United States
Department of
Agriculture

Soil
Conservation
Service

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

Soil Survey of Polk County, Florida

How To Use This Soil Survey

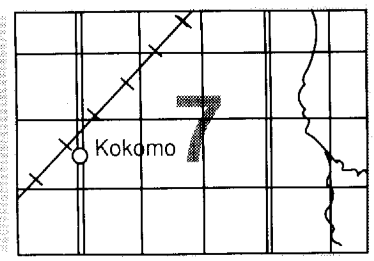
General Soil Map

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

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

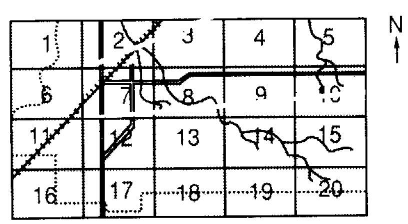
Detailed Soil Maps

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



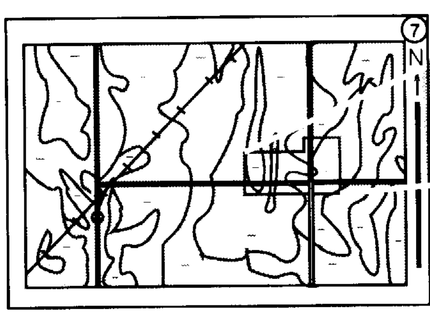
MAP SHEET

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



INDEX TO MAP SHEETS

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



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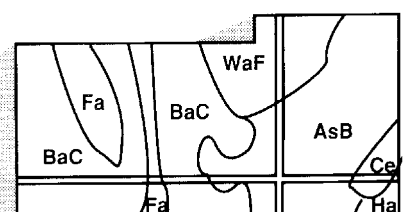

AREA OF INTEREST

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

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

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

Major fieldwork for this soil survey was completed in 1985. Soil names and descriptions were approved in 1986. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1985. This soil survey was made cooperatively by the Soil Conservation Service; 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. The survey is part of the technical assistance furnished to the Polk County Soil and Water Conservation District. The Polk County Board of County Commissioners contributed financially. Additional assistance was provided by the Florida Department of Transportation.

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

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

Cover: Urban area and citrus grove in an area of Candler sand, 0 to 5 percent slopes.

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Issued October 1990

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Summary of Tables

Foreword

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

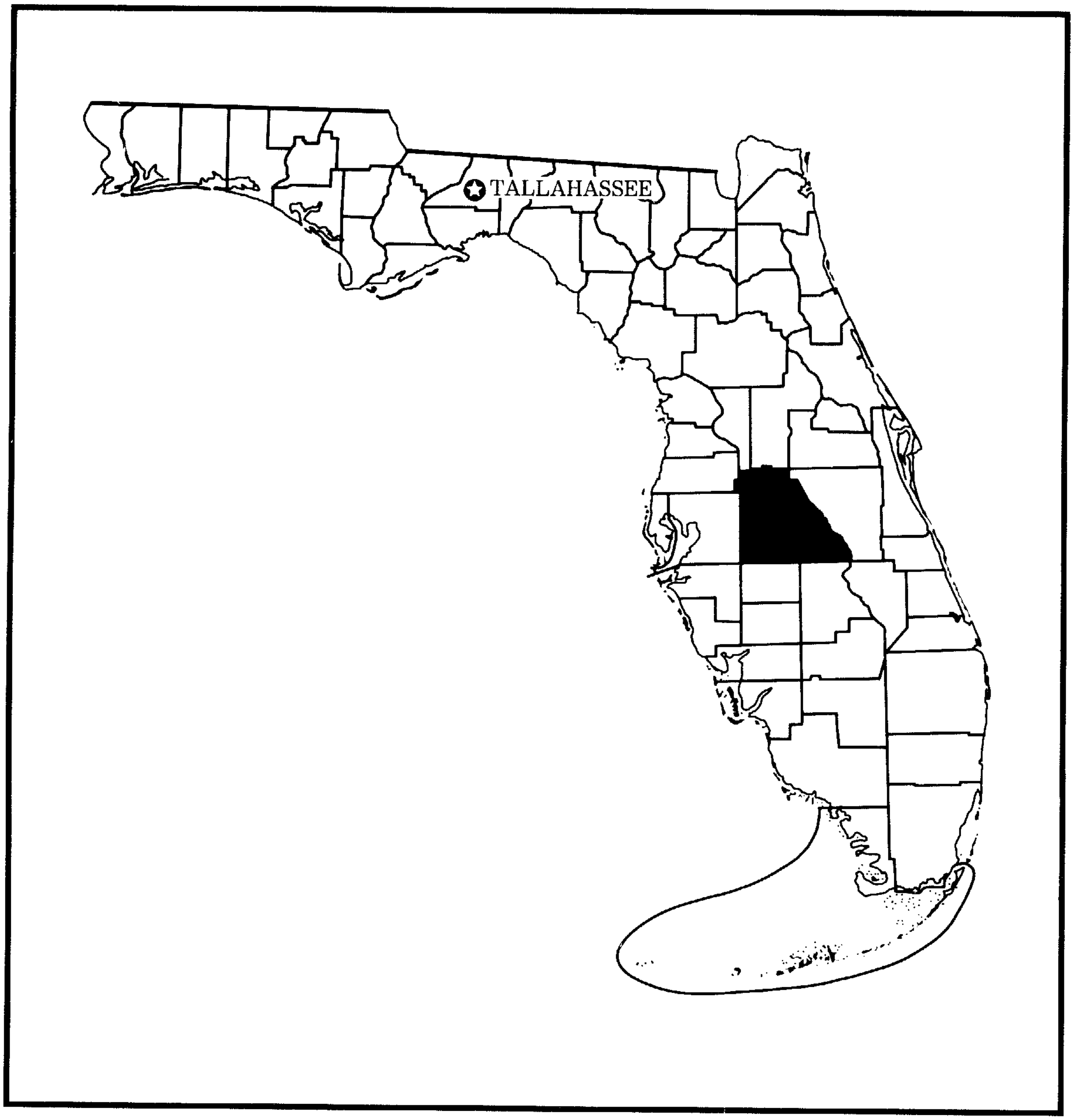
This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use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

