 percent slopes, in Bear Creek area, approximately 1/4 mile northwest of U.S. Highway 231, on north side of dirt road, NW1/4SW1/4 sec. 17, T. 2 S., R. 12 W.

A1—0 to 7 inches; dark gray (10YR 4/1) sand; moderate medium granular structure; very friable; very strongly acid; clear smooth boundary.

A21—7 to 22 inches; light brownish gray (2.5Y 6/2) loamy sand; moderate medium granular structure; very friable; strongly acid; clear wavy boundary.

A22—22 to 34 inches; very pale brown (10YR 7/4) loamy sand; single grained; loose; strongly acid; clear wavy boundary.

B21t—34 to 38 inches; light yellowish brown (10YR 6/4) sandy loam; weak medium subangular blocky structure; very friable; strongly acid; clear wavy boundary.

B22t—38 to 58 inches; light yellowish brown (10YR 6/4) sandy clay loam; common medium distinct yellowish brown (10YR 5/8) and brownish yellow (10YR 6/6) and few medium distinct light brownish gray (10YR 6/2) mottles in lower part; moderate medium subangular blocky structure; friable; few medium and fine roots; estimated 15 percent plinthite; few ironstone nodules; very strongly acid; clear wavy boundary.

B23t—58 to 80 inches; reticulately mottled light gray (10YR 7/1), brownish yellow (10YR 6/8), weak red (2.5YR 5/2), and red (2.5YR 4/8) sandy clay loam; moderate medium subangular blocky structure; friable; estimated 10 percent plinthite; very strongly acid.

Solum thickness ranges from 60 to 80 inches or more. Reaction is very strongly acid or strongly acid throughout except where the soil has been limed. Depth to horizons containing 5 percent or more plinthite ranges from 30 to 50 inches. Content of ironstone nodules ranges from 0 to 5 percent in the A horizon and upper part of the Bt horizon.

The A horizon ranges from 20 to 40 inches in thickness. The A1 or Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2; has hue of 2.5Y, value of 4, and chroma of 2; or it is neutral and has value of 3 or 4. The A2 horizon has hue of 10YR, value of 5 to 7, and chroma of 4 or has hue of 2.5Y and value of 5 and chroma of 2 to 6, value of 6 and chroma of 2 to 8, or value of 7 and chroma of 4. Texture is loamy sand or sand.

The B21t horizon has hue of 10YR, value of 5 or 6, and chroma of 4 to 8 or has hue of 2.5Y and value of 6 and chroma of 4 or 6 or value of 7 and chroma of 6 or 8.

The B22t horizon has hue of 10YR and value of 5 and chroma of 4 or 6, value of 6 and chroma of 4 to 8, or value of 7 and chroma of 6 or has hue of 2.5Y and value of 6 and chroma of 4 or value of 7 and chroma of 8. Few to common distinct and prominent red, yellowish red, strong brown, and pale brown mottles are throughout the horizon. The B23t horizon is reticulately mottled red, yellow, brown, and gray. Texture of the Bt horizon is sandy clay loam or sandy loam. Plinthite content is 5 to 35 percent between depths of 30 and 50 inches.

Troup Series

The Troup series is a member of the loamy, siliceous, thermic family of Grossarenic Paleudults. It consists of well drained, moderately permeable soils that formed in thick deposits of sandy and loamy marine sediment. These nearly level to strongly sloping soils are in the northern part of the county on broad upland areas and hillsides leading to drainageways. Slopes range from 0 to 12 percent. The water table is below a depth of 72 inches.

Troup soils are near Albany, Blanton, Bonifay, Chipley, Foxworth, and Lakeland soils. Troup soils are better drained than Albany and Blanton soils and do not have mottles of chroma of 2 or less in the subsoil. Bonifay soils have plinthite within 60 inches of the surface. Chipley and Foxworth soils are sandy to a depth of 80 inches or more and are more poorly drained than Troup soils. Lakeland soils are well drained to excessively drained and are sandy to a depth of 80 inches or more.

Typical pedon of Troup sand, 0 to 5 percent slopes, in a slash pine plantation on the north side of U.S. Highway 231, approximately 1/2 mile south of Bear Creek, SW1/4NE1/4 sec. 17, T. 2 S., R. 12 W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) sand; weak medium granular structure; loose; many fine roots; strongly acid; abrupt smooth boundary.

A21—8 to 18 inches; yellowish brown (10YR 5/4) sand; weak medium granular structure; loose; many fine roots and common medium roots; strongly acid; clear wavy boundary.

A22—18 to 44 inches; yellowish brown (10YR 5/8) sand; weak medium granular structure; loose; few fine and medium roots; few uncoated sand grains in lower part; strongly acid; clear wavy boundary.

A23—44 to 48 inches; yellowish brown (10YR 5/8) loamy sand; moderate medium granular structure; very friable; few fine and medium roots; few uncoated sand grains; strongly acid; diffuse wavy boundary.

B21t—48 to 56 inches; strong brown (7.5YR 5/6) sandy loam; weak medium subangular blocky structure; very friable; sand grains coated and bridged with clay; strongly acid; gradual wavy boundary.

B22t—56 to 80 inches; yellowish red (5YR 4/8) sandy clay loam; few medium distinct yellowish brown (10YR 5/8) and strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; sand grains coated and bridged with clay; friable; strongly acid.

The solum thickness is 80 inches or more. Reaction is strongly acid or very strongly acid in all horizons except where the soil has been limed.

The A1 or Ap horizon has hue of 10YR, value of 3 through 6, and chroma of 2 to 4. The A2 horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 through 8. The texture of the A horizon is dominantly sand but ranges to loamy sand. The thickness of the A horizon ranges from 40 to 80 inches but is commonly 46 to 66 inches.

The B2t horizon has hue of 2.5YR or 5YR, value of 4 to 5, and chroma of 6 or 8 or hue of 7.5YR, value of 5 or 6, and chroma of 6 or 8. Texture is sandy clay loam or sandy loam.

Formation of the Soils

In this section, the factors of soil formation are discussed and related to the soils in Bay County. In addition, the processes of soil formation are described.

Factors of Soil Formation

Soils form when parent material, climate, relief, and plants and animals interact for a period of time. These factors, including time, determine the nature of the soil that forms. 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 soils will generally have 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.

Climate

The amount of precipitation, the temperature, the humidity, and the wind are the climatic forces that act on the parent materials of soils. These forces also cause some variation in the plant and animal life on and in the soils.

This survey area has a warm, humid climate. The Gulf of Mexico and the large bays, together with numerous inland lakes, have a moderating effect on both summer and winter temperatures. Summer temperatures are fairly uniform from year to year and show little day to day variation. Winter temperatures, however, vary considerably from day to day. Rainfall averages about 60 inches a year.

Because of the warm climate and abundance of rainfall, chemical and biological actions are rapid. The abundant rainfall leaches much of the plant nutrients from the soils.

Plants and Animals

Plants have been the principal biological factors in the formation of soils in this survey area. Animals, insects, bacteria, and fungi also have been important. The plants and animals furnish organic matter and bring plant nutrients from the lower to the upper horizons. Plants and animals cause differences in the amount of organic matter, nitrogen, and plant nutrients in the soils and differences in soil structure and porosity.

Parent Material

The parent material of the soils in Bay County consists of beds of sandy and clayey materials that were transported by floodwaters of major streams and by waters of the sea, which covered the area a number of times during the Pleistocene Epoch. During the high stands of the sea, the Mio-Pliocene sediments were eroded and redeposited or were reworked on the shallow sea bottom to form marine terraces. Also, flood plain sediments from higher lying uplands were deposited on the marine terraces and in the sea itself to form landmass or were reworked and mixed with the marine terrace sediments.

Nearly all of the county is underlain by the Tampa Formation and the Suwannee Limestone. The thickness of the soil mantle over the limestone varies; there are limestone outcroppings around Econfina Creek near Bennett, whereas depth to limestone is over 200 feet in the southern part of the county. The Tampa Formation overlies the Suwannee Limestone from about the center of the county to the northern county line boundary.

The parent materials in the survey area differ slightly in mineral and chemical composition and in physical properties. The main physical differences, such as those between sand, silt, and clay, can be observed in the field. Differences in mineralogical and chemical composition of the parent materials are important to soil formation and to physical and chemical characteristics of the soils. Many differences among soils in the survey area appear to reflect differences in the parent materials.

Relief

Relief has affected the formation of soils in Bay County primarily through its influence on soil-water relationships and its effect on erosion in the northern part of the county. Its influence on other factors of soil formation, such as temperature and plant cover, has been minor.

Some of the differences between soils at the highest elevations and those at the lowest elevations are related to relief. The terraced Coastal Lowland is made up of eight marine terraces of specific elevations above sea level. The Hazelhurst Terrace, in the extreme northern part of the county, is 215 to 300 feet above sea level. The Coharie Terrace occurs at an elevation of 120 to 215 feet. Then, the Sunderland (also called Okefenokee) Terrace occurs at an elevation of 100 to 170 feet. Next are the Wicomico Terrace at 70 to 100 feet; the Penholoway Terrace at 42 to 70 feet; the Talbot Terrace at 25 to 42 feet; the Pamlico Terrace at 8 to 25 feet; and adjacent to the large bays and the Gulf of Mexico, the Silver Bluff Terrace at 0 to 10 feet.

These marine terraces were caused by changes in the sea level.

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, whereas other minerals are chemically inert and change little over long periods of time. The rate of translocation of fine particles within the soil to form horizons varies under different conditions, but the process always involves relatively long periods of time.

In Bay County, the dominant geological materials are inert. The sands are almost pure quartz and are highly resistant to weathering. The finer textured silts and clays are the product of earlier weathering.

In terms of geological time, relatively little time has elapsed since the material in which the soils in Bay County developed was laid down by or emerged from the sea. The loamy and clayey horizons formed in place through processes of clay translocation.

Processes of Soil Formation

The differences among horizons in soils in Bay County result from accumulation of organic matter, leaching of carbonates, reduction and transfer of iron, or accumulation of silicate clay minerals, or from more than one of these processes.

Some organic matter has accumulated in the upper layers of most of the soils to form an A1 horizon. The quantity of organic matter is very small in some soils and very large in others.

Leaching of carbonates and salts has occurred in nearly all of the soils. The leaching permitted the subsequent translocation of silicate clay materials in some soils.

Reduction and transfer of iron have occurred in most soils in the survey area except the organic soils. In some of the wet soils, iron has been segregated within the deeper horizons to form reddish brown mottles and concretions.

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Glossary

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—

	Inches
Very low	0 to 3
Low	3 to 6
Medium	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.

Bottom land. The normal flood plain of a stream, subject to flooding.

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.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.
Soft.—When dry, breaks into powder or individual grains under very slight pressure.
Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

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.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.
Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.
Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Excess salts (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

Excess sulfur (in tables). Excessive amount of sulfur in the soil. The sulfur causes extreme acidity if the soil is drained, and the growth of most plants is restricted.

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, and clay.

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.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

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. An explanation of the subdivisions is given in the *Soil Survey Manual.* The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A 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) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Roman numeral II precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

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—

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Sandy loam and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Muck. Dark colored, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

No-tillage. A method of planting crops that involves no seedbed preparation other than opening the soil for the purpose of placing the seed at the intended depth. This usually involves opening a small slit or punching a hole into the soil. There is usually no cultivation during crop production. Chemical weed control is normally used.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

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.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor filter (in tables). Because of rapid permeability the soil may not adequately filter effluent from a waste disposal system.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Rill. A steep sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Salty water (in tables.) Water that is too salty for consumption by livestock.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-size particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio. The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

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 insure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

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. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, are in soils in extremely small amounts. They are essential to plant growth.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to a 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.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

TABLE 1.--FREEZE DATA

[Recorded at Panama City, Florida]

Freeze threshold temperature	Mean date of last spring occurrence	Mean date of first fall occurrence	Mean number of days between dates	Years of record, spring	Number of occurrences in spring	Years of record, fall	Number of occurrences in fall
°F							
32	March 3	November 29	273	30	28	30	28
28	February 8	December 9	312	30	24	30	18
24	January 20	December 23	340	26	18	30	12
20	January 5	December 30	358	26	8	30	4

TABLE 2.--TEMPERATURE AND PRECIPITATION

[Recorded in the period 1925-71 at Panama City Water System, Bay County]

Month	Temperature					Precipitation				
	Normal monthly mean	Daily normal maximum	Daily normal minimum	Mean number of days with temperature of-- 90° F or higher	Mean number of days with temperature of-- 32° F or lower	Normal total	Maximum total	Minimum total	Mean number of days with rainfall of-- 0.10 inch or more	Mean number of days with rainfall of-- 0.50 inch or more
	°F	°F	°F			In	In	In		
January	55.5	59.2	36.2	0	15	4.88	9.80	.40	7	5
February	57.3	59.2	38.4	0	10	4.44	7.95	1.00	7	4
March	61.6	69.6	48.4	0	2	5.80	14.26	1.30	6	4
April	67.9	79.2	58.5	1	0	5.12	11.98	.10	4	3
May	74.9	80.6	62.6	3	0	4.40	9.10	.90	6	3
June	80.8	88.8	67.5	18	0	4.92	10.10	.90	7	3
July	82.0	89.5	73.7	22	0	7.80	15.45	2.00	11	6
August	82.0	89.4	71.0	22	0	6.60	20.15	1.80	14	7
September	79.3	89.4	69.1	15	0	5.00	14.20	1.30	8	4
October	71.3	78.8	53.6	1	0	2.18	5.80	.25	4	2
November	60.8	72.5	48.4	0	1	3.38	7.00	1.00	4	3
December	55.4	63.4	39.0	0	9	5.28	13.80	.60	5	3

TABLE 3.--SOIL RATINGS AND LIMITING PROPERTIES FOR SELECTED USES, BY GENERAL SOIL MAP UNIT

Map unit and component soils[1]	Percentage of map unit[2]	Suitability for--		Potential productivity for pine trees	Degree and kind of limitations for urban uses		
		Cropland	Pasture		Sanitary facilities[3]	Building sites[4]	Recreational areas[5]
1. Kureb-Resota-Mandarin (3 percent)		Poor	Moderate	Moderate	Severe	Slight	Severe.
Kureb	28	Unsuited: droughty, low fertility.	Poor: droughty, low fertility.	Low: equipment limitations, seedling mortality.	Severe: poor filter, too sandy.	Slight	Severe: too sandy.
Resota	28	Poor: droughty, low fertility.	Moderate: droughty, low fertility.	Moderate: equipment limitations, seedling mortality.	Severe: poor filter, wetness, seepage.	Slight	Severe: too sandy.
Mandarin	28	Poor: droughty, low fertility.	Moderate: droughty, low fertility.	Moderate: equipment limitations, seedling mortality.	Severe: wetness, too sandy.	Moderate: wetness.	Severe: too sandy.
Other	16						
2. Lakeland-Foxworth-Centenary (18 percent)		Moderately good	Moderately good	Moderately high	Slight	Slight	Severe.
Lakeland	40	Moderate: droughty, low fertility.	Moderate: droughty, low fertility.	Moderately high: equipment limitations, seedling mortality.	Slight	Slight	Severe: too sandy.
Foxworth	20	Moderately good: droughty, low fertility.	Moderately good: droughty, low fertility.	Moderately high: equipment limitations, seedling mortality.	Severe: wetness, poor filter, seepage.	Slight	Severe: too sandy.
Centenary	10	Moderately good: droughty, low fertility.	Moderately good: droughty, low fertility.	High: equipment limitations, seedling mortality.	Severe: wetness, seepage, too sandy.	Slight	Severe: too sandy.
Other	30						
3. Leefield-Albany-Stilson (9 percent)		Good	Moderately good	Moderately high	Severe	Moderate	Severe.
Leefield	30	Good: wetness.	Good: wetness.	Moderately high: seedling mortality, plant competition.	Severe: wetness, percs slowly.	Moderate: wetness.	Severe: too sandy.

See footnotes at end of table.

TABLE 3.--SOIL RATINGS AND LIMITING PROPERTIES FOR SELECTED USES, BY GENERAL SOIL MAP UNIT--Continued

Map unit and component soils[1]	Percentage of map unit[2]	Suitability for--		Potential productivity for pine trees	Degree and kind of limitations for urban uses		
		Cropland	Pasture		Sanitary facilities[3]	Building sites[4]	Recreational areas[5]
Albany	30	Moderately good: wetness.	Moderately good: wetness.	Moderately high: equipment limitations, seedling mortality.	Severe: wetness.	Moderate: wetness.	Severe: too sandy, flooding.
Stilson	10	Good: wetness.	Moderately good: wetness.	High: equipment limitations.	Severe: wetness.	Slight	Severe: too sandy.
Other	30						
4. Hurricane-Chipley-Albany (14 percent)		Moderately good:	Moderately good:	High	Severe	Moderate	Severe.
Hurricane	45	Moderately good: wetness.	Moderately good: wetness.	High: equipment limitations, seedling mortality.	Severe: wetness, seepage, too sandy.	Moderate: wetness.	Severe: too sandy.
Chipley	18	Moderately good: droughty, low fertility.	Moderately good: droughty, low fertility.	High: equipment limitations, plant competition.	Severe: wetness, poor filter, seepage, too sandy.	Moderate: wetness.	Severe: too sandy.
Albany	17	Moderately good: wetness.	Moderately good: wetness.	High: equipment limitations, seedling mortality.	Severe: wetness.	Moderate: wetness.	Severe: too sandy, flooding.
Other	20						
5. Pottsburg-Leon-Rutlege (23 percent)		Moderate	Moderately good	Moderate	Severe	Severe	Severe.
Pottsburg	35	Moderate: wetness.	Moderately good: wetness.	Moderate: equipment limitations, seedling mortality, windthrow hazard.	Severe: wetness, seepage, too sandy.	Severe: wetness.	Severe: wetness, too sandy.
Leon	30	Moderate: wetness.	Moderately good: wetness.	Moderate: equipment limitations, seedling mortality, windthrow hazard.	Severe: wetness, poor filter, seepage, too sandy.	Severe: wetness.	Severe: wetness, too sandy.
Rutlege	15	Moderate: wetness.	Moderate: wetness.	High: equipment limitations, seedling mortality.	Severe: wetness, flooding, seepage.	Severe: wetness, flooding.	Severe: wetness, flooding, too sandy.
Other	20						

See footnotes at end of table.

TABLE 3.--SOIL RATINGS AND LIMITING PROPERTIES FOR SELECTED USES, BY GENERAL SOIL MAP UNIT--Continued

Map unit and component soils[1]	Percentage of map unit[2]	Suitability for--		Potential productivity for pine trees	Degree and kind of limitations for urban uses		
		Cropland	Pasture		Sanitary facilities[3]	Building sites[4]	Recreational areas[5]
6. Plummer-Pelham (5 percent)		Moderate	Moderate	High	Severe	Severe	Severe
Plummer	50	Moderate: wetness.	Moderate: wetness.	High: equipment limitations, seedling mortality.	Severe: wetness, too sandy.	Severe: wetness.	Severe: wetness, too sandy.
Pelham	25	Moderate: wetness.	Moderate: wetness.	High: equipment limitations, seedling mortality.	Severe: flooding, wetness, seepage.	Severe: flooding, wetness.	Severe: flooding, wetness, too sandy.
Other	25						
7. Pamlico-Rutlege-Dorovan (17 percent)		Unsuited	Unsuited	Moderate	Severe	Severe	Severe.
Pamlico	32	Unsuited: wetness.	Unsuited: wetness.	Moderate: equipment limitations, seedling mortality.	Severe: wetness, flooding.	Severe: wetness, flooding, low strength.	Severe: wetness, flooding.
Rutlege	25	Moderate: wetness.	Moderate: wetness.	High: equipment limitations, seedling mortality.	Severe: wetness, seepage, too sandy.	Severe: wetness.	Severe: wetness, too sandy.
Dorovan	15	Unsuited: wetness.	Unsuited: wetness.	Moderate: equipment limitations, seedling mortality.	Severe: flooding, ponding, poor filter.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding, excess humus.
Other	28						
8. Rutlege-Allanton-Pickney (9 percent)		Moderate	Moderately good	High	Severe	Severe	Severe.
Rutlege	35	Moderate: wetness.	Moderate: wetness.	High: equipment limitations, seedling mortality.	Severe: wetness, seepage, too sandy.	Severe: wetness.	Severe: wetness, too sandy.
Allanton	25	Poor: wetness.	Moderately good: wetness.	Moderately high: equipment limitations, seedling mortality.	Severe: flooding, wetness, seepage.	Severe: flooding, wetness,	Severe: flooding, wetness, too sandy, percs slowly.

See footnotes at end of table.

TABLE 3.--SOIL RATINGS AND LIMITING PROPERTIES FOR SELECTED USES, BY GENERAL SOIL MAP UNIT--Continued

Map unit and component soils[1]	Percentage of map unit[2]	Suitability for--		Potential productivity for pine trees	Degree and kind of limitations for urban uses		
		Cropland	Pasture		Sanitary facilities[3]	Building sites[4]	Recreational areas[5]
Pickney	10	Moderate: wetness.	Moderately good: wetness.	Very high: equipment limitations, seedling mortality.	Severe: flooding, wetness, poor filter.	Severe: flooding, wetness.	Severe: wetness, too sandy.
Other	30						
9. Bayvi-Dirego (2 percent)		Unsuited	Unsuited	Unsuited	Severe	Severe	Severe.
Bayvi	79	Unsuited: wetness, flooding, excess salt.	Unsuited: wetness, flooding, excess salt.	Unsuited	Severe: flooding, wetness, seepage.	Severe: flooding, wetness.	Severe: flooding, wetness, excess salt.
Dirego	21	Unsuited: wetness, flooding, excess salt.	Unsuited: wetness, flooding, excess salt.	Unsuited	Severe: flooding, wetness, poor filter, seepage.	Severe: flooding, wetness, low strength.	Severe: flooding, wetness, excess humus.

1 The percentage in parentheses is the percentage of Bay County made up of the map unit. "Other" represents minor soils in the unit.
2 The percentage estimates are not based on measured acreage.
3 Ratings apply to septic tank absorption fields and trench sanitary landfills.
4 Ratings apply to dwellings without basements, small commercial buildings, and local roads and streets.
5 Ratings apply to camp areas, picnic areas, and playgrounds.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
1	Albany sand, 0 to 2 percent slopes	30,758	6.4
2	Albany sand, 2 to 5 percent slopes	1,188	0.2
3	Blanton fine sand, 0 to 5 percent slopes	7,015	1.5
4	Blanton fine sand, 5 to 8 percent slopes	739	0.2
5	Bonifay sand, 0 to 5 percent slopes	436	0.1
6	Bonifay sand, 5 to 8 percent slopes	364	0.1
9	Lakeland sand, 0 to 5 percent slopes	36,085	7.5
10	Lakeland sand, 5 to 8 percent slopes	1,927	0.4
11	Lakeland sand, 8 to 12 percent slopes	2,915	0.6
12	Leefield sand	18,280	3.8
13	Leon sand	34,958	7.3
15	Stilson sand, 0 to 5 percent slopes	5,454	1.1
16	Stilson sand, 5 to 8 percent slopes	414	0.1
17	Troup sand, 0 to 5 percent slopes	1,085	0.2
18	Troup sand, 5 to 8 percent slopes	530	0.1
19	Troup sand, 8 to 12 percent slopes	459	0.1
20	Foxworth sand, 0 to 5 percent slopes	18,673	3.9
21	Foxworth sand, 5 to 8 percent slopes	2,093	0.4
22	Pamlico-Dorovan complex	31,338	6.5
23	Chipley sand, 0 to 5 percent slopes	11,726	2.4
24	Chipley sand, 5 to 8 percent slopes	334	0.1
25	Hurricane sand	34,638	7.2
26	Centenary sand, 0 to 5 percent slopes	10,812	2.2
27	Mandarin sand	5,195	1.1
28	Allanton sand	12,751	2.6
29	Rutlege sand	43,795	9.1
30	Pottsburg sand	45,709	9.5
31	Osier fine sand	10,238	2.1
32	Plummer sand	16,722	3.5
33	Pelham sand	8,047	1.7
36	Alapaha loamy sand	7,562	1.6
37	Rains sand	2,030	0.4
38	Pansey loamy sand	2,912	0.6
39	Pantego sandy loam	3,675	0.8
40	Arents, 0 to 5 percent slopes	4,939	1.0
41	Dirego muck	2,326	0.5
42	Resota fine sand, 0 to 5 percent slopes	4,640	1.0
43	Urban land	3,013	0.6
44	Beaches	2,018	0.4
45	Kureb sand, 0 to 5 percent slopes	4,823	1.0
46	Sapelo sand	828	0.2
47	Pits	888	0.2
48	Fripp-Corolla complex, 2 to 30 percent slopes	1,978	0.4
50	Pickney fine sand	7,775	1.6
51	Rutlege-Pamlico complex	26,669	5.5
52	Bayvi loamy sand	8,702	1.8
53	Ebro-Dorovan complex	696	0.1
	Water	1,768	0.3
	Total	481,920	100.0

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Map symbol and soil name	Corn	Soybeans	Improved bermudagrass	Bahiagrass	Grass hay
	Bu	Bu	AUM*	AUM*	Tons
1------------------------ Albany	65	25	7.0	6.5	4.5
2------------------------ Albany	75	20	7.0	6.5	4.5
3------------------------ Blanton	60	25	8.0	6.5	---
4------------------------ Blanton	50	20	7.5	6.5	---
5------------------------ Bonifay	50	24	7.5	7.2	---
6------------------------ Bonifay	45	24	7.5	7.2	---
9------------------------ Lakeland	55	20	7.0	7.0	---
10, 11------------------- Lakeland	---	---	6.5	6.5	---
12----------------------- Leefield	85	---	8.7	8.0	5.3
13----------------------- Leon	50	---	---	7.5	---
15----------------------- Stilson	80	35	10.0	7.5	---
16----------------------- Stilson	80	35	10.0	7.5	---
17----------------------- Troup	60	25	7.5	7.2	4.0
18----------------------- Troup	55	22	7.3	7.0	3.5
19----------------------- Troup	---	---	6.5	5.0	3.0
20----------------------- Foxworth	---	---	---	7.5	---
21----------------------- Foxworth	---	---	---	7.5	---
22----------------------- Pamlico-Dorovan	---	---	---	---	---
23----------------------- Chipley	50	20	8.0	7.5	---
24----------------------- Chipley	35	15	8.0	7.5	---
25----------------------- Hurricane	---	20	8.0	7.0	---

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Corn	Soybeans	Improved bermudagrass	Bahiagrass	Grass hay
	Bu	Bu	AUM*	AUM*	Tons
26------------------------ Centenary	65	20	7.5	7.5	---
27------------------------ Mandarin	---	---	---	6.0	---
28------------------------ Allanton	50	25	---	7.5	2.5
29------------------------ Rutlege	---	---	---	---	---
30------------------------ Pottsburg	---	---	7.5	7.0	---
31------------------------ Osier	---	---	---	---	---
32------------------------ Plummer	---	---	6.0	5.0	---
33------------------------ Pelham	75	30	---	6.0	---
36------------------------ Alapaha	---	---	---	5.0	---
37------------------------ Rains	110	40	---	10.0	---
38------------------------ Pansey	---	---	7.0	6.5	---
39------------------------ Pantego	135	50	---	---	---
40------------------------ Arents	---	---	---	---	---
41------------------------ Dirego	---	---	---	---	---
42------------------------ Resota	---	---	---	5.0	---
43**. Urban land					
44**. Beaches					
45------------------------ Kureb	---	---	---	---	---
46------------------------ Sapelo	50	20	---	7.5	---
47**. Pits					
48------------------------ Fripp-Corolla	---	---	---	---	---
50------------------------ Pickney	---	---	---	8.0	---
51------------------------ Rutlege-Pamlico	---	---	---	---	---

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Corn	Soybeans	Improved bermudagrass	Bahiagrass	Grass hay
	Bu	Bu	AUM*	AUM*	Tons
52------------------------- Bayvi	---	---	---	---	---
53------------------------- Ebro-Dorovan	---	---	---	---	---

* 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.--CAPABILITY CLASSES AND SUBCLASSES

[Miscellaneous areas are excluded. Absence of an entry indicates no acreage]

Class	Total acreage	Major management concerns (Subclass)			
		Erosion (e)	Wetness (w)	Soil problem (s)	Climate (c)
		Acres	Acres	Acres	Acres
I	---	---	---	---	---
II	23,734	---	18,280	5,454	---
III	116,745	1,602	77,122	38,021	---
IV	151,079	---	110,934	40,145	---
V	38,598	---	38,598	---	---
VI	77,274	---	62,138	15,136	---
VII	55,775	---	45,321	10,454	---
VIII	11,028	---	11,028	---	---

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Potential productivity: Common trees	Potential productivity: Site index	Trees to plant
1, 2----------------- Albany	2w	Slight	Moderate	Moderate	Slight	Loblolly pine-------- Slash pine---------- Longleaf pine--------	95 85 80	Loblolly pine, slash pine.
3, 4----------------- Blanton	3s	Slight	Moderate	Moderate	Slight	Slash pine---------- Loblolly pine-------- Longleaf pine-------- Bluejack oak--------- Turkey oak---------- Southern red oak----- Live oak------------	90 80 70 --- --- --- ---	Slash pine, loblolly pine.
5, 6----------------- Bonifay	3s	Slight	Moderate	Moderate	Slight	Slash pine---------- Longleaf pine-------- Loblolly pine--------	80 65 80	Slash pine.
9, 10, 11----------- Lakeland	3s	Slight	Moderate	Moderate	Slight	Slash pine---------- Loblolly pine-------- Longleaf pine-------- Turkey oak---------- Blackjack oak-------- Post oak------------	80 80 65 --- --- ---	Slash pine, loblolly pine.
12----------------- Leefield	3w	Slight	Moderate	Moderate	---------	Loblolly pine-------- Slash pine---------- Longleaf pine--------	84 84 70	Loblolly pine, slash pine.
13----------------- Leon	4w	Slight	Moderate	Moderate	Moderate	Slash pine---------- Longleaf pine--------	70 65	Slash pine.
15, 16------------- Stilson	2w	Slight	Moderate	Slight	Slight	Loblolly pine-------- Slash pine---------- Longleaf pine-------- Sweetgum------------	95 95 80 ---	Slash pine, loblolly pine, longleaf pine.
17, 18, 19--------- Troup	3s	Slight	Moderate	Moderate	Slight	Loblolly pine-------- Longleaf pine-------- Slash pine----------	82 64 84	Loblolly pine, longleaf pine, slash pine.
20, 21------------- Foxworth	3s	Slight	Moderate	Moderate	Slight	Slash pine---------- Longleaf pine-------- Turkey oak---------- Live oak------------ Post oak------------ Bluejack oak--------- Flowering dogwood---	80 65 --- --- --- --- ---	Slash pine.
22*:								
Pamlico-----------	4w	Slight	Severe	Severe	---------	Slash pine---------- Pond pine----------- Baldcypress--------- Water tupelo--------	70 55 --- ---	Slash pine, loblolly pine, water tupelo.
Dorovan-----------	4w	Slight	Severe	Severe	---------	Blackgum------------ Sweetbay------------	70 ---	Baldcypress.
23, 24------------- Chipley	2s	Slight	Moderate	Slight	Slight	Slash pine---------- Loblolly pine-------- Longleaf pine-------- Post oak------------ Turkey oak---------- Blackjack oak--------	90 90 80 --- --- ---	Slash pine, loblolly pine.

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Trees to plant
25----------------- Hurricane	2w	Slight	Moderate	Moderate	Slight	Slash pine---------- Longleaf pine------- Turkey oak---------- Bluejack oak-------- Post oak------------	90 75 --- --- ---	Slash pine.
26----------------- Centenary	2w	Slight	Moderate	Moderate	Slight	Slash pine---------- Loblolly pine------- Longleaf pine-------	85 85 72	Slash pine, loblolly pine.
27----------------- Mandarin	4s	Slight	Moderate	Severe	Slight	Slash pine---------- Longleaf pine-------	70 60	Slash pine, sand pine.
28----------------- Allanton	3w	Slight	Severe	Severe	Slight	Slash pine---------- Longleaf pine------- Sweetgum------------ Sweetbay------------ Blackgum------------	80 70 90 --- ---	Slash pine, loblolly pine.
29----------------- Rutlege	2w	Slight	Severe	Severe	Slight	Loblolly pine------- Sweetgum------------ Pin oak-------------	90 90 85	Loblolly pine, baldcypress, slash pine.
30----------------- Pottsburg	4w	Slight	Moderate	Moderate	Moderate	Slash pine---------- Longleaf pine-------	70 60	Slash pine.
31----------------- Osier	3w	Slight	Severe	Severe	--------	Slash pine---------- Loblolly pine------- Longleaf pine-------	85 87 69	Slash pine, loblolly pine.
32----------------- Plummer	2w	Slight	Severe	Severe	--------	Slash pine---------- Loblolly pine------- Longleaf pine-------	88 91 70	Loblolly pine, slash pine.
33----------------- Pelham	2w	Slight	Severe	Severe	--------	Slash pine---------- Loblolly pine------- Longleaf pine------- Sweetgum------------ Blackgum------------ Water oak-----------	90 90 80 80 80 80	Slash pine, loblolly pine.
36----------------- Alapaha	2w	Slight	Moderate	Slight	--------	Slash pine---------- Loblolly pine------- Longleaf pine-------	87 87 70	Slash pine, loblolly pine.
37----------------- Rains	2w	Slight	Severe	Severe	--------	Loblolly pine------- Slash pine---------- Sweetgum------------	94 91 90	Loblolly pine, slash pine, sweetgum, American sycamore.
38----------------- Pansey	3w	Slight	Severe	Severe	Slight	Slash pine---------- Loblolly pine------- Sweetgum------------ Water oak-----------	83 83 80 80	Slash pine, loblolly pine, sweetgum, water oak.
39----------------- Pantego	1w	Slight	Severe	Severe	--------	Loblolly pine------- Slash pine---------- Pond pine----------- Baldcypress--------- Water tupelo-------- Water oak-----------	98 95 73 --- --- ---	Loblolly pine, slash pine, sweetgum, American sycamore, water tupelo.
40----------------- Arents	5s	Slight	Severe	Moderate	Slight	Sand pine-----------	50	Sand pine.
42----------------- Resota	4s	Slight	Moderate	Severe	Slight	Slash pine---------- Longleaf pine------- Sand pine-----------	70 65 60	Sand pine.

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Trees to plant
45----------------- Kureb	5s	Slight	Severe	Severe	--------	Longleaf pine------- Slash pine---------- Sand pine-----------	52 --- ---	Sand pine, longleaf pine, slash pine.
46----------------- Sapelo	3w	Slight	Moderate	Moderate	--------	Loblolly pine------- Slash pine---------- Longleaf pine-------	77 77 65	Loblolly pine, slash pine.
48*: Fripp-------------	4s	Slight	Moderate	Moderate	Slight	Slash pine---------- Longleaf pine------- Loblolly pine------- Sand pine----------- Live oak------------	70 60 70 --- ---	Slash pine, longleaf pine, loblolly pine, sand pine.
Corolla-----------	---	--------	--------	--------	--------	--------------------	---	None.
50----------------- Pickney	1w	Slight	Severe	Severe	Moderate	Baldcypress--------- Water tupelo-------- Sweetgum------------ Water oak----------- Water tupelo-------- Loblolly pine------- Longleaf pine------- Pond pine----------- Yellow-poplar------- Blackgum------------	--- --- --- --- --- 100 70 --- --- ---	Baldcypress, water tupelo, sweetgum, loblolly pine, longleaf pine, yellow-poplar.
51*: Rutlege-----------	2w	Slight	Severe	Severe	Slight	Loblolly pine------- Sweetgum------------ Pin oak-------------	90 90 85	Loblolly pine, baldcypress.
Pamlico-----------	4w	Slight	Severe	Severe	--------	Slash pine---------- Pond pine----------- Baldcypress--------- Water tupelo--------	70 55 --- ---	Slash pine, loblolly pine, water tupelo.
53*: Ebro--------------	4w	Slight	Severe	Severe	Severe	Blackgum------------ Baldcypress--------- Water tupelo-------- Sweetgum------------	--- --- --- ---	
Dorovan-----------	4w	Slight	Severe	Severe	--------	Blackgum------------ Sweetbay------------	70 ---	Baldcypress.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
1, 2 Albany	Severe: wetness, too sandy.	Severe: too sandy.	Severe: too sandy, wetness.	Severe: too sandy.	Severe: droughty.
3 Blanton	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
4 Blanton	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Severe: droughty.
5 Bonifay	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
6 Bonifay	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Severe: droughty.
9 Lakeland	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty, too sandy.
10 Lakeland	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Moderate: droughty, too sandy.
11 Lakeland	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Moderate: droughty, slope, too sandy.
12 Leefield	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: wetness, droughty, too sandy.
13 Leon	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
15 Stilson	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty, too sandy.
16 Stilson	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Moderate: droughty, too sandy.
17 Troup	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
18, 19 Troup	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Severe: droughty.
20 Foxworth	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
21 Foxworth	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Moderate: droughty.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
22*:					
Pamlico	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: excess humus, wetness.	Severe: wetness, excess humus.	Severe: wetness, excess humus.
Dorovan	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.	Severe: ponding, flooding, excess humus.
23 Chipley	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
24 Chipley	Severe: too sandy.	Severe: too sandy.	Severe: too sandy, slope.	Severe: too sandy.	Severe: droughty.
25 Hurricane	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy, droughty.
26 Centenary	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
27 Mandarin	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty, too sandy.
28 Allanton	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness, flooding.	Severe: wetness, too sandy.	Severe: wetness, flooding, droughty.
29 Rutlege	Severe: too sandy, ponding.	Severe: too sandy, ponding.	Severe: too sandy, ponding.	Severe: too sandy, ponding.	Severe: ponding.
30 Pottsburg	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
31 Osier	Severe: too sandy, ponding.	Severe: too sandy, ponding.	Severe: too sandy, ponding.	Severe: too sandy, ponding.	Severe: droughty, ponding.
32 Plummer	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
33 Pelham	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness, flooding.	Severe: wetness, too sandy.	Severe: wetness, flooding.
36 Alapaha	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
37 Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
38 Pansey	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
39--------------------- Pantego	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
40--------------------- Arents	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
41--------------------- Dirego	Severe: flooding, wetness, excess humus.	Severe: flooding, wetness, excess humus.	Severe: excess humus, wetness, flooding.	Severe: wetness, excess humus.	Severe: excess salt, excess sulfur, wetness.
42--------------------- Resota	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
43*. Urban land					
44*. Beaches					
45--------------------- Kureb	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
46--------------------- Sapelo	Severe: too sandy, wetness.	Severe: too sandy, wetness.	Severe: too sandy, wetness.	Severe: too sandy, wetness.	Severe: droughty, wetness.
47*. Pits					
48*:					
Fripp-----------------	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Severe: droughty, slope.
Corolla---------------	Severe: flooding, too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
50--------------------- Pickney	Severe: ponding, too sandy.	Severe: ponding, too sandy.	Severe: too sandy, ponding.	Severe: too sandy, ponding.	Severe: ponding.
51*:					
Rutlege---------------	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness, flooding.	Severe: wetness, too sandy.	Severe: wetness, droughty, flooding.
Pamlico---------------	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: excess humus, wetness.	Severe: wetness, excess humus.	Severe: wetness, excess humus.
52--------------------- Bayvi	Severe: flooding, wetness, excess salt.	Severe: flooding, wetness, excess salt.	Severe: wetness, flooding, excess salt.	Severe: wetness, too sandy, flooding.	Severe: excess salt, wetness, flooding.
53*:					
Ebro------------------	Severe: flooding, wetness, excess humus.	Severe: flooding, wetness, excess humus.	Severe: flooding, wetness, excess humus.	Severe: wetness, excess humus.	Severe: wetness, flooding, excess humus.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
53*:					
Dorovan	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.	Severe: ponding, flooding, excess humus.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
1, 2 Albany	Fair	Fair	Fair	Fair	Fair	Fair	Poor	Fair	Fair	Poor.
3, 4 Blanton	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
5, 6 Bonifay	Poor	Fair	Fair	Poor	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
9, 10, 11 Lakeland	Poor	Fair	Fair	Poor	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
12 Leefield	Fair	Fair	Good	Fair	Fair	Fair	Fair	Fair	Fair	Fair.
13 Leon	Poor	Fair	Good	Poor	Fair	Fair	Poor	Fair	Fair	Poor.
15, 16 Stilson	Fair	Fair	Good	Fair	Fair	Poor	Poor	Fair	Fair	Poor.
17, 18, 19 Troup	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
20, 21 Foxworth	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
22*:										
Pamlico	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Dorovan	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
23, 24 Chipley	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
25 Hurricane	Poor	Poor	Fair	Fair	Fair	Poor	Very poor.	Poor	Fair	Very poor.
26 Centenary	Poor	Fair	Fair	Poor	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
27 Mandarin	Very poor.	Poor	Poor	Poor	Fair	Very poor.	Very poor.	Poor	Poor	Very poor.
28 Allanton	Poor	Poor	Poor	Fair	Fair	Good	Good	Poor	Fair	Good.
29 Rutlege	Very poor.	Poor	Poor	Poor	Poor	Fair	Good	Poor	Poor	Fair.
30 Pottsburg	Poor	Poor	Fair	Poor	Poor	Poor	Poor	Poor	Poor	Poor.
31 Osier	Very poor.	Poor	Fair	Fair	Fair	Fair	Good	Poor	Fair	Fair.
32 Plummer	Poor	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair.

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
33 Pelham	Poor	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair.
36 Alapaha	Very poor.	Poor	Fair	Fair	Fair	Fair	Fair	Poor	Fair	Fair.
37 Rains	Fair	Fair	Fair	Good	Good	Good	Good	Fair	Good	Good.
38 Pansey	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
39 Pantego	Fair	Good	Good	Good	Good	Poor	Fair	Good	Good	Poor.
40 Arents	Poor	Poor	Fair	Very poor.	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
41 Dirego	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Fair	Good	Very poor.	Very poor.	Fair.
42 Resota	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
43*. Urban land										
44*. Beaches										
45 Kureb	Very poor.	Poor	Poor	Very poor.	Poor	Very poor.	Very poor.	Poor	Very poor.	Very poor.
46 Sapelo	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Fair	Fair	Fair.
47*. Pits										
48*:										
Fripp	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.
Corolla	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Very poor.	Very poor.
50 Pickney	Poor	Poor	Fair	Fair	Fair	Fair	Good	Poor	Fair	Good.
51*:										
Rutlege	Very poor.	Poor	Poor	Poor	Poor	Fair	Good	Poor	Poor	Fair.
Pamlico	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
52 Bayvi	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Fair	Good	Very poor.	Very poor.	Fair.
53*:										
Ebro	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Dorovan	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition and does not eliminate the need for onsite investigation]

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
1, 2 Albany	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Severe: droughty.
3 Blanton	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Severe: droughty.
4 Blanton	Severe: cutbanks cave.	Slight	Moderate: wetness.	Moderate: slope.	Slight	Severe: droughty.
5 Bonifay	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Severe: droughty.
6 Bonifay	Severe: cutbanks cave.	Slight	Moderate: wetness.	Moderate: slope.	Slight	Severe: droughty.
9 Lakeland	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty, too sandy.
10 Lakeland	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty, too sandy.
11 Lakeland	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope, too sandy.
12 Leefield	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty, too sandy.
13 Leon	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
15 Stilson	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty, too sandy.
16 Stilson	Severe: cutbanks cave.	Slight	Moderate: wetness.	Moderate: slope.	Slight	Moderate: droughty, too sandy.
17 Troup	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Severe: droughty.
18 Troup	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Severe: droughty.
19 Troup	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: droughty.
20 Foxworth	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty.
21 Foxworth	Severe: cutbanks cave.	Slight	Moderate: wetness.	Moderate: slope.	Slight	Moderate: droughty.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
22*:						
Pamlico----------	Severe: cutbanks cave, excess humus, wetness.	Severe: wetness, low strength.	Severe: wetness.	Severe: wetness, low strength.	Severe: wetness.	Severe: wetness, excess humus.
Dorovan----------	Severe: excess humus, ponding.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding.	Severe: flooding, ponding, low strength.	Severe: ponding, flooding.	Severe: ponding, flooding, excess humus.
23---------------- Chipley	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: droughty.
24---------------- Chipley	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: wetness.	Severe: droughty.
25---------------- Hurricane	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: too sandy, droughty.
26---------------- Centenary	Severe: cutbanks cave, wetness.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Severe: droughty.
27---------------- Mandarin	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: droughty, too sandy.
28---------------- Allanton	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding, droughty.
29---------------- Rutlege	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
30---------------- Pottsburg	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
31---------------- Osier	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: droughty, ponding.
32---------------- Plummer	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.
33---------------- Pelham	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.
36---------------- Alapaha	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness.
37---------------- Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
38---------------- Pansey	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness.
39---------------- Pantego	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
40----------------- Arents	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Severe: droughty.
41----------------- Dirego	Severe: cutbanks cave, excess humus, wetness.	Severe: flooding, wetness, low strength.	Severe: flooding, wetness, low strength.	Severe: flooding, wetness, low strength.	Severe: low strength, wetness, flooding.	Severe: excess salt, excess sulfur, wetness.
42----------------- Resota	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Severe: droughty.
43*. Urban land						
44*. Beaches						
45----------------- Kureb	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Severe: droughty.
46----------------- Sapelo	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: droughty, wetness.
47*. Pits						
48*:						
Fripp-------------	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
Corolla-----------	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Moderate: flooding, wetness.	Severe: droughty.
50----------------- Pickney	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
51*:						
Rutlege-----------	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, droughty, flooding.
Pamlico-----------	Severe: cutbanks cave, excess humus, wetness.	Severe: wetness, low strength.	Severe: wetness.	Severe: wetness, low strength.	Severe: wetness.	Severe: wetness, excess humus.
52----------------- Bayvi	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: excess salt, wetness, flooding.
53*:						
Ebro--------------	Severe: excess humus, wetness.	Severe: flooding, wetness, low strength.	Severe: flooding, wetness, low strength.	Severe: flooding, wetness, low strength.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding, excess humus.
Dorovan-----------	Severe: excess humus, ponding.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding.	Severe: flooding, ponding, low strength.	Severe: ponding, flooding.	Severe: ponding, flooding, excess humus.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition and does not eliminate the need for onsite investigation]

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
1, 2 Albany	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: too sandy, wetness.
3, 4 Blanton	Moderate: wetness.	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: too sandy, seepage.
5, 6 Bonifay	Severe: poor filter.	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: too sandy.
9, 10* Lakeland	Slight	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
11 Lakeland	Moderate: slope.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
12 Leefield	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: wetness.	Severe: seepage, wetness.	Fair: wetness.
13 Leon	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
15, 16 Stilson	Severe: wetness.	Severe: seepage, wetness.	Moderate: wetness.	Severe: seepage.	Fair: wetness.
17, 18 Troup	Slight	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: too sandy.
19 Troup	Moderate: slope.	Severe: seepage, slope.	Severe: too sandy.	Severe: seepage.	Poor: too sandy.
20, 21* Foxworth	Moderate: wetness.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
22**:					
Pamlico	Severe: wetness, poor filter.	Severe: seepage, excess humus, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Dorovan	Severe: flooding, ponding, poor filter.	Severe: flooding, excess humus, ponding.	Severe: flooding, seepage, ponding.	Severe: flooding, ponding.	Poor: ponding, excess humus.
23, 24 Chipley	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: too sandy, seepage.

See footnotes at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
25----------------- Hurricane	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: wetness, seepage, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
26----------------- Centenary	Moderate: wetness.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
27----------------- Mandarin	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: wetness, seepage.	Poor: seepage, too sandy.
28----------------- Allanton	Severe: flooding, wetness.	Severe: seepage, wetness, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
29----------------- Rutlege	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: too sandy, ponding.
30----------------- Pottsburg	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: wetness, seepage.	Poor: too sandy, wetness, seepage.
31----------------- Osier	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
32----------------- Plummer	Severe: wetness, percs slowly.	Severe: seepage, flooding, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
33----------------- Pelham	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, seepage, wetness.	Poor: wetness, too sandy.
36----------------- Alapaha	Severe: flooding, wetness, percs slowly.	Severe: seepage, flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, seepage, wetness.	Poor: wetness.
37----------------- Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
38----------------- Pansey	Severe: flooding, wetness, percs slowly.	Severe: seepage, flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, seepage, wetness.	Poor: wetness.
39----------------- Pantego	Severe: wetness.	Severe: seepage, flooding, wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
40----------------- Arents	Slight-----------	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.

See footnotes at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
41------------------- Dirego	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, excess humus.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, wetness, excess humus.
42*------------------ Resota	Moderate: wetness.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
43**. Urban land					
44**. Beaches					
45------------------- Kureb	Severe: poor filter.	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.
46------------------- Sapelo	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
47**. Pits					
48**: Fripp---------------	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
Corolla-------------	Severe: wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: wetness, seepage.	Severe: seepage, wetness.	Poor: seepage, too sandy.
50------------------- Pickney	Severe: ponding, poor filter.	Severe: ponding, seepage.	Severe: ponding, seepage, too sandy.	Severe: ponding, seepage.	Poor: too sandy, seepage, ponding.
51**: Rutlege-------------	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
Pamlico-------------	Severe: wetness, poor filter.	Severe: seepage, excess humus, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
52------------------- Bayvi	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
53**: Ebro----------------	Severe: flooding, wetness, percs slowly.	Severe: flooding, excess humus, wetness.	Severe: flooding, excess humus, wetness.	Severe: flooding, wetness.	Poor: wetness, excess humus.

See footnotes at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
53**:					
Dorovan------------	Severe: flooding, ponding, poor filter.	Severe: flooding, excess humus, ponding.	Severe: flooding, seepage, ponding.	Severe: flooding, ponding.	Poor: ponding, excess humus.

* Excessive rate of permeability may cause pollution of ground water in areas of high-intensity use.
** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," "probable," and "improbable." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition and does not eliminate the need for onsite investigation]

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
1, 2: Albany	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
3, 4: Blanton	Good	Probable	Improbable: too sandy.	Poor: too sandy.
5, 6: Bonifay	Good	Probable	Improbable: too sandy.	Poor: too sandy.
9, 10, 11: Lakeland	Good	Probable	Improbable: too sandy.	Poor: too sandy.
12: Leefield	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
13: Leon	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
15, 16: Stilson	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
17, 18, 19: Troup	Good	Probable	Improbable: too sandy.	Poor. too sandy.
20, 21: Foxworth	Good	Probable	Improbable: too sandy.	Poor: too sandy.
22*:				
Pamlico	Poor: wetness.	Probable	Improbable: too sandy.	Poor: excess humus, wetness.
Dorovan	Poor: wetness.	Probable	Improbable: too sandy.	Poor: excess humus, wetness.
23, 24: Chipley	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
25: Hurricane	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
26: Centenary	Good	Probable	Improbable: too sandy.	Poor: too sandy.
27: Mandarin	Fair: wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy.
28: Allanton	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
29: Rutlege	Poor: wetness.	Improbable: excess fines.	Improbable: too sandy.	Poor: too sandy, wetness.
30: Pottsburg	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
31-------------------- Osier	Poor: wetness.	Probable-------------	Improbable: too sandy.	Poor: too sandy, wetness.
32-------------------- Plummer	Poor: wetness.	Probable-------------	Improbable: too sandy.	Poor: too sandy, wetness.
33-------------------- Pelham	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, wetness.
36-------------------- Alapaha	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
37-------------------- Rains	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
38-------------------- Pansey	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
39-------------------- Pantego	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
40-------------------- Arents	Good-----------------	Probable-------------	Improbable: too sandy.	Poor: too sandy.
41-------------------- Dirego	Poor: low strength, wetness.	Probable-------------	Improbable: too sandy.	Poor: excess humus, excess salt, wetness.
42-------------------- Resota	Good-----------------	Probable-------------	Improbable: too sandy.	Poor: too sandy.
43*. Urban land				
44*. Beaches				
45-------------------- Kureb	Good-----------------	Probable-------------	Improbable: too sandy.	Poor: too sandy.
46-------------------- Sapelo	Poor: wetness.	Improbable: excess fines.	Improbable: too sandy.	Poor: too sandy, wetness.
47*. Pits				
48*:				
Fripp-----------------	Fair: slope.	Probable-------------	Improbable: too sandy.	Poor: too sandy, slope.
Corolla---------------	Fair: wetness.	Probable-------------	Improbable: too sandy.	Poor: too sandy.
50-------------------- Pickney	Poor: wetness.	Probable-------------	Improbable: too sandy.	Poor: too sandy, wetness.
51*:				
Rutlege---------------	Poor: wetness.	Probable-------------	Improbable: too sandy.	Poor: too sandy, wetness.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
51*:				
Pamlico	Poor: wetness.	Probable	Improbable: too sandy.	Poor: excess humus, wetness.
52 Bayvi	Poor: wetness.	Probable	Improbable: too sandy.	Poor: excess salt, wetness, too sandy.
53*:				
Ebro	Severe: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
Dorovan	Poor: wetness.	Probable	Improbable: too sandy.	Poor: excess humus, wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition and does not eliminate the need for onsite investigation]

Map symbol and soil name	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Grassed waterways
1: Albany	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, droughty.
2: Albany	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Slope, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, droughty.
3, 4: Blanton	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Droughty.
5, 6: Bonifay	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Droughty.
9, 10: Lakeland	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Droughty.
11: Lakeland	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Slope, droughty.
12: Leefield	Moderate: seepage.	Severe: piping, wetness.	Severe: slow refill, cutbanks cave.	Favorable	Wetness, droughty, fast intake.	Droughty.
13: Leon	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, droughty.
15: Stilson	Moderate: seepage.	Severe: piping.	Severe: no water.	Favorable	Wetness, droughty.	Droughty.
16: Stilson	Moderate: seepage.	Severe: piping.	Severe: no water.	Slope	Wetness, droughty, slope.	Droughty.
17: Troup	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake.	Droughty.
18: Troup	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Droughty.
19: Troup	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Slope, droughty.
20, 21: Foxworth	Severe: seepage.	Severe: seepage.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake, soil blowing.	Droughty.
22*:						
Pamlico	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Subsides, cutbanks cave.	Wetness, rooting depth.	Wetness, rooting depth.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Grassed waterways
22*: Dorovan	Moderate: seepage.	Severe: excess humus, ponding.	Severe: cutbanks cave.	Ponding, flooding, subsides.	Ponding, flooding.	Wetness.
23 Chipley	Severe: seepage.	Severe: seepage.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Droughty.
24 Chipley	Severe: seepage.	Severe: seepage.	Severe: cutbanks cave.	Slope, cutbanks cave.	Wetness, droughty, fast intake.	Droughty.
25 Hurricane	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Droughty.
26 Centenary	Severe: seepage.	Severe: seepage.	Severe: cutbanks cave.	Cutbanks cave	Droughty, fast intake, soil blowing.	Droughty.
27 Mandarin	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Droughty.
28 Allanton	Severe: seepage.	Severe: seepage, wetness, piping.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, droughty.
29 Rutlege	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, droughty.	Wetness, droughty.
30 Pottsburg	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, droughty.
31 Osier	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Cutbanks cave, ponding.	Droughty, ponding.	Wetness, droughty.
32 Plummer	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, droughty.
33 Pelham	Severe: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Flooding	Flooding, fast intake.	Wetness.
36 Alapaha	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, flooding.	Wetness, droughty.
37 Rains	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Favorable	Wetness, fast intake, soil blowing.	Wetness.
38 Pansey	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Percs slowly, flooding.	Wetness, fast intake, percs slowly.	Wetness, percs slowly.
39 Pantego	Moderate: seepage.	Severe: wetness.	Moderate: slow refill.	Favorable	Wetness	Wetness.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Grassed waterways
40------------------ Arents	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Droughty.
41------------------ Dirego	Severe: seepage.	Severe: seepage, excess humus, wetness.	Severe: salty water, cutbanks cave.	Flooding, subsides, excess salt.	Wetness, soil blowing, flooding.	Wetness, excess salt.
42------------------ Resota	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water, cutbanks cave.	Droughty, fast intake, soil blowing.	Droughty.
43*. Urban land						
44*. Beaches						
45------------------ Kureb	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Droughty.
46------------------ Sapelo	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Droughty, wetness.
47*. Pits						
48*:						
Fripp------------	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Slope, droughty.
Corolla----------	Severe: seepage.	Severe: seepage, wetness, piping.	Severe: cutbanks cave.	Slope, cutbanks cave.	Wetness, droughty, fast intake.	Droughty.
50------------------ Pickney	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Cutbanks cave, ponding.	Droughty, fast intake, ponding.	Wetness, droughty.
51*:						
Rutlege----------	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, droughty.
Pamlico----------	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Subsides, cutbanks cave.	Wetness, rooting depth.	Wetness, rooting depth.
52------------------ Bayvi	Severe: seepage.	Severe: seepage, wetness, excess salt.	Severe: salty water, cutbanks cave.	Flooding, cutbanks cave, excess salt.	Wetness, flooding, excess salt.	Wetness, excess salt.
53*:						
Ebro-------------	Moderate: seepage.	Severe: excess humus, wetness.	Slight----------	Flooding, subsides.	Wetness, soil blowing, flooding.	Wetness.
Dorovan----------	Moderate: seepage.	Severe: excess humus, ponding.	Severe: cutbanks cave.	Ponding, flooding, subsides.	Ponding, flooding.	Wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Map symbol and soil name	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1----------------- Albany	0-54	Sand--------------	SM	A-2	0	100	100	75-90	12-23	---	NP
	54-60	Sandy loam--------	SM	A-2	0	100	100	75-92	22-30	---	NP
	60-80	Sandy clay loam, sandy loam, fine sandy loam.	SC, SM, SM-SC	A-2, A-4, A-6	0	97-100	95-100	70-100	25-50	<40	NP-17
2----------------- Albany	0-48	Sand--------------	SM	A-2	0	100	100	75-90	12-23	---	NP
	48-60	Sandy loam--------	SM	A-2	0	100	100	75-92	22-30	---	NP
	60-80	Sandy clay loam, sandy loam, fine sandy loam.	SC, SM, SM-SC	A-2, A-4, A-6	0	97-100	95-100	70-100	25-50	<40	NP-17
3, 4-------------- Blanton	0-58	Fine sand---------	SP-SM	A-3, A-2-4	0	100	100	65-100	5-12	---	NP
	58-62	Sandy loam, loamy sand, loamy coarse sand.	SM	A-2-4	0	100	100	65-96	13-30	<25	NP-3
	62-80	Sandy clay loam, sandy loam, fine sandy loam.	SC, SM-SC, SM	A-4, A-2-4, A-2-6, A-6	0	100	100	69-96	25-50	<45	3-22
5----------------- Bonifay	0-54	Sand--------------	SP-SM	A-3, A-2-4	0	98-100	98-100	60-95	5-12	---	NP
	54-58	Sandy loam, sandy clay loam.	SM-SC, SC, SM	A-2-4, A-4	0	95-100	90-100	63-95	23-50	<30	NP-12
	58-80	Sandy clay loam, sandy clay.	SM-SC, SC	A-2, A-4, A-6, A-7	0	95-100	90-100	60-95	30-50	25-45	5-22
6----------------- Bonifay	0-48	Sand--------------	SP-SM	A-3, A-2-4	0	98-100	98-100	60-95	5-12	---	NP
	48-54	Sandy loam, sandy clay loam.	SM-SC, SC, SM	A-2-4, A-4	0	95-100	90-100	63-95	23-50	<30	NP-12
	54-80	Sandy clay loam, sandy clay.	SM-SC, SC	A-2, A-4, A-6, A-7	0	95-100	90-100	60-95	30-50	25-45	5-22
9----------------- Lakeland	0-42	Sand--------------	SP-SM	A-3, A-2-4	0	90-100	90-100	60-100	5-12	---	NP
	42-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	90-100	90-100	50-100	1-12	---	NP
10---------------- Lakeland	0-37	Sand--------------	SP-SM	A-3, A-2-4	0	90-100	90-100	60-100	5-12	---	NP
	37-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	90-100	90-100	50-100	1-12	---	NP
11---------------- Lakeland	0-42	Sand--------------	SP-SM	A-3, A-2-4	0	90-100	90-100	60-100	5-12	---	NP
	42-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	90-100	90-100	50-100	1-12	---	NP
12---------------- Leefield	0-28	Sand--------------	SM, SW-SM, SP-SM	A-2	0	98-100	95-100	65-95	10-20	---	NP
	28-36	Sandy loam, sandy clay loam.	SC, SM, SM-SC	A-2, A-4, A-6	0	95-100	93-100	65-95	20-40	<40	NP-16
	36-80	Sandy loam, sandy clay loam.	SC, SM, SM-SC	A-2, A-4, A-6	0	95-100	95-100	65-90	20-40	<40	NP-20
13---------------- Leon	0-15	Sand--------------	SP, SP-SM	A-3, A-2-4	0	100	100	78-100	2-12	---	NP
	15-30	Sand, fine sand, loamy sand.	SM, SP-SM, SP	A-3, A-2-4	0	100	100	78-100	3-20	---	NP
	30-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	78-100	2-12	---	NP

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
15, 16----------- Stilson	0-34	Sand--------------	SM	A-2	0	94-100	94-100	74-92	15-24	---	NP
	34-58	Sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-6, A-4	0	89-100	86-100	77-94	28-41	<29	NP-13
	58-80	Sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-6, A-4	0	96-100	95-100	70-99	30-50	<40	NP-20
17--------------- Troup	0-48	Sand--------------	SM, SP-SM	A-2	0	100	100	50-75	10-30	---	NP
	48-80	Sandy clay loam, sandy loam, fine sandy loam.	SC, SM-SC, CL-ML, CL	A-4, A-2	0	95-100	95-100	60-90	24-55	19-34	4-12
18--------------- Troup	0-56	Sand--------------	SM, SP-SM	A-2	0	100	100	50-75	10-30	---	NP
	56-80	Sandy clay loam, sandy loam, fine sandy loam.	SC, SM-SC, CL-ML, CL	A-4, A-2	0	95-100	95-100	60-90	24-55	19-34	4-12
19--------------- Troup	0-52	Sand--------------	SM, SP-SM	A-2	0	100	100	50-75	10-30	---	NP
	52-80	Sandy clay loam, sandy loam, fine sandy loam.	SC, SM-SC, CL-ML, CL	A-4, A-2	0	95-100	95-100	60-90	24-55	19-34	4-12
20, 21----------- Foxworth	0-8	Sand--------------	SP-SM	A-3, A-2-4	0	100	100	60-100	5-12	---	NP
	8-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	50-100	1-12	---	NP
22*:											
Pamlico---------	0-32	Muck--------------	PT	A-8	0	---	---	---	---	---	---
	32-80	Loamy sand, sand, loamy fine sand.	SM, SP-SM	A-2, A-3	0	100	100	70-95	5-20	---	NP
Dorovan---------	0-60	Muck--------------	PT	A-8	0	---	---	---	---	---	---
	60-80	Sand, loamy sand, loam.	SP-SM, SM-SC, SM	A-1, A-3, A-4, A-2-4	0	100	100	5-70	5-49	<20	NP-7
23--------------- Chipley	0-8	Sand--------------	SP-SM	A-3, A-2-4	0	100	100	80-100	6-12	---	NP
	8-80	Sand, fine sand	SP-SM	A-3, A-2-4	0	100	100	80-100	6-12	---	NP
24--------------- Chipley	0-7	Sand--------------	SP-SM	A-3, A-2-4	0	100	100	80-100	6-12	---	NP
	7-80	Sand, fine sand	SP-SM	A-3, A-2-4	0	100	100	80-100	6-12	---	NP
25--------------- Hurricane	0-51	Sand--------------	SP, SP-SM	A-3	0	100	100	78-100	4-8	---	NP
	51-55	Sand, fine sand, loamy sand.	SP-SM, SM	A-3, A-2-4	0	100	100	80-100	5-15	---	NP
	55-80	Sand, fine sand	SP, SP-SM, SM	A-3, A-2-4	0	100	100	90-100	4-15	---	NP
26--------------- Centenary	0-9	Sand--------------	SP, SP-SM	A-3	0	100	100	60-90	4-10	---	NP
	9-73	Sand, fine sand, loamy sand.	SP-SM, SP, SM	A-3, A-2-4	0	100	100	65-90	4-20	---	NP
	73-80	Sand, fine sand, loamy sand.	SP, SP-SM, SM	A-3, A-2-4	0	100	100	60-90	3-20	---	NP
27--------------- Mandarin	0-25	Sand--------------	SP, SP-SM, SW-SM	A-3	0	100	100	90-100	2-10	---	NP
	25-57	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	100	100	90-100	5-15	---	NP
	57-80	Fine sand, sand	SP, SP-SM, SW-SM	A-3	0	100	100	90-100	2-7	---	NP

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
28----------------- Allanton	0-18	Sand--------------	SP-SM	A-3, A-2-4	0	100	100	50-70	5-12	---	NP
	18-52	Sand, fine sand	SP-SM	A-3, A-2-4	0	100	100	50-70	5-12	---	NP
	52-80	Sand, fine sand, loamy sand.	SP, SP-SM	A-3	0	100	100	65-85	1-10	---	NP
29----------------- Rutlege	0-22	Sand--------------	SP-SM, SM	A-2, A-3	---	95-100	95-100	50-80	5-10	---	NP
	22-80	Sand, loamy sand, loamy fine sand.	SP-SM, SP, SM	A-2, A-3	0	95-100	95-100	50-80	2-25	---	NP
30----------------- Pottsburg	0-64	Sand--------------	SP-SM	A-3, A-2-4	0	100	100	90-100	5-18	---	NP
	64-80	Sand, fine sand	SP-SM	A-3, A-2-4	0	100	100	90-100	4-18	---	NP
31----------------- Osier	0-8	Fine sand---------	SP-SM	A-2, A-3	0	100	98-100	60-85	5-12	---	NP
	8-61	Sand, loamy sand, loamy fine sand.	SP-SM, SM	A-2, A-3	0	100	95-100	65-90	5-20	---	NP
	61-80	Coarse sand, sand, fine sand.	SP, SP-SM	A-1, A-3, A-2-4	0	100	90-100	40-60	2-10	---	NP
32----------------- Plummer	0-48	Sand--------------	SM, SP-SM	A-2-4, A-3	0	100	100	75-96	5-26	---	NP
	48-80	Sandy loam, sandy clay loam, fine sandy loam.	SM, SC, SM-SC	A-2-4, A-2-6, A-4	0	100	97-100	76-96	20-48	<30	NP-10
33----------------- Pelham	0-34	Sand--------------	SM	A-2	0	100	95-100	75-90	10-25	---	NP
	34-38	Sandy clay loam, sandy loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	100	95-100	65-90	30-50	15-30	2-12
	38-80	Sandy clay loam, sandy loam, sandy clay.	SC, SM-SC, ML, CL	A-2, A-4, A-6, A-7	0	100	95-100	65-90	30-65	20-45	5-20
36----------------- Alapaha	0-32	Loamy sand--------	SM	A-2	0	100	99-100	70-95	15-31	---	NP
	32-80	Sandy loam, sandy clay loam.	SC, SM-SC	A-2, A-4	0	99-100	98-100	70-95	30-45	19-30	5-10
37----------------- Rains	0-13	Sand--------------	SM	A-2	0	100	95-100	55-98	15-35	<30	NP-4
	13-58	Sandy clay loam, clay loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0	100	95-100	55-98	30-70	18-40	4-20
	58-73	Sandy clay loam, clay loam, sandy clay.	SC, SM-SC, CL, CL-ML	A-4, A-6, A-7	0	100	98-100	60-98	36-72	18-45	4-28
	73-80	Variable----------	---	---	---	---	---	---	---	---	---
38----------------- Pansey	0-18	Loamy sand--------	SM	A-2, A-4	0	100	95-100	80-100	15-45	---	NP
	18-62	Sandy clay loam	SM-SC, SM, SC	A-2, A-4, A-6	0	100	95-100	70-95	30-50	<34	NP-14
	62-80	Sandy clay loam, sandy clay.	SM-SC, SM, SC	A-2, A-4, A-6	0	100	95-100	70-95	25-50	<30	NP-14
39----------------- Pantego	0-18	Sandy loam--------	SM, SM-SC, CL, ML	A-2, A-4	0	100	95-100	60-95	25-75	<35	NP-10
	18-32	Sandy clay loam, sandy loam, clay loam.	SC, CL, SM-SC, CL-ML	A-4, A-6, A-2	0	100	95-100	80-100	30-80	20-40	4-16
	32-80	Clay loam, sandy clay, sandy clay loam.	CL, SC	A-6, A-7	0	100	95-100	90-100	36-80	25-49	11-24
40----------------- Arents	0-80	Sand--------------	SP, SP-SM	A-3	0	100	100	85-99	0-5	---	NP
41----------------- Dirego	0-28	Muck--------------	PT	A-8	0	---	---	---	---	---	---
	28-80	Fine sand, loamy fine sand, fine sandy loam.	SM, SP-SM	A-3, A-2-4	0	100	100	80-100	6-13	---	NP

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
42--------------- Resota	0-80	Fine sand--------	SP	A-3, A-2-4	0	100	100	90-99	1-15	---	NP
43*. Urban land											
44*. Beaches											
45--------------- Kureb	0-80	Sand-------------	SP, SP-SM	A-3	0	100	100	60-100	0-7	---	NP
46--------------- Sapelo	0-20	Sand-------------	SM, SP, SP-SM	A-2, A-3	0	100	100	90-100	4-20	---	NP
	20-27	Fine sand, sand, loamy fine sand.	SM, SP-SM	A-2, A-3	0	100	100	95-100	8-20	---	NP
	27-58	Fine sand, sand	SM, SP, SP-SM	A-2, A-3	0	100	100	90-100	4-15	---	NP
	58-80	Sandy loam, sandy clay loam, fine sandy loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	100	100	90-100	20-50	<40	NP-20
47*. Pits											
48*: Fripp------------	0-3	Sand-------------	SP, SP-SM	A-3	0	100	98-100	85-99	0-5	---	NP
	3-80	Fine sand, sand	SP, SP-SM	A-3	0	100	98-100	85-99	0-5	---	NP
Corolla----------	0-80	Sand-------------	SW, SP-SM, SP	A-2, A-3	0	100	98-100	60-75	3-12	---	NP
50--------------- Pickney	0-30	Fine sand--------	SM, SP-SM	A-2	0	100	100	50-90	10-25	---	NP
	30-80	Loamy fine sand, loamy sand, fine sand.	SP, SP-SM, SM	A-2, A-3	0	100	100	50-90	3-25	---	NP
51*: Rutlege----------	0-22	Sand-------------	SM, SP-SM	A-2, A-3	0	95-100	95-100	50-80	5-35	<25	NP
	22-80	Sand, loamy sand, loamy fine sand.	SP-SM, SP, SM	A-2, A-3	0	95-100	95-100	50-80	2-25	<20	NP
Pamlico----------	0-30	Muck-------------	PT	A-8	0	---	---	---	---	---	---
	30-80	Loamy sand, sand, loamy fine sand.	SM, SP-SM	A-2, A-3	0	100	100	70-95	5-20	---	NP
52--------------- Bayvi	0-28	Loamy sand-------	SM, SP-SM	A-3, A-2-4	0	100	100	80-100	5-20	---	NP
	28-80	Loamy sand, fine sand, sand.	SM, SP-SM	A-3, A-2-4	0	100	100	80-100	5-20	---	NP
53*: Ebro-------------	0-80	Muck-------------	PT	A-8	---	---	---	---	---	---	---
Dorovan----------	0-60	Muck-------------	PT	A-8	0	---	---	---	---	---	---
	60-80	Sand, loamy sand, loam.	SP-SM, SM-SC, SM	A-1, A-3, A-4, A-2-4	0	100	100	5-70	5-49	<20	NP-7

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated. The data in this table are representative of the soil series but are not all inclusive; for specific sites, some data may fall outside the ranges provided]

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Salinity	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	G/cm3	In/hr	In/in	pH	Mmhos/cm					Pct
1----------------- Albany	0-54	1-10	---	6.0-20	0.02-0.04	3.6-6.5	<2	Low--------	0.10	5	2	1-2
	54-60	10-20	---	2.0-6.0	0.08-0.10	4.5-6.0	<2	Low--------	0.20			
	60-80	15-35	---	0.6-2.0	0.10-0.16	4.5-6.0	<2	Low--------	0.24			
2----------------- Albany	0-48	1-10	---	6.0-20	0.02-0.04	3.6-6.5	<2	Low--------	0.10	5	2	1-2
	48-60	10-20	---	2.0-6.0	0.08-0.10	4.5-6.0	<2	Low--------	0.20			
	60-80	15-35	---	0.6-2.0	0.10-0.16	4.5-6.0	<2	Low--------	0.24			
3----------------- Blanton	0-60	1-7	1.30-1.60	6.0-20	0.03-0.07	4.5-6.0	<2	Low--------	0.10	5	2	.5-1
	60-80	10-18	1.53-1.65	2.0-6.0	0.10-0.15	4.5-5.5	<2	Low--------	0.15			
4----------------- Blanton	0-58	1-7	1.30-1.60	6.0-20	0.03-0.07	4.5-6.0	<2	Low--------	0.10	5	2	.5-1
	58-62	10-18	1.53-1.65	2.0-6.0	0.10-0.15	4.5-5.5	<2	Low--------	0.15			
	62-80	12-30	1.60-1.70	0.6-2.0	0.10-0.15	4.5-5.5	<2	Low--------	0.20			
5----------------- Bonifay	0-54	3-9	1.35-1.60	6.0-20	0.03-0.08	4.5-6.5	<2	Low--------	0.10	5	2	1-3
	54-58	15-35	1.60-1.70	0.6-2.0	0.10-0.15	4.5-6.5	<2	Low--------	0.24			
	58-80	20-45	1.60-1.70	0.2-0.6	0.10-0.15	4.5-6.5	<2	Low--------	0.24			
6----------------- Bonifay	0-48	3-9	1.35-1.60	6.0-20	0.03-0.08	4.5-6.5	<2	Low--------	0.10	5	2	1-3
	48-54	15-35	1.60-1.70	0.6-2.0	0.10-0.15	4.5-6.5	<2	Low--------	0.24			
	54-80	20-45	1.60-1.70	0.2-0.6	0.10-0.15	4.5-6.5	<2	Low--------	0.24			
9----------------- Lakeland	0-42	2-8	1.35-1.65	6.0-20	0.05-0.09	4.5-6.0	<2	Low--------	0.10	5	2	<1
	42-80	1-6	1.50-1.60	6.0-20	0.02-0.08	4.5-6.0	<2	Low--------	0.10			
10---------------- Lakeland	0-37	2-8	1.35-1.65	6.0-20	0.05-0.09	4.5-6.0	<2	Low--------	0.10	5	2	<1
	37-80	1-6	1.50-1.60	6.0-20	0.02-0.08	4.5-6.0	<2	Low--------	0.10			
11---------------- Lakeland	0-42	2-8	1.35-1.65	6.0-20	0.05-0.09	4.5-6.0	<2	Low--------	0.10	5	2	<1
	42-80	1-6	1.50-1.60	6.0-20	0.02-0.08	4.5-6.0	<2	Low--------	0.10			
12---------------- Leefield	0-28	5-10	---	6.0-20	0.04-0.07	4.5-6.0	<2	Low--------	0.10	5	2	1-2
	28-36	15-25	---	0.6-2.0	0.10-0.13	4.5-5.5	<2	Low--------	0.15			
	36-80	15-30	---	0.2-0.6	0.08-0.12	4.5-5.5	<2	Low--------	0.10			
13---------------- Leon	0-15	1-6	1.40-1.65	6.0-20	0.02-0.05	3.6-5.5	<2	Low--------	0.10	5	1	.5-4
	15-30	2-8	1.50-1.70	0.6-6.0	0.05-0.10	3.6-5.5	<2	Low--------	0.15			
	30-80	1-6	1.40-1.65	0.6-6.0	0.02-0.05	3.6-5.5	<2	Low--------	0.10			
15, 16------------ Stilson	0-34	3-8	1.35-1.70	6.0-20	0.06-0.09	4.5-5.5	<2	Low--------	0.10	5	2	.5-1
	34-58	15-30	1.40-1.70	0.6-2.0	0.09-0.12	4.5-5.5	<2	Low--------	0.24			
	58-80	18-35	1.40-1.70	0.6-2.0	0.08-0.10	4.5-5.5	<2	Low--------	0.17			
17---------------- Troup	0-48	1-10	---	6.0-20	0.03-0.10	4.5-5.5	<2	Very low	0.10	5	2	<1
	48-80	15-35	---	0.6-2.0	0.10-0.13	4.5-5.5	<2	Low--------	0.20			
18---------------- Troup	0-56	1-10	---	6.0-20	0.03-0.10	4.5-5.5	<2	Very low	0.10	5	2	<1
	56-80	15-35	---	0.6-2.0	0.10-0.13	4.5-5.5	<2	Low--------	0.20			
19---------------- Troup	0-52	1-10	---	6.0-20	0.03-0.10	4.5-5.5	<2	Very low	0.10	5	2	<1
	52-80	15-35	---	0.6-2.0	0.10-0.13	4.5-5.5	<2	Low--------	0.20			
20, 21------------ Foxworth	0-8	1-8	1.25-1.55	>20	0.02-0.10	4.5-6.0	<2	Low--------	0.10	5	2	>1
	8-80	1-6	1.40-1.60	>20	0.02-0.08	4.5-6.0	<2	Low--------	0.10			
22*:												
Pamlico----------	0-32	---	0.40-0.65	0.6-6.0	0.24-0.26	3.6-4.4	<2	Low--------	0.10	2	2	20-80
	32-80	5-10	1.60-1.75	6.0-20	0.03-0.06	3.6-5.5	<2	Low--------	0.10			
Dorovan----------	0-60	---	0.35-0.55	0.6-2.0	0.25-0.50	3.6-4.4	<2	-----------	0.10	2	2	---
	60-80	5-20	1.40-1.65	6.0-20	0.05-0.08	4.5-5.5	<2	Low--------	0.10			

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	G/cm3	In/hr	In/in	pH	Mmhos/cm					Pct
23---------------- Chipley	0-8	1-5	1.35-1.45	6.0-20	0.05-0.10	3.6-6.0	<2	Low--------	0.10	5	2	2-5
	8-80	1-7	1.45-1.60	6.0-20	0.03-0.08	4.5-6.5	<2	Low--------	0.10			
24---------------- Chipley	0-7	1-5	1.35-1.45	6.0-20	0.05-0.10	3.6-6.0	<2	Low--------	0.10	5	2	2-5
	7-80	1-7	1.45-1.60	6.0-20	0.03-0.08	4.5-6.5	<2	Low--------	0.10			
25---------------- Hurricane	0-51	1-4	1.40-1.60	>6.0	0.03-0.07	4.5-6.0	<2	Low--------	0.10	5	1	<2
	51-55	2-8	1.55-1.65	2.0-6.0	0.10-0.15	4.5-6.0	<2	Low--------	0.15			
	55-80	1-4	1.40-1.60	2.0-20	0.03-0.10	4.5-6.0	<2	Low--------	0.10			
26---------------- Centenary	0-9	1-8	1.40-1.60	6.0-20	0.03-0.08	4.5-6.5	<2	Low--------	0.10	5	1	<1
	9-73	2-8	1.40-1.60	6.0-20	0.03-0.05	4.5-6.0	<2	Low--------	0.10			
	73-80	2-10	1.50-1.70	2.0-6.0	0.03-0.08	4.5-6.0	<2	Low--------	0.10			
27---------------- Mandarin	0-25	<3	1.35-1.45	6.0-20	0.03-0.07	3.6-6.0	<2	Low--------	0.10	5	2	<3
	25-57	2-9	1.45-1.60	0.6-2.0	0.10-0.15	3.6-6.0	<2	Low--------	0.15			
	57-80	<3	1.35-1.45	6.0-20	0.03-0.07	4.5-7.3	<2	Low--------	0.10			
28---------------- Allanton	0-18	1-3	1.35-1.60	2.0-6.0	0.02-0.06	4.5-5.5	<2	Low--------	0.10	5	1	1-3
	18-52	1-3	1.35-1.60	2.0-6.0	0.02-0.06	4.5-5.5	<2	Low--------	0.10			
	52-80	1-3	1.40-1.55	2.0-6.0	0.02-0.06	3.6-5.5	<2	Low--------	0.10			
29---------------- Rutlege	0-22	<10	1.00-1.20	6.0-20	0.04-0.06	3.6-5.5	<2	Low--------	0.17	5	2	3-15
	22-80	<10	1.40-1.60	6.0-20	0.04-0.08	3.6-5.5	<2	Low--------	0.17			
30---------------- Pottsburg	0-64	<5	1.20-1.70	6.0-20	0.03-0.10	3.6-6.5	<2	Low--------	0.10	5	2	<3
	64-80	1-6	1.30-1.70	0.6-2.0	0.10-0.25	3.6-6.0	<2	Low--------	0.15			
31---------------- Osier	0-8	5-10	1.25-1.60	6.0-20	0.03-0.10	3.6-6.0	<2	Low--------	0.10	5	---	---
	8-61	5-10	1.40-1.60	6.0-20	0.03-0.10	3.6-6.0	<2	Low--------	0.10			
	61-80	2-5	1.40-1.60	>20	0.02-0.05	3.6-6.0	<2	Low--------	0.05			
32---------------- Plummer	0-48	1-7	1.35-1.65	2.0-20.0	0.03-0.20	3.6-5.5	<2	Very low	0.10	5	2	1-3
	48-80	15-30	1.50-1.70	0.6-2.0	0.07-0.15	3.6-5.5	<2	Very low	0.15			
33---------------- Pelham	0-34	1-8	1.50-1.70	6.0-20	0.04-0.07	4.5-5.5	<2	Very low	0.10	5	2	1-2
	34-38	15-30	1.30-1.60	0.6-2.0	0.10-0.13	4.5-5.5	<2	Low--------	0.24			
	38-80	15-40	1.30-1.60	0.6-2.0	0.10-0.16	4.5-5.5	<2	Low--------	0.24			
36---------------- Alapaha	0-32	4-10	---	6.0-20	0.05-0.08	4.5-5.5	<2	Low--------	0.10	5	2	1-2
	32-80	15-30	---	0.2-0.6	0.10-0.13	4.5-5.5	<2	Low--------	0.24			
37---------------- Rains	0-13	2-10	1.40-1.70	6.0-20	0.07-0.10	4.5-6.5	<2	Low--------	0.15	5	2	1-6
	13-58	18-35	1.30-1.50	0.6-2.0	0.10-0.15	4.5-5.5	<2	Low--------	0.24			
	58-73	18-40	1.30-1.50	0.6-2.0	0.10-0.15	4.5-5.5	<2	Low--------	0.28			
	73-80	---	---	---	---	---	---	-----------	----			
38---------------- Pansey	0-18	3-15	---	2.0-6.0	0.06-0.10	4.5-5.5	<2	Low--------	0.17	5	---	.5-2
	18-62	20-35	---	0.6-2.0	0.12-0.16	4.5-5.5	<2	Low--------	0.28			
	62-80	20-40	---	0.06-0.2	0.12-0.17	4.5-5.5	<2	Low--------	0.28			
39---------------- Pantego	0-18	5-15	1.40-1.60	2.0-6.0	0.10-0.20	3.6-5.5	<2	Low--------	0.15	5	3	4-10
	18-32	18-35	1.30-1.40	0.6-2.0	0.12-0.20	3.6-5.5	<2	Low--------	0.28			
	32-80	18-40	1.25-1.40	0.6-2.0	0.15-0.20	3.6-5.5	<2	Low--------	0.28			
40---------------- Arents	0-80	1-5	1.30-1.70	>20	0.02-0.05	3.6-6.5	<2	Low--------	0.10	5	1	<1
41---------------- Dirego	0-28	---	0.10-0.33	6.0-20	0.01-0.03	6.1-7.3	>16	Low--------	0.10	2	2	40-50
	28-80	2-12	1.50-1.60	6.0-20	0.01-0.03	5.6-6.5	2-16	Low--------	0.17			
42---------------- Resota	0-80	<3	1.50-1.60	>20	0.02-0.05	4.5-6.5	<2	Low--------	0.10	5	1	<1
43*. Urban land												
44*. Beaches												

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	G/cm^3	In/hr	In/in	pH	Mmhos/cm					Pct
45---------------- Kureb	0-80	0-3	1.60-1.80	6.0-20	<0.05	4.5-7.3	<2	Low--------	0.10	5	1	<2
46---------------- Sapelo	0-20	2-5	---	6.0-20	0.03-0.07	3.6-5.5	<2	Low--------	0.10	5	2	1-3
	20-27	4-7	---	0.6-2.0	0.10-0.15	3.6-5.5	<2	Low--------	0.15			
	27-58	3-6	---	6.0-20	0.03-0.07	3.6-5.5	<2	Low--------	0.17			
	58-80	15-30	---	0.6-2.0	0.12-0.17	3.6-5.5	<2	Low--------	0.24			
47*. Pits												
48*:												
Fripp------------	0-3	<5	1.30-1.70	6.0-20	0.02-0.08	5.1-7.8	<2	Low--------	0.10	5	1	<1
	3-80	<5	1.30-1.70	6.0-20	0.01-0.03	5.6-7.8	<2	Low--------	0.10			
Corolla----------	0-80	0-3	1.60-1.70	>20	0.01-0.03	5.6-7.8	<2	Low--------	0.10	5	1	<.5
50---------------- Pickney	0-30	2-10	1.20-1.40	6.0-20	0.10-0.20	3.6-5.5	<2	Low--------	0.10	5	2	3-15
	30-80	1-10	1.40-1.60	6.0-20	0.03-0.11	4.5-6.0	<2	Low--------	0.10			
51*:												
Rutlege----------	0-22	<10	---	6.0-20	0.04-0.10	3.6-5.0	<2	Low--------	0.17	5	2	3-15
	22-80	<10	---	6.0-20	0.04-0.08	3.6-5.0	<2	Low--------	0.17			
Pamlico----------	0-30	---	0.40-0.65	0.6-6.0	0.24-0.26	3.6-4.4	<2	Low--------	0.10	2	2	20-80
	30-80	5-10	1.60-1.75	6.0-20	0.03-0.06	3.6-5.5	<2	Low--------	0.10			
52---------------- Bayvi	0-28	3-9	1.50-1.60	6.0-20	0.01-0.03	6.1-7.3	>4	Low--------	0.10	5	2	1-3
	28-80	3-9	1.50-1.60	6.0-20	0.01-0.03	6.1-7.3	4-16	Low--------	0.10			
53*:												
Ebro-------------	0-80	10-30	0.30-0.80	0.2-2.0	0.35-0.45	3.6-4.4	<2	-----------	0.10	2	2	20-80
Dorovan----------	0-60	---	0.35-0.55	0.6-2.0	0.25-0.50	3.6-4.4	<2	-----------	0.10	2	2	---
	60-80	5-20	1.40-1.65	6.0-20	0.05-0.08	4.5-5.5	<2	Low--------	0.10			

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--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 more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Map symbol and soil name	Hydro-logic group	Flooding			High water table			Subsidence		Risk of corrosion	
		Frequency	Dura-tion	Months	Depth*	Kind	Months	Initial	Total	Uncoated steel	Concrete
					Ft			In	In		
1, 2----------- Albany	C	None--------	---	---	1.0-2.5	Apparent	Dec-Mar	---	---	High-----	High.
3, 4----------- Blanton	A	None--------	---	---	5.0-6.0	Perched	Dec-Mar	---	---	High-----	High.
5, 6----------- Bonifay	A	None--------	---	---	4.0-5.0	Perched	Jan-Feb	---	---	Low------	High.
9, 10, 11------ Lakeland	A	None--------	---	---	>6.0	---	---	---	---	Low------	Moderate.
12------------- Leefield	C	None--------	---	---	1.5-2.5	Apparent	Dec-Mar	---	---	Moderate	High.
13------------- Leon	B/D	None--------	---	---	0-1.0	Apparent	Jun-Feb	---	---	High-----	High.
15, 16--------- Stilson	B	None--------	---	---	2.5-3.0	Perched	Dec-Apr	---	---	Moderate	High.
17, 18, 19----- Troup	A	None--------	---	---	>6.0	---	---	---	---	Low------	Moderate.
20, 21--------- Foxworth	A	None--------	---	---	3.5-6.0	Apparent	Jun-Oct	---	---	Low------	High.
22**:											
Pamlico--------	D	Frequent---	Very long.	Jan-Dec	+1-1.0	Apparent	Dec-May	4-12	10-25	High-----	High.
Dorovan--------	D	Frequent---	Very long.	Jan-Dec	+1-0.5	Apparent	Jan-Dec	4-12	51-80	High-----	High.
23, 24--------- Chipley	C	None--------	---	---	2.0-3.0	Apparent	Dec-Apr	---	---	Low------	High.
25------------- Hurricane	C	None--------	---	---	2.0-3.5	Apparent	Nov-Apr	---	---	Low------	Moderate.
26------------- Centenary	B	None--------	---	---	3.5-5.0	Apparent	Dec-Mar	---	---	Moderate	High.
27------------- Mandarin	B/D	None--------	---	---	1.5-3.5	Apparent	Jun-Dec	---	---	Moderate	High.
28------------- Allanton	B/D	Frequent---	Very long.	Dec-May	0-1.0	Apparent	Dec-May	---	---	High-----	High.
29------------- Rutlege	B/D	None--------	---	---	+2-1.0	Apparent	Dec-May	---	---	High-----	High.
30------------- Pottsburg	B/D	None--------	---	---	0-1.0	Apparent	Jul-Mar	---	---	High-----	High.
31------------- Osier	A/D	None--------	---	---	+1-1.0	Apparent	Nov-Mar	---	---	High-----	High.
32------------- Plummer	B/D	Rare--------	---	---	0-1.5	Apparent	Dec-Jul	---	---	Moderate	High.
33------------- Pelham	B/D	Frequent---	Brief	Dec-Mar	0.5-1.5	Apparent	Jan-Apr	---	---	High-----	High.

See footnotes at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Map symbol and soil name	Hydro-logic group	Flooding			High water table			Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth*	Kind	Months	Initial	Total	Uncoated steel	Concrete
					Ft			In	In		
36: Alapaha	D	Occasional	Brief	Jan-Apr	0.5-1.5	Apparent	Dec-May	---	---	High	High.
37: Rains	B/D	None	---	---	0-1.0	Apparent	Nov-Apr	---	---	High	High.
38: Pansey	D	Occasional	Brief	Dec-Mar	0-1.5	Apparent	Dec-Mar	---	---	High	Moderate.
39: Pantego	B/D	Rare	---	---	0-1.5	Apparent	Dec-May	---	---	High	High.
40: Arents	A	None	---	---	>6.0	---	---	---	---	Low	High.
41: Dirego	D	Frequent	Very long.	Jan-Dec	0-1.0	Apparent	Jan-Dec	16-20	16-40	High	High.
42: Resota	A	None	---	---	3.5-5.0	Apparent	Dec-Apr	---	---	Low	High.
43**. Urban land											
44**. Beaches											
45: Kureb	A	None	---	---	>6.0	---	---	---	---	Low	Low.
46: Sapelo	B/D	None	---	---	0.5-1.5	Apparent	Nov-Apr	---	---	High	High.
47**. Pits											
48**:											
Fripp	A	Rare	---	---	>6.0	---	---	---	---	Low	Low.
Corolla	D	Rare	---	---	1.5-3.0	Apparent	Nov-May	---	---	Low	Low.
50: Pickney	A/D	Occasional	Very long.	Dec-Mar	+1-1.0	Apparent	Nov-Apr	---	---	High	High.
51**:											
Rutlege	B/D	Frequent	Long	Jan-Dec	0-1.0	Apparent	Dec-May	---	---	High	High.
Pamlico	D	Frequent	Long	Jan-Dec	0-1.0	Apparent	Dec-May	4-12	10-25	High	High.
52: Bayvi	D	Frequent	Very long.	Jan-Dec	0-1.0	Apparent	Jan-Dec	---	---	High	High.
53**:											
Ebro	D	Frequent	Very long.	Jan-Dec	0-0.5	Apparent	Jan-Dec	3-6	16-30	High	High.
Dorovan	D	Frequent	Very long.	Jan-Dec	+1-0.5	Apparent	Jan-Dec	4-12	51-80	High	High.

* A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water is above the surface. The second numeral indicates the depth below the surface.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--PHYSICAL PROPERTIES OF SELECTED SOILS

Soil name and sample number	Depth	Horizon	Particle-size distribution (Percent less than 2 mm)								Hydraulic conductivity	Bulk density (field moist)	Water content		
			Sand						Silt	Clay					
			Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.10)	Very fine (0.10-0.05)	Total (2.0-0.05)	(0.05-0.002)	(<0.002)			1/10 bar	1/3 bar	15 bar
	Cm										Cm/hr	G/cm3	-----Pct (wt)-----		
Albany sand:[1] (S80FL-005-013)	0-18	A1	0.3	5.9	19.1	47.0	17.9	90.2	7.1	2.7	12.2	1.32	16.3	9.5	2.7
	18-48	A21	0.5	5.4	17.1	47.5	19.4	89.9	7.4	2.7	10.1	1.55	13.5	9.1	1.8
	48-109	A22	0.8	6.4	17.0	46.4	19.6	90.2	6.8	3.0	2.2	1.60	11.5	6.3	1.7
	109-137	B1	0.6	5.2	16.6	41.8	16.2	80.4	5.9	13.7	3.4	1.72	14.2	12.4	5.4
	137-203	B2t	0.6	6.2	18.0	40.2	14.2	79.2	5.1	15.7	7.9	1.73	16.2	14.1	6.8
Allanton sand:[2] (S80FL-005-014)	0-25	A11	0.1	8.5	49.0	32.2	1.7	91.5	6.5	2.0	---	---	---	---	---
	25-46	A12	0.1	7.5	46.9	34.0	2.5	91.0	7.2	1.8	---	---	---	---	---
	46-68	A21	0.1	8.1	49.4	33.7	1.8	93.1	5.1	1.8	---	---	---	---	---
	68-81	A22	0.0	8.6	46.2	31.0	1.4	89.2	8.4	2.4	---	---	---	---	---
	81-102	A23	0.0	8.8	49.8	32.4	1.8	92.8	5.2	2.0	---	---	---	---	---
	102-130	A24	0.1	9.6	51.8	32.4	1.9	95.8	2.8	1.4	---	---	---	---	---
	130-142	B1h	0.1	8.9	50.9	29.7	1.8	91.4	6.0	2.6	---	---	---	---	---
	142-203	B2h	0.1	9.4	53.5	34.2	1.3	98.5	1.0	0.5	---	---	---	---	---
Bayvi loamy sand:[2] (S80-FL-005-008)	0-20	A11	1.4	18.6	33.4	23.8	6.2	83.4	11.7	4.9	---	---	---	---	---
	20-71	A12	2.8	20.4	40.0	20.6	7.0	90.8	6.0	3.2	---	---	---	---	---
	71-122	C1	1.0	17.0	36.0	27.0	10.8	82.8	13.4	3.8	---	---	---	---	---
	122-165	C2	2.0	16.0	32.8	29.0	0.6	80.4	11.3	8.3	---	---	---	---	---
	165-203	C3	2.0	17.8	34.2	30.0	5.2	89.2	5.1	5.7	---	---	---	---	---
Blanton fine sand:[2] (S81FL-005-017)	0-10	A1	0.1	3.7	20.2	63.4	3.0	90.4	7.2	2.4	16.8	1.40	10.7	6.5	2.0
	10-20	A21	0.1	3.4	19.1	64.1	3.7	90.4	7.4	2.2	23.3	1.43	9.2	5.3	1.6
	20-51	A21	0.1	3.2	20.9	63.2	3.6	91.0	6.0	3.0	23.3	1.48	8.1	5.2	1.5
	51-81	A22	0.1	3.3	18.9	64.5	3.7	90.5	7.1	2.4	18.7	1.55	6.1	3.5	1.1
	81-119	A22	0.2	4.0	18.6	62.8	4.0	89.6	6.4	4.0	13.1	1.56	7.1	4.8	1.6
	119-152	A23	0.2	3.8	19.6	61.6	3.4	88.6	6.4	5.0	18.7	1.58	6.6	4.5	1.6
	152-160	B21t	0.2	3.6	16.6	56.0	3.4	79.8	6.8	13.4	1.3	1.66	13.5	11.6	5.8
	160-203	B22t	0.2	2.8	16.8	53.8	2.0	75.6	4.6	19.8	0.5	1.65	17.6	15.9	8.2
Centenary sand:[2] (S79FL-005-002)	0-23	Ap	0.0	9.3	52.3	26.8	3.2	91.6	6.1	2.3	104.5	1.39	5.8	4.1	1.4
	23-79	A21	0.1	11.0	52.6	26.5	2.5	92.7	5.8	1.5	63.1	1.44	5.9	4.2	0.9
	79-124	A22	0.1	11.1	53.8	26.5	2.4	93.9	6.3	1.0	70.3	1.53	4.3	2.8	0.7
	124-185	A23	0.1	9.9	51.9	31.5	2.5	95.9	3.5	0.6	54.5	1.61	3.6	2.2	0.4
	185-196	B1h	0.1	11.5	48.3	23.0	1.4	84.3	12.1	3.6	9.8	1.75	8.8	7.2	2.7
	196-203	B2h	0.0	13.0	58.5	23.3	2.1	96.9	2.1	1.0	27.6	1.63	8.8	6.0	2.2

See footnotes at end of table.

TABLE 17.--PHYSICAL PROPERTIES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Particle-size distribution (Percent less than 2 mm): Sand: Very coarse (2.0-1.0)	Sand: Coarse (1.0-0.5)	Sand: Medium (0.5-0.25)	Sand: Fine (0.25-0.10)	Sand: Very fine (0.10-0.05)	Sand: Total (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Hydraulic conductivity	Bulk density (field moist)	Water content: 1/10 bar	Water content: 1/3 bar	Water content: 15 bar
	Cm										Cm/hr	G/cm^3	-----Pct (wt)----		
Chipley fine sand:[3]															
(S81FL-005-018)	0-10	A1	0.2	5.1	16.8	68.0	2.2	92.3	6.2	1.5	30.5	1.38	9.3	5.9	1.6
	10-68	C1	0.3	5.0	16.7	67.1	2.8	91.9	6.5	1.6	17.4	1.57	6.0	3.6	0.8
	68-96	C2	0.2	4.2	16.1	69.2	2.6	92.3	6.3	1.4	13.8	1.55	6.3	3.8	0.6
	96-155	C3	0.3	4.3	15.1	72.0	3.0	94.7	4.3	1.0	20.3	1.54	5.7	3.2	0.4
	155-203	C4	0.4	4.6	15.0	74.4	2.2	96.6	2.9	0.5	26.9	1.56	4.9	2.6	0.4
Dirego muck:[2]															
(S79FL-005-007)	0-71	Oa	---	---	---	---	---	---	---	---	---	---	---	---	---
	71-91	IIC1	0.9	10.3	16.5	37.2	9.0	73.9	14.0	12.1	---	---	---	---	---
	91-102	IIC2	0.6	3.4	7.0	64.6	5.8	81.4	14.0	4.6	---	---	---	---	---
	102-117	IIC3	0.4	4.4	15.2	64.0	10.2	94.2	4.0	1.8	---	---	---	---	---
	117-203	IIC4	1.6	14.4	27.8	43.2	7.8	94.8	3.4	1.8	---	---	---	---	---
Foxworth fine sand:[4]															
(S81FL-005-016)	0-10	A1	0.0	3.6	25.5	62.3	2.4	93.8	4.9	1.3	20.7	1.45	8.0	4.5	1.3
	10-20	A&C	0.2	3.7	23.8	62.4	2.9	93.0	5.4	1.6	20.7	1.53	6.4	3.9	1.0
	20-96	C1	0.2	3.0	20.9	65.3	3.7	93.1	5.5	1.4	22.7	1.51	6.0	3.3	1.0
	96-155	C2	0.2	4.2	21.9	64.3	3.6	94.2	4.7	1.1	14.7	1.64	5.4	2.9	0.7
	155-203	C3	0.4	5.3	22.8	64.7	2.2	95.4	3.0	1.6	20.4	1.49	4.8	2.8	0.6
Hurricane sand:[2]															
(S79FL-005-001)	0-15	A1	0.1	11.8	50.6	28.0	2.4	92.9	5.1	2.0	78.3	1.41	6.8	4.7	1.8
	15-25	A21	0.2	11.9	51.4	26.2	2.4	92.1	6.7	1.2	65.7	1.41	8.6	6.1	1.9
	25-56	A22	0.2	10.5	46.2	31.7	3.3	91.9	6.5	1.5	32.6	1.54	6.9	5.0	1.4
	56-86	A23	0.3	9.9	46.8	33.3	3.0	93.3	5.4	1.3	25.5	1.56	6.6	4.3	1.2
	86-130	A24	0.2	11.3	47.7	32.9	3.2	95.3	4.0	0.7	22.5	1.62	6.7	4.9	0.8
	130-140	B1h	0.4	17.7	47.8	20.4	1.0	87.3	5.5	7.2	8.3	1.59	16.3	14.6	3.9
	140-203	B2h	0.3	19.3	54.1	18.3	1.3	93.3	5.0	1.7	13.7	1.58	12.7	10.3	2.5
Kureb sand:[2]															
(S79FL-005-005)	0-15	A1	0.0	0.8	45.8	49.2	0.8	96.6	2.6	0.8	46.6	1.47	5.0	3.3	1.6
	15-36	A2	0.0	1.0	51.1	45.4	0.6	98.1	1.3	0.6	65.7	1.53	3.4	2.6	0.6
	36-64	C&Bh	0.0	0.9	42.7	51.0	0.5	95.1	2.7	2.2	75.6	1.50	4.5	3.1	1.3
	64-127	C1	0.0	0.8	48.7	46.0	0.7	96.2	2.0	1.8	48.6	1.60	3.2	2.0	0.6
	127-190	C12	0.0	0.9	41.6	53.9	0.7	97.1	1.6	1.3	74.9	1.54	3.1	2.1	0.5
	190-203	C3	0.0	1.5	48.5	47.7	0.8	98.5	0.7	1.8	118.8	1.49	2.1	1.1	0.8
Lakeland sand:[5]															
(S81FL-005-019)	0-13	A1	0.2	8.9	56.0	29.5	0.6	95.2	1.3	2.1	62.4	1.45	7.0	4.7	1.2
	13-25	AC	0.1	8.7	55.4	29.4	1.1	94.7	3.4	1.9	59.1	1.46	5.5	3.3	0.8
	25-96	C1	0.1	8.2	57.1	28.7	1.0	95.1	2.7	2.2	55.2	1.58	4.1	2.8	0.8
	96-162	C2	0.2	9.4	57.6	28.7	0.7	96.6	1.9	1.5	70.3	1.51	3.5	2.3	0.6
	162-203	C3	0.1	8.7	59.1	29.4	0.5	97.8	1.2	1.0	65.7	1.56	2.5	1.5	0.3

See footnotes at end of table.

TABLE 17.--PHYSICAL PROPERTIES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Particle-size distribution (Percent less than 2 mm): Sand: Very coarse (2.0-1.0)	Sand: Coarse (1.0-0.5)	Sand: Medium (0.5-0.25)	Sand: Fine (0.25-0.10)	Sand: Very fine (0.10-0.05)	Sand: Total (2.0-0.05)	Silt (0.05-0.002)	Clay (<0.002)	Hydraulic conductivity	Bulk density (field moist)	Water content: 1/10 bar	Water content: 1/3 bar	Water content: 15 bar
	Cm										Cm/hr	G/cm3	Pct (wt)	Pct (wt)	Pct (wt)
Leon sand:[6]															
(S79FL-005-003)	0-15	A1	0.0	10.1	55.4	24.4	2.8	92.7	6.1	1.2	24.9	1.53	7.8	4.9	1.3
	15-46	A2	0.0	10.1	58.4	24.1	2.0	94.6	4.8	0.6	36.8	1.53	4.4	2.9	0.5
	46-58	B2h	0.1	8.5	51.5	28.3	3.1	91.5	5.8	2.7	10.1	1.56	12.1	9.1	2.4
	58-135	A'2	0.0	8.9	54.5	27.5	3.3	94.2	4.5	1.3	---	---	---	---	---
	135-203	B'h	0.1	11.2	53.5	26.5	2.3	93.6	5.2	1.2	---	---	---	---	---
Mandarin sand:[2]															
(S79FL-005-006)	0-18	A1	0.0	1.4	53.7	41.8	0.7	97.6	1.8	0.6	56.5	1.49	3.7	3.0	1.7
	18-64	A2	0.0	1.7	55.3	39.4	0.9	97.3	2.4	0.3	88.7	1.47	3.0	2.1	0.4
	64-91	B21h	0.0	1.7	46.6	43.6	0.8	92.7	4.2	3.1	53.9	1.53	5.0	3.4	0.8
	91-145	B22h	0.0	1.4	52.1	39.8	0.8	94.1	3.6	2.3	---	---	---	---	---
Osier fine sand:[2]															
(S80FL-005-009)	0-23	Ap	0.0	2.1	35.5	56.3	0.5	94.4	3.4	2.2	9.1	1.26	22.3	15.0	2.9
	23-86	A&C	0.0	2.1	33.1	56.5	0.7	92.4	4.4	3.2	4.5	1.45	15.7	11.4	1.9
	86-112	C1	0.0	2.8	38.6	51.7	0.5	93.6	2.2	4.2	3.3	1.60	12.4	9.1	1.9
	112-155	C2	0.0	2.7	38.0	54.3	0.5	95.5	0.3	4.2	7.0	1.58	18.1	12.0	1.5
	155-175	C3	0.0	2.8	38.6	54.1	0.5	96.0	0.5	3.5	3.0	1.52	12.2	7.9	1.2
	175-203	C4	0.0	2.6	38.7	54.8	0.5	96.6	0.5	2.9	6.6	1.47	11.9	8.1	1.5
Pottsburg fine sand:[7]															
(S80FL-005-010)	0-20	Ap	0.0	1.9	33.2	59.7	0.9	95.7	3.2	1.1	28.7	1.21	15.0	11.7	1.4
	20-38	A21	0.0	1.7	33.4	59.9	1.0	96.0	3.1	0.9	15.1	1.42	12.8	8.9	1.3
	38-89	A22	0.0	1.6	34.9	58.7	1.1	96.3	2.5	1.2	12.2	1.46	11.3	8.0	1.1
	89-107	A23	0.0	2.0	36.8	54.2	0.8	93.8	3.4	2.8	---	---	---	---	---
	107-130	A24	0.0	1.7	38.4	53.4	0.6	94.1	1.2	4.7	2.7	1.48	21.1	17.2	1.8
	130-162	B21h	0.0	2.2	42.9	51.4	0.4	96.9	1.1	2.0	1.0	1.53	19.1	13.9	2.4
	162-193	B22h	0.0	2.1	40.6	52.8	0.4	95.9	2.1	2.0	1.5	1.57	20.0	14.5	1.8
	193-208	B3	0.0	2.1	35.7	59.3	0.6	97.7	0.3	2.0	---	---	---	---	---
Resota fine sand:[2]															
(S79FL-005-004)	0-10	A1	0.0	1.4	44.7	50.5	0.7	97.3	1.8	0.9	59.1	1.51	3.3	2.2	0.9
	10-48	A2	0.0	1.5	50.7	44.6	0.9	97.7	2.0	0.3	59.8	1.53	3.6	2.7	0.6
	48-68	B21	0.0	1.4	41.5	50.6	0.8	94.3	3.4	2.3	63.8	1.52	5.2	3.6	1.2
	68-107	B22	0.0	1.3	47.9	45.5	0.8	95.5	2.7	1.8	100.8	1.39	4.7	3.6	0.8
	107-130	C1	0.0	1.6	43.8	50.6	0.8	96.8	2.2	1.0	59.8	1.55	3.8	2.6	0.6
	130-203	C2	0.0	1.9	44.9	50.8	1.1	98.7	0.5	0.8	---	---	---	---	---

See footnotes at end of table.

TABLE 17.--PHYSICAL PROPERTIES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Particle-size distribution (Percent less than 2 mm)								Hydraulic conductivity	Bulk density (field moist)	Water content		
			Sand						Silt	Clay					
			Very coarse (2.0-1.0)	Coarse (1.0-0.5)	Medium (0.5-0.25)	Fine (0.25-0.10)	Very fine (0.10-0.05)	Total (2.0-0.05)	(0.05-0.002)	(<0.002)			1/10 bar	1/3 bar	15 bar
	Cm										Cm/hr	G/cm[3]	-----Pct (wt)----		
Stilson sand:[8]															
(S80FL-005-015)	0-15	A1	0.4	6.5	21.2	39.7	19.3	87.1	9.6	3.3	5.5	1.40	17.7	9.2	2.0
	15-36	A21	0.5	6.1	20.0	39.2	20.3	86.1	10.7	3.2	2.5	1.49	14.7	8.6	1.8
	36-81	A22	0.6	5.7	18.3	39.6	20.4	84.6	10.6	4.8	2.7	1.56	12.9	6.3	2.2
	81-91	A23	0.7	6.6	18.6	39.3	19.2	84.4	10.1	5.5	1.2	1.71	9.8	6.6	2.8
	91-112	B1t	0.9	6.1	18.5	38.4	17.5	81.4	8.7	9.9	1.7	1.71	10.9	8.7	3.3
	112-132	B21t	1.1	7.0	18.7	33.9	13.2	73.9	7.7	18.4	1.9	1.68	12.7	10.4	6.0
	132-152	B22t	1.0	6.6	19.0	29.8	10.0	66.4	8.1	25.5	0.7	1.69	18.0	16.3	10.7
	152-203	B23t	1.2	8.2	19.8	26.8	4.6	60.6	6.1	33.3	4.6	1.52	22.1	20.2	14.8
Troup coarse sand:[9]															
(S81FL-005-020)	0-10	A1	5.5	28.0	42.4	16.0	1.0	92.9	4.8	2.3	59.1	1.52	7.0	4.8	1.1
	10-36	A21	4.6	26.0	44.0	17.0	1.0	92.6	4.8	2.6	62.4	1.55	5.7	3.7	1.1
	36-96	A22	11.4	32.2	38.8	10.8	0.6	93.8	3.8	2.4	53.3	1.68	4.3	3.0	1.0
	96-142	A23	17.6	31.0	36.0	11.6	0.6	96.8	1.8	1.4	38.8	1.67	3.3	2.0	0.6
	142-152	A24	19.6	33.6	30.4	7.8	0.6	92.0	2.0	6.0	19.7	1.68	7.9	6.0	3.2
	152-203	B2t	12.4	27.2	32.6	11.2	0.8	84.2	1.6	14.2	6.2	1.67	11.4	9.4	5.2

1 Albany sand:
About 1 mile east of U.S. Highway 231 and 3/4 mile south of John Pitts Road, about 70 feet north of dirt road, NW1/4SW1/4 sec. 10, T. 3 S., R. 13 W.

2 Typical pedon for the series.

3 Chipley fine sand:
About 1/2 mile east of U.S. Highway 231, 2,000 feet south of Linger Longer dirt road, NW1/4SE1/4 sec. 15, T. 1 S., R. 12 W.

4 Foxworth fine sand:
About 1/2 mile east of U.S. Highway 231, 2 miles northeast of Youngstown, south of Linger Longer dirt road, SE1/4NE1/4 sec. 15, T. 1 S., R. 12 W.

5 Lakeland sand:
About 1 1/2 miles west of U.S. Highway 231, 1 1/2 miles south of Bay and Jackson County line, NW1/4SW1/4 sec. 26, T. 2 N., R. 12 W.

6 Leon sand:
About 1 1/5 miles east of U.S. Highway 231, 3/5 mile east of Atlantic and St. Andrews Bay Line Railroad, NE1/4SW1/4 sec. 1, T. 1 N., R. 12 W.

7 Pottsburg fine sand:
About 3/4 mile west of Farmdale Bayou, 1 mile north of U.S. Highway 91 on Tyndall Air Force Base, NW1/4SW1/4 sec. 31, T. 5 S., R. 12 W.

8 Stilson sand:
About 1 1/5 miles west of Gulf County line, 18 miles east of Panama City, 50 feet off right side of dirt road, NE1/4SE1/4 sec. 26, T. 3 S., R. 12 W.

9 Troup coarse sand:
About 1 3/4 miles west of U.S. Highway 231, 1/8 mile north of Sweetwater Creek on west side of dirt road, NE1/4SW1/4 sec. 34, T. 2 N., R. 12 W. Taxadjunct to the Troup series because the particle-size family class is sandy (but only by 0.1 percent clay), and the sand-size fraction is coarser than allowed for the series.

TABLE 18.--CHEMICAL PROPERTIES OF SELECTED SOILS

Soil name and sample number	Depth	Horizon	Extractable bases: Ca	Mg	Na	K	Sum	Extractable acidity	Sum cations	Base saturation	Organic carbon	Electrical conductivity	pH: H_2O	$CaCl_2$	KCl	Pyrophosphate extractable: C	Fe	Al	Citrate dithionite extractable: Fe	Al
	Cm		----Milliequivalents/100 grams of soil----							Pct	Pct	Mmho /cm				Pct	Pct	Pct	Pct	Pct
Albany sand:[1] (S80FL-005-013)	0-18	A1	0.03	0.02	0.08	0.02	0.15	4.59	4.74	3	0.45	0.08	4.7	4.3	4.2	---	---	---	---	---
	18-48	A21	0.02	0.01	0.01	0.00	0.04	0.52	0.56	7	0.03	0.03	4.6	4.5	4.7	---	---	---	---	---
	48-109	A22	0.06	0.02	0.02	0.00	0.10	0.26	0.36	28	0.00	0.03	4.8	4.6	4.6	---	---	---	---	---
	109-137	B1	0.08	0.13	0.04	0.01	0.26	2.43	2.69	10	0.00	0.03	4.7	4.7	4.4	---	---	---	---	---
	137-203	B2t	0.05	0.13	0.04	0.01	0.23	2.76	2.99	8	0.00	0.03	4.7	4.7	4.3	---	---	---	0.04	0.04
Allanton sand:[2] (S80FL-005-014)	0-25	A11	0.03	0.02	0.02	0.02	0.09	6.43	6.52	1	1.20	0.08	4.6	4.3	4.1	---	---	---	---	---
	25-46	A12	0.02	0.02	0.01	0.01	0.06	5.32	5.38	1	0.94	0.04	4.5	4.4	4.5	---	---	---	---	---
	46-68	A21	0.01	0.01	0.01	0.00	0.03	2.10	2.13	1	0.19	0.02	4.8	4.6	4.6	---	---	---	---	---
	68-81	A22	0.03	0.01	0.02	0.00	0.06	1.51	1.57	4	0.04	0.03	4.9	4.8	4.7	---	---	---	---	---
	81-102	A23	0.03	0.01	0.02	0.00	0.06	1.31	1.37	4	0.02	0.02	4.8	4.8	4.8	---	---	---	---	---
	102-130	A24	0.02	0.01	0.00	0.00	0.03	0.79	0.82	4	0.00	0.02	4.8	4.8	4.8	---	---	---	---	---
	130-142	B1h	0.03	0.01	0.01	0.00	0.05	2.75	2.80	2	0.19	0.02	4.8	4.8	4.7	---	---	---	---	---
	142-203	B2h	0.07	0.05	0.07	0.02	0.22	12.32	12.54	2	1.42	0.02	4.4	4.4	4.4	1.44	0.01	1.05	0.05	0.13
Bayvi loamy sand:[2 3] (S80FL-005-008)	0-20	A11	2.95	0.30	18.46	0.68	22.39	6.47	28.86	78	1.24	17.50	5.0	4.8	4.7	---	---	---	---	---
	20-71	A12	1.72	1.89	13.24	0.42	17.27	4.36	21.63	80	0.69	4.55	4.7	4.5	4.5	---	---	---	---	---
	71-122	C1	1.60	1.66	11.56	0.01	14.83	10.69	25.52	58	0.67	13.50	3.2	3.2	3.1	---	---	---	---	---
	122-165	C2	1.27	1.54	10.80	0.53	14.14	7.13	21.27	66	0.40	3.10	4.3	4.1	3.8	---	---	---	0.06	0.02
	165-203	C3	0.97	1.21	10.00	0.32	12.50	6.44	18.94	66	0.21	3.80	4.2	4.1	3.8	---	---	---	---	---
Blanton fine sand:[2] (S81FL-005-017)	0-10	A1	0.10	0.07	0.03	0.03	0.23	4.47	4.70	5	1.27	0.02	5.5	4.3	4.0	---	---	---	---	---
	10-20	A21	0.13	0.04	0.02	0.01	0.20	3.79	3.99	5	0.84	0.02	5.5	4.5	4.2	---	---	---	---	---
	20-51	A21	0.06	0.03	0.02	0.01	0.12	2.22	2.34	5	0.34	0.01	5.6	4.6	4.4	---	---	---	---	---
	51-81	A22	0.11	0.06	0.01	0.01	0.19	1.10	1.29	15	0.13	0.01	5.6	4.8	4.5	---	---	---	---	---
	81-119	A22	0.13	0.07	0.01	0.01	0.22	0.82	1.04	21	0.12	0.01	5.5	4.6	4.4	---	---	---	---	---
	119-152	A23	0.17	0.20	0.01	0.01	0.39	1.57	1.96	20	0.09	0.01	5.5	4.5	4.4	---	---	---	---	---
	152-160	B21t	0.21	0.34	0.02	0.02	0.77	3.53	4.30	18	0.21	0.01	5.3	4.3	4.3	---	---	---	0.34	0.12
	160-203	B22t	0.06	0.31	0.03	0.01	0.40	6.30	6.70	6	0.27	0.01	4.5	4.2	4.1	---	---	---	0.62	0.18
Centenary sand:[2] (S79FL-005-002)	0-23	Ap	0.20	0.03	0.02	0.01	0.26	2.53	2.79	9	0.40	0.02	5.3	4.7	4.2	---	---	---	---	---
	23-79	A21	0.12	0.02	0.01	0.00	0.15	1.13	1.28	12	0.15	0.02	5.6	5.2	4.8	---	---	---	---	---
	79-124	A22	0.06	0.02	0.02	0.01	0.11	3.13	3.24	3	0.07	0.02	5.8	5.2	4.9	---	---	---	---	---
	124-185	A23	0.03	0.01	0.00	0.00	0.04	1.72	1.76	2	0.05	0.01	6.0	5.4	5.1	---	---	---	---	---
	185-196	B1h	0.02	0.01	0.02	0.00	0.05	4.60	4.65	1	0.04	0.02	5.1	4.7	4.7	0.15	0.02	0.05	0.06	0.04
	196-203	B2h	0.01	0.01	0.01	0.00	0.03	5.47	5.50	1	0.37	0.02	4.9	4.7	4.6	0.24	0.02	0.08	0.08	0.08

See footnotes at end of table.

TABLE 18.--CHEMICAL PROPERTIES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Extractable bases: Ca	Mg	Na	K	Sum	Extractable acidity	Sum cations	Base saturation	Organic carbon	Electrical conductivity	pH: H_2O	$CaCl_2$	KCl	Pyrophosphate extractable: C	Fe	Al	Citrate dithionite extractable: Fe	Al
	Cm		----Milliequivalents/100 grams of soil----							Pct	Pct	Mmho /cm				Pct	Pct	Pct	Pct	Pct
Chipley fine sand:[4]																				
(S81FL-005-018)	0-10	A1	0.10	0.02	0.01	0.01	0.14	3.37	3.51	4	0.79	0.02	5.6	4.2	4.0	---	---	---	---	---
	10-68	C1	0.03	0.01	0.01	0.01	0.06	1.06	1.12	5	0.17	0.01	5.5	4.6	4.0	---	---	---	---	---
	68-96	C2	0.04	0.01	0.01	0.01	0.07	0.91	0.98	7	0.12	0.01	6.3	4.7	4.5	---	---	---	---	---
	96-155	C3	0.02	0.01	0.01	0.01	0.05	0.56	0.61	8	0.11	0.01	6.2	4.8	4.6	---	---	---	---	---
	155-203	C4	0.03	0.01	0.01	0.00	0.05	0.60	0.65	8	0.11	0.01	6.0	4.8	4.6	---	---	---	---	---
Dirego muck:[2 3]																				
(S79FL-005-007)	0-71	Oa	11.74	8.30	122.54	3.16	145.74	74.95	220.69	66	27.56	112.50	3.3	3.2	3.2	---	---	---	---	---
	71-91	IIC1	5.99	1.92	28.49	0.64	37.04	28.02	65.06	57	5.42	29.00	3.0	3.9	2.8	---	---	---	---	---
	91-102	IIC2	2.60	1.41	13.83	0.44	18.28	8.51	26.79	68	2.10	13.00	3.6	3.7	3.4	---	---	---	---	---
	102-117	IIC3	1.02	1.15	7.08	0.16	9.41	6.14	15.55	61	0.61	11.50	3.5	3.6	3.3	---	---	---	---	---
	117-203	IIC4	0.95	0.96	5.45	0.06	7.42	7.33	14.75	50	0.52	2.65	3.4	3.4	3.2	---	---	---	---	---
Foxworth fine sand:[5]																				
(S81FL-005-016)	0-10	A1	0.08	0.03	0.01	0.01	0.14	2.50	2.64	5	0.43	0.02	6.0	4.1	3.9	---	---	---	---	---
	10-20	A&C	0.04	0.02	0.01	0.01	0.08	1.69	1.77	5	0.25	0.01	6.1	4.6	4.5	---	---	---	---	---
	20-96	C1	0.05	0.02	0.01	0.00	0.08	0.85	0.93	9	0.13	0.01	5.7	4.7	4.5	---	---	---	---	---
	96-155	C2	0.03	0.01	0.01	0.00	0.05	0.50	0.55	9	0.09	0.01	5.1	4.7	4.6	---	---	---	---	---
	155-203	C3	0.04	0.01	0.01	0.00	0.06	0.64	0.70	9	0.09	0.01	4.5	4.7	4.6	---	---	---	---	---
Hurricane sand:[2]																				
(S79FL-005-001)	0-15	A1	0.17	0.05	0.04	0.02	0.28	4.60	4.88	6	0.79	0.03	5.7	4.2	3.6	---	---	---	---	---
	15-25	A21	0.07	0.03	0.02	0.01	0.13	3.20	3.33	4	0.59	0.03	5.1	4.5	4.1	---	---	---	---	---
	25-56	A22	0.02	0.02	0.02	0.01	0.07	1.53	1.60	4	0.25	0.02	5.2	4.8	4.7	---	---	---	---	---
	56-86	A23	0.02	0.01	0.01	0.01	0.05	1.13	1.18	4	0.13	0.01	5.3	4.9	4.8	---	---	---	---	---
	86-130	A24	0.02	0.01	0.03	0.00	0.06	0.40	0.46	13	0.06	0.04	6.0	5.1	4.9	---	---	---	---	---
	130-140	B1h	0.01	0.01	0.01	0.01	0.04	7.86	7.90	1	0.63	0.02	4.9	4.6	4.5	0.33	0.04	0.23	0.07	0.24
	140-203	B2h	0.01	0.01	0.00	0.00	0.02	6.53	6.55	---	0.82	0.01	5.1	4.8	4.7	0.48	0.01	0.19	0.05	0.26
Kureb sand:[2]																				
(S79FL-005-005)	0-15	A1	0.11	0.04	0.02	0.01	0.18	3.00	3.18	6	0.62	0.03	4.7	3.7	3.5	---	---	---	---	---
	15-36	A2	0.02	0.02	0.01	0.00	0.05	0.67	0.72	7	0.08	0.01	5.2	4.4	4.2	---	---	---	---	---
	36-64	C&Bh	0.02	0.02	0.01	0.01	0.06	2.93	2.99	2	0.27	0.03	4.9	4.5	4.4	0.15	0.09	0.07	0.20	0.07
	64-127	C1	0.01	0.02	0.02	0.00	0.05	1.27	1.32	4	0.07	0.02	5.0	4.6	4.7	---	---	---	---	---
	127-190	C2	0.01	0.02	0.02	0.00	0.05	0.67	0.72	7	0.05	0.13	5.0	4.7	4.7	---	---	---	---	---
	190-203	C3	0.01	0.01	0.00	0.00	0.02	0.87	0.89	2	0.04	0.01	5.1	4.8	5.0	---	---	---	---	---
Lakeland sand:[6]																				
(S81FL-005-019)	0-13	A1	0.13	0.03	0.01	0.01	0.18	4.36	4.54	4	0.55	0.02	5.8	4.1	3.8	---	---	---	---	---
	13-25	AC	0.02	0.01	0.01	0.01	0.05	0.89	0.94	5	0.33	0.01	5.8	4.5	4.3	---	---	---	---	---
	25-96	C1	0.04	0.03	0.01	0.01	0.09	1.09	1.18	8	0.07	0.01	5.6	4.5	4.4	---	---	---	---	---
	96-162	C2	0.02	0.01	0.01	0.00	0.04	0.75	0.79	5	0.05	0.01	5.5	5.2	4.6	---	---	---	---	---
	162-203	C3	0.04	0.02	0.01	0.00	0.07	0.53	0.60	12	0.02	0.01	5.5	5.6	4.7	---	---	---	---	---

See footnotes at end of table.

TABLE 18.--CHEMICAL PROPERTIES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Extractable bases					Extractable acidity	Sum cations	Base saturation	Organic carbon	Electrical conductivity	pH			Pyrophosphate extractable			Citrate dithionite extractable	
			Ca	Mg	Na	K	Sum						H_2O	$CaCl_2$	KCl	C	Fe	Al	Fe	Al
	Cm		----Milliequivalents/100 grams of soil----							Pct	Pct	Mmho /cm				Pct	Pct	Pct	Pct	Pct
Leon sand:[7] (S79FL-005-003)	0-15	A1	0.01	0.02	0.03	0.01	0.07	6.40	6.47	1	0.70	0.30	4.6	3.6	3.3	---	---	---	---	---
	15-46	A2	0.01	0.01	0.01	0.00	0.03	3.13	3.16	1	0.15	0.01	5.2	4.5	4.3	---	---	---	---	---
	46-58	B2h	0.01	0.01	0.01	0.00	0.03	7.80	7.83	---	0.72	0.02	4.7	4.4	4.3	0.53	0.00	0.10	0.04	0.08
	58-135	A'2	0.01	0.01	0.00	0.00	0.02	2.87	2.89	1	0.08	0.01	5.1	4.8	4.8	---	---	---	---	---
	135-203	B'h	0.02	0.02	0.00	0.00	0.04	6.20	6.24	1	0.58	0.01	5.0	4.8	4.6	0.31	0.00	0.09	0.05	0.09
Mandarin sand:[2] (S79FL-005-006)	0-18	A1	0.14	0.04	0.01	0.01	0.20	1.80	2.00	10	0.42	0.02	4.9	4.0	3.7	---	---	---	---	---
	18-64	A2	0.02	0.02	0.01	0.00	0.05	0.05	0.10	50	0.06	0.09	5.6	4.7	4.5	---	---	---	---	---
	64-91	B21h	0.03	0.02	0.01	0.01	0.07	6.13	6.20	1	0.64	0.02	4.9	4.4	4.1	---	---	---	---	---
	91-145	B22h	0.02	0.02	0.04	0.01	0.09	4.40	4.49	2	0.36	0.03	4.7	4.6	4.3	0.18	0.00	0.09	0.05	0.07
Osier fine sand:[2] (S80FL-005-009)	0-23	Ap	0.09	0.05	0.05	0.01	0.20	6.30	6.50	3	1.30	---	4.7	4.2	4.1	---	---	---	---	---
	23-86	A&C	0.02	0.02	0.02	0.00	0.06	3.67	3.73	2	0.45	---	4.8	4.6	4.6	---	---	---	---	---
	86-112	C1	0.02	0.07	0.02	0.00	0.11	2.62	2.73	4	0.18	---	4.7	4.3	4.4	---	---	---	---	---
	112-155	C2	0.05	0.09	0.02	0.00	0.16	1.70	1.86	9	0.10	---	4.5	4.3	4.3	---	---	---	---	---
	155-175	C3	0.04	0.06	0.02	0.00	0.12	1.44	1.56	8	0.10	---	4.2	4.2	4.3	---	---	---	---	---
	175-203	C4	0.03	0.04	0.00	0.00	0.07	1.96	2.03	3	0.13	---	3.5	3.5	3.4	---	---	---	---	---
Pottsburg fine sand:[8] (S80FL-005-010)	0-20	Ap	0.02	0.03	0.05	0.00	0.10	3.14	3.24	3	0.70	0.04	4.5	3.9	3.7	---	---	---	---	---
	20-38	A21	0.01	0.02	0.03	0.00	0.06	2.22	2.28	3	0.43	0.03	4.7	4.4	4.3	---	---	---	---	---
	38-89	A22	0.01	0.01	0.03	0.00	0.05	1.18	1.23	4	0.24	0.03	4.9	4.6	4.6	---	---	---	---	---
	89-107	A23	0.02	0.02	0.02	0.00	0.06	1.31	1.37	4	0.16	0.02	4.9	4.5	4.5	---	---	---	---	---
	107-130	A24	0.04	0.08	0.04	0.00	0.16	3.72	3.88	4	0.28	0.02	4.9	4.4	4.3	---	---	---	---	---
	130-162	B21h	0.01	0.02	0.02	0.00	0.05	7.19	7.24	1	0.82	0.03	4.7	4.5	4.4	0.49	0.02	0.21	0.04	0.12
	162-193	B22h	0.04	0.05	0.10	0.00	0.19	11.44	11.63	2	1.38	0.02	4.1	4.2	4.1	0.82	0.02	0.13	0.08	0.12
	193-208	B3	0.06	0.10	0.02	0.00	0.18	3.72	3.90	5	0.32	0.39	3.7	3.7	3.9	---	---	---	---	---
Resota fine sand: (S79FL-005-004)	0-10	A1	0.14	0.02	0.01	0.01	0.18	4.80	4.98	4	0.36	0.02	5.1	4.1	3.7	---	---	---	---	---
	10-48	A2	0.03	0.01	0.01	0.00	0.05	0.80	0.85	6	0.08	0.01	5.7	4.9	4.3	---	---	---	---	---
	48-68	B21	0.06	0.01	0.01	0.01	0.09	2.00	2.09	4	0.28	0.02	5.2	4.6	4.6	---	---	---	---	---
	68-107	B22	0.03	0.01	0.01	0.00	0.05	1.07	1.12	4	0.13	0.02	5.2	4.8	4.7	---	---	---	---	---
	107-130	C1	0.06	0.02	0.01	0.00	0.09	0.76	0.85	11	0.08	0.02	6.1	5.4	5.1	---	---	---	---	---
	130-203	C2	0.06	0.03	0.00	0.00	0.09	0.48	0.57	16	0.05	0.13	6.2	6.2	5.5	---	---	---	---	--

See footnotes at end of table.

TABLE 18.--CHEMICAL PROPERTIES 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 cations	Base saturation	Organic carbon	Electrical conductivity	pH: H_2O	pH: $CaCl_2$	pH: KCl	Pyrophosphate extractable: C	Pyrophosphate extractable: Fe	Pyrophosphate extractable: Al	Citrate dithionite extractable: Fe	Citrate dithionite extractable: Al
	Cm		----Milliequivalents/100 grams of soil----							Pct	Pct	Mmho /cm				Pct	Pct	Pct	Pct	Pct
Stilson sand:[9] (S80FL-005-015)	0-15	A1	0.32	0.09	0.04	0.04	0.49	5.18	5.67	9	0.95	0.04	5.0	4.5	4.1	---	---	---	---	---
	15-36	A21	0.02	0.02	0.01	0.01	0.06	2.16	2.22	3	0.23	0.03	4.9	4.6	4.5	---	---	---	---	---
	36-81	A22	0.05	0.03	0.01	0.02	0.11	0.26	0.37	30	0.03	0.03	4.8	4.6	4.4	---	---	---	---	---
	81-91	A23	0.05	0.05	0.02	0.01	0.13	1.24	1.37	9	0.02	0.03	4.8	4.5	4.3	---	---	---	---	---
	91-112	B1t	0.09	0.12	0.02	0.01	0.24	1.57	1.81	13	0.00	0.03	4.8	4.5	4.4	---	---	---	0.04	0.03
	112-132	B21t	0.14	0.16	0.02	0.01	0.33	3.21	3.54	9	0.02	0.03	4.8	4.4	4.3	---	---	---	0.03	0.04
	132-152	B22t	0.08	0.18	0.02	0.02	0.30	5.05	5.35	6	0.03	0.03	4.8	4.3	4.2	---	---	---	0.04	0.04
	152-203	B23t	0.05	0.13	0.03	0.01	0.22	6.09	6.31	3	0.02	0.02	4.7	4.3	4.2	---	---	---	0.01	0.04
Troup coarse sand:[10] (S81FL-005-020)	0-10	A1	0.12	0.03	0.01	0.02	0.18	4.34	4.52	4	0.77	0.02	5.2	4.6	4.2	---	---	---	---	---
	10-36	A21	0.03	0.03	0.01	0.01	0.08	2.56	2.64	3	0.30	0.01	5.4	4.5	4.4	---	---	---	---	---
	36-96	A22	0.04	0.02	0.00	0.01	0.07	1.71	1.78	4	0.10	0.01	5.6	4.5	4.5	---	---	---	---	---
	96-142	A23	0.04	0.03	0.01	0.01	0.09	1.43	1.52	6	0.06	0.01	5.5	4.7	4.7	---	---	---	---	---
	142-152	A24	0.09	0.06	0.01	0.01	0.17	1.77	1.94	9	0.04	0.01	5.6	4.1	5.1	---	---	---	---	---
	152-203	B2t	0.09	0.14	0.01	0.01	0.25	3.54	3.79	7	0.25	0.01	5.5	4.7	5.4	---	---	---	1.60	1.37

1 Albany sand:
About 1 mile east of U.S. Highway 231 and 3/4 mile south of John Pitts Road, about 70 feet north of dirt road, NW1/4SW1/4 sec. 10, T. 3 S., R. 13 W.

2 Typical pedon for the series.

3 The pH values were determined using dried soil samples. On moist samples tested in the field, pH values are higher.

4 Chipley fine sand:
About 1/2 mile east of U.S. Highway 231, 2,000 feet south of Linger Longer dirt road, NW1/4SE1/4 sec. 15, T. 1 S., R. 12 W.

5 Foxworth fine sand:
About 1/2 mile east of U.S. Highway 231, 2 miles northeast of Youngstown, south of Linger Longer dirt road, SE1/4NE1/4 sec. 15, T. 1 S., R. 12 W.

6 Lakeland sand:
About 1 1/2 miles west of U.S. Highway 231, 1 1/2 miles south of Bay and Jackson County line, NW1/4SW1/4 sec. 26, T. 2 N., R. 12 W.

7 Leon sand:
About 1 1/5 miles east of U.S. Highway 231, 3/5 mile east of Atlantic and St. Andrews Bay Line Railroad, NE1/4SW1/4 sec. 1, T. 1 N., R. 12 W.

8 Pottsburg fine sand:
About 3/4 mile west of Farmdale Bayou, 1 mile north of U.S. Highway 91 on Tyndall Air Force Base, NW1/4SW1/4 sec. 31, T. 5 S., R. 12 W.

9 Stilson sand:
About 1 1/5 miles west of Gulf County line, 18 miles east of Panama City, 50 feet off right side of dirt road, NE1/4SE1/4 sec. 26, T. 3 S., R. 12 W.

10 Troup coarse sand:
About 1 3/4 miles west of U.S. Highway 231, 1/8 mile north of Sweetwater Creek on west side of dirt road, NE1/4SW1/4 sec. 34, T. 2 N., R. 12 W. Taxadjunct to the Troup series because the particle-size family class is sandy (but only by 0.1 percent clay), and the sand-size fraction is coarser than allowed for the series.

TABLE 19.--CLAY MINERALOGY OF SELECTED SOILS

Soil name and sample number	Depth	Horizon	Percentage of clay minerals					
			Montmor-illonite	14 angstrom intergrade	Kaolinite	Gibbsite	Quartz	Mica
	Cm							
Albany sand:[1]								
(S80FL-005-013)	0-18	A1	0	46	19	8	27	0
	48-109	A22	0	51	30	12	7	0
	137-203	B2t	0	35	52	10	3	0
Allanton sand:[2]								
(S80FL-005-014)	0-25	A11	0	56	8	2	34	0
	81-102	A23	0	78	18	4	0	0
	142-203	B2h	0	0	0	0	100	0
Bayvi loamy sand:[2]								
(S80FL-005-008)	0-20	A11	5	23	41	0	31	0
	122-165	C2	3	42	45	0	10	0
	165-203	C3	18	30	43	0	9	0
Blanton fine sand:[2]								
(S81FL-005-017)	0-10	A1	0	60	23	0	17	0
	51-81	A22	0	60	25	0	15	0
	160-203	B22t	9	48	35	0	8	0
Centenary sand:[2]								
(S79FL-005-002)	0-23	Ap	0	74	0	0	26	0
	79-124	A22	0	72	0	0	28	0
	185-196	B1h	0	29	0	0	71	0
Chipley fine sand:[3]								
(S81FL-005-018)	0-10	A1	18	54	10	0	18	0
	68-96	C2	16	58	11	0	15	0
	155-203	C4	23	49	12	0	16	0
Dirego muck:[2]								
(S79FL-005-007)	71-91	IIC1	22	21	44	0	13	0
	91-102	IIC2	16	15	55	0	14	0
	102-117	IIC3	23	17	45	0	15	0
Foxworth fine sand:[4]								
(S81FL-005-016)	0-10	A1	0	60	21	0	19	0
	20-96	C1	15	49	10	14	12	0
	155-203	C3	21	45	19	0	15	0
Hurricane sand:[2]								
(S79FL-005-001)	0-15	A1	0	77	0	0	23	0
	56-86	A23	0	67	0	0	33	0
	130-140	B1h	0	61	23	0	16	0
Kureb sand:[2]								
(S79FL-005-005)	0-15	A1	37	28	0	0	35	0
	36-64	C&Bh	22	52	13	0	13	0
	190-203	C3	22	52	12	0	14	0
Lakeland sand:[5]								
(S81FL-005-019)	0-13	A1	17	48	17	0	18	0
	25-96	C1	25	51	13	0	11	0
	162-203	C3	24	49	10	0	17	0
Leon sand:[6]								
(S79FL-005-003)	0-15	A1	0	38	0	0	62	0
	46-58	B2h	0	50	0	0	50	0
	135-203	B'h	0	29	0	0	71	0
Mandarin sand:[2]								
(S79FL-005-006)	0-18	A1	13	34	21	0	32	0
	64-91	B21h	15	45	12	0	28	0
	91-145	B22h	17	48	13	0	22	0

See footnotes at end of table.

TABLE 19.--CLAY MINERALOGY OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Percentage of clay minerals					
			Montmor-illonite	14 angstrom intergrade	Kaolinite	Gibbsite	Quartz	Mica
	Cm							
Osier fine sand:[2] (S80FL-005-009)	0-23	Ap	4	86	3	0	7	0
	23-86	A&C	3	43	13	0	41	0
	86-112	C1	6	58	23	0	13	0
	175-203	C4	16	10	62	0	7	5
Pottsburg fine sand:[7] (S80FL-005-010)	0-20	Ap	16	26	14	0	44	0
	130-162	B21h	13	15	40	0	32	0
	193-208	B3	0	14	60	0	11	0
Resota fine sand:[2] (S79FL-005-004)	0-10	A1	19	21	24	0	36	0
	48-68	B21	11	44	13	0	32	0
	130-203	C2	7	42	13	0	38	0
Stilson sand:[8] (S80FL-005-015)	0-15	A1	0	60	12	17	11	0
	112-132	B21t	0	38	24	34	4	0
	152-203	B23t	0	22	42	29	7	0
Troup coarse sand:[9] (S81FL-005-020)	0-10	A1	0	62	12	0	26	0
	36-96	A22	17	54	14	0	15	0
	152-203	B2t	11	35	10	36	8	0

[1] Albany sand:
About 1 mile east of U.S. Highway 231 and 3/4 mile south of John Pitts Road, about 70 feet north of dirt road; NW1/4SW1/4 sec. 10, T. 3 S., R. 13 W.

[2] Typical pedon for the series.

[3] Chipley fine sand:
About 1/2 mile east of U.S. Highway 231, 2,000 feet south of Linger Longer dirt road, NW1/4SE1/4 sec. 15, T. 1 S., R. 12 W.

[4] Foxworth fine sand:
About 1/2 mile east of U.S. Highway 231, 2 miles northeast of Youngstown, south of Linger Longer dirt road, SE1/4NE1/4 sec. 15, T. 1 S., R. 12 W.

[5] Lakeland sand:
About 1 1/2 miles west of U.S. Highway 231, 1 1/2 miles south of Bay and Jackson County line, NW1/4SW1/4 sec. 26, T. 2 N., R. 12 W.

[6] Leon sand:
About 1 1/5 miles east of U.S. Highway 231, 3.5 mile east of Atlantic and St. Andrews Bay Line Railroad, NE1/4SW1/4 sec. 1, T. 1 N., R. 12 W.

[7] Pottsburg fine sand:
About 3/4 mile west of Farmdale Bayou, 1 mile north of U.S. Highway 91 on Tyndall Air Force Base, NW1/4SW1/4 sec. 31, T. 5 S., R. 12 W.

[8] Stilson sand:
About 1 1/5 miles west of Gulf County line, 18 miles east of Panama City, 50 feet off right side of dirt road, NE1/4SE1/4 sec. 26, T. 3 S., R. 12 W.

[9] Troup coarse sand:
About 1 3/4 miles west of U.S. Highway 231, 1/8 mile north of Sweetwater Creek on west side of dirt road, NE1/4SW1/4 sec. 34, T. 2 N., R. 12 W. Taxadjunct to the Troup series because the particle-size family class is sandy (but only by 0.1 percent clay), and the sand-size fraction is coarser than allowed for the series.

TABLE 20.--ENGINEERING INDEX TEST DATA

[Tests performed by the Florida Department of Transportation in cooperation with the U.S. Bureau of Public Roads, in accordance with standard procedures of the American Association of State Highway and Transportation Officials (AASHTO). See the section "Soil Series and Their Morphology" for location of typical pedons sampled. NP means nonplastic]

Soil name, report number, horizon, and depth in inches	Classification		Percentage passing sieve--				Liquid limit	Plasticity index	Moisture density[2]	
	AASHTO[1]	Unified	No. 4	No. 10	No. 40	No. 200			Maximum dry density	Optimum moisture
							Pct		Lb/ft3	Pct
Albany sand:[4] (S80FL-005-013) B2t----54-80	A-2-4(0)	SM	100	100	90	28	--	NP	117.5	12.3
Allanton sand:[3] (S80FL-005-014) B2h----56-80	A-3(0)	SP-SM	100	100	82	6	--	NP	105.5	13.8
Blanton fine sand:[3] (S81FL-005-017) B22t----63-80	A-2-4(0)	SM	100	100	96	28	--	NP	113.5	13.5
Centenary sand:[3] (S79FL-005-002) A21----9-31	A-3(0)	SP-SM	100	100	77	9	--	NP	108.9	12.1
Chipley fine sand:[5] (S81FL-005-018) C3----38-61	A-3(0)	SP-SM	100	100	93	9	--	NP	104.7	11.8
Foxworth fine sand:[6] (S81FL-005-016) C1----8-38	A-3(0)	SP-SM	100	100	94	10	--	NP	106.2	10.7
Hurricane sand:[3] (S79FL-005-001) A22----10-22	A-3(0)	SP-SM	100	100	78	7	--	NP	109.1	12.2
Kureb sand:[3] (S79FL-005-005) C1----25-75	A-3(0)	SP	100	100	97	4	--	NP	102.3	14.4
Lakeland sand:[7] (S81FL-005-019) C1----10-38	A-3(0)	SP-SM	100	100	84	6	--	NP	104.9	13.1
Leon sand:[8] (S79FL-005-003) A2----6-18	A-3(0)	SP-SM	100	100	78	7	--	NP	105.4	11.9
Mandarin sand:[3] (S79FL-005-006) A2----7-25	A-3(0)	SP	100	100	94	3	--	NP	98.8	15.3
Osier fine sand:[3] (S80FL-005-009) A&C----9-34	A-3(0)	SP-SM	100	100	96	7	--	NP	104.6	12.4
Pottsburg fine sand:[9] (S80FL-005-010) B21h----51-64	A-3(0)	SP	100	100	95	4	--	NP	101.1	15.7
Resota fine sand:[3] (S79FL-005-004) B22----27-42	A-2-4(0)	SP-SM	100	100	97	11	--	NP	104.5	14.0

See footnotes at end of table.

TABLE 20.--ENGINEERING INDEX TEST DATA--Continued

Soil name, report number, horizon, and depth in inches	Classification		Percentage passing sieve--				Liquid limit	Plasticity index	Moisture[2] density	
	AASHTO[1]	Unified	No. 4	No. 10	No. 40	No. 200			Maximum dry density	Optimum moisture
							Pct		Lb/ft^3	Pct
Stilson sand:[10] (S80FL-005-015)										
B21t----------------44-60	A-6(1)	SC	100	100	89	39	32	13	111.7	15.5

1 Based on AASHTO Designation M145-73.
2 Based on AASHTO Designation T99-74.
3 Typical pedon for the series.
4 Albany sand:
About 1 mile east of U.S. Highway 231 and 3/4 mile south of John Pitts Road, about 70 feet north of dirt road, NW1/4SW1/4 sec. 10, T. 3 S., R. 13 W.
5 Chipley fine sand:
About 1/2 mile east of U.S. Highway 231, 2,000 feet south of Linger Longer dirt road, NW1/4SE1/4 sec. 15, T. 1 S., R. 12 W.
6 Foxworth fine sand:
About 1/2 mile east of U.S. Highway 231, 2 miles northeast of Youngstown, south of Linger Longer dirt road, SE1/4NE1/4 sec. 15, T. 1 S., R. 12 W.
7 Lakeland sand:
About 1 1/2 miles west of U.S. Highway 231, 1 1/2 miles south of Bay and Jackson County line, NW1/4SW1/4 sec. 26, T. 2 N., R. 12 W.
8 Leon sand:
About 1 1/5 miles east of U.S. Highway 231, 3/5 mile east of Atlantic and St. Andrews Bay Line Railroad, NE1/4SW1/4 sec. 1, T. 1 N., R. 12 W.
9 Pottsburg fine sand:
About 3/4 mile west of Farmdale Bayou, 1 mile north of U.S. Highway 91 on Tyndall Air Force Base, NW1/4SW1/4 sec. 31, T. 5 S., R. 12 W.
10 Stilson sand:
About 1 1/5 miles west of Gulf County line, 18 miles east of Panama City, 50 feet off right side of dirt road, NE1/4SE1/4 sec. 26, T. 3 S., R. 12 W.

TABLE 21.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Alapaha	Loamy, siliceous, thermic Arenic Plinthic Paleaquults
Albany	Loamy, siliceous, thermic Grossarenic Paleudults
Allanton	Sandy, siliceous, thermic Grossarenic Haplaquods
Arents	Arents
Bayvi	Sandy, siliceous, thermic Cumulic Haplaquolls
Blanton	Loamy, siliceous, thermic Grossarenic Paleudults
Bonifay	Loamy, siliceous, thermic Grossarenic Plinthic Paleudults
Centenary	Sandy, siliceous, thermic Grossarenic Entic Haplohumods
Chipley	Thermic, coated Aquic Quartzipsamments
Corolla	Thermic, uncoated Aquic Quartzipsamments
Dirego	Sandy or sandy-skeletal, siliceous, euic, thermic Terric Sulfihemists
Dorovan	Dysic, thermic Typic Medisaprists
Ebro	Dysic, thermic Typic Medisaprists
Foxworth	Thermic, coated Typic Quartzipsamments
Fripp	Thermic, uncoated Typic Quartzipsamments
Hurricane	Sandy, siliceous, thermic Grossarenic Entic Haplohumods
Kureb	Thermic, uncoated Spodic Quartzipsamments
Lakeland	Thermic, coated Typic Quartzipsamments
Leefield	Loamy, siliceous, thermic Arenic Plinthaquic Paleudults
Leon	Sandy, siliceous, thermic Aeric Haplaquods
Mandarin	Sandy, siliceous, thermic Typic Haplohumods
Osier	Siliceous, thermic Typic Psammaquents
Pamlico	Sandy or sandy-skeletal, siliceous, dysic, thermic Terric Medisaprists
Pansey	Fine-loamy, siliceous, thermic Plinthic Paleaquults
Pantego	Fine-loamy, siliceous, thermic Umbric Paleaquults
Pelham	Loamy, siliceous, thermic Arenic Paleaquults
Pickney	Sandy, siliceous, thermic Cumulic Humaquepts
Plummer	Loamy, siliceous, thermic Grossarenic Paleaquults
Pottsburg	Sandy, siliceous, thermic Grossarenic Haplaquods
Rains	Fine-loamy, siliceous, thermic Typic Paleaquults
Resota	Thermic, uncoated Spodic Quartzipsamments
Rutlege	Sandy, siliceous, thermic Typic Humaquepts
Sapelo	Sandy, siliceous, thermic Ultic Haplaquods
Stilson	Loamy, siliceous, thermic Arenic Plinthic Paleudults
Troup	Loamy, siliceous, thermic Grossarenic Paleudults

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