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

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

Niles Glasgow

T. Niles Glasgow
State Conservationist
Soil Conservation Service



Location of Polk County in Florida.

Soil Survey of
Polk County, Florida

By Richard D. Ford, John M. Robbins, Jr., Jeffrey T. Werner, Dean Cowherd, Charles N. Gordon, William B. Warmack, Mark M. Brown, Kenneth W. Monroe, Walter G. George, Therman Sanders, and Phyllis M. Basch, Soil Conservation Service

Others participating in fieldwork were Thomas D'Auello, Frederick Phillip Aziz, John E. Campbell, Douglas L. Lewis, and John A. Lindahl

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

POLK COUNTY is in the central part of Florida. It is bordered on the north by Sumter and Lake Counties, on the east by Osceola County, on the south by Highlands and Hardee Counties, and on the west by Hillsborough and Pasco Counties. Bartow, the county seat, is in the southwest part of the county.

The county covers 1,286,611 acres, or 2,010 square miles. The land area covers 1,166,803 acres, or 1,823 square miles. Bodies of water that are at least 40 acres in size cover 119,808 acres, or 187 square miles.

About 27,566 acres, or 44 square miles, is federally owned. This land includes part of the Avon Park Air Force Bombing Range.

Land use is mainly agriculture and woodland. About 44 percent of the land is cropland, pasture, or rangeland; and 23 percent is woodland. The present trend is a decreasing acreage of cropland, pasture, rangeland, and woodland and an increasing acreage of urban land and mine land.

The county is in the Southern Florida Flatwoods and South Central Florida Ridge Major Land Resource Areas (MLRA's). The Southern Florida Flatwoods MLRA consists mainly of nearly level, poorly drained soils. These soils are used generally as pasture, rangeland, or woodland.

The South Central Florida Ridge MLRA consists of nearly level to moderately sloping, sandy soils that range from excessively drained to very poorly drained. These soils are used mainly as pasture, rangeland, cropland, or woodland. Most of the citrus in the county grows on these soils.

None of the soils in Polk County meet all of the requirements for prime farmland soils as defined by the U.S. Department of Agriculture. The soils are either too wet from a seasonal high water table or flooding or they are too droughty during the growing season of most crops.

Descriptions, names, and delineations of soils in this soil survey do not fully agree with those on the soil maps of adjacent counties. Differences are the result of better knowledge of soils, modifications in series concepts, intensity of mapping, or the extent of soils within the survey.

This survey updates a soil survey of Polk County that was published in 1927 and provides additional information *(21)*.

General Nature of the County

This section gives general information about history and development, climate, geology. farming and mining, water resources, and transportation facilities in Polk County.

History and Development

Louise K. Frisbie, columnist and author, Polk County Democrat, helped prepare this section.

Polk County is the fourth largest county in area in Florida *(7, 8)*. It is larger than the state of Rhode Island and almost as large as Delaware. The county is in the center of the Florida peninsula.

The earliest settlers arrived in the 1840's and 1850's. They were almost self-sufficient. Fish and game, small gardens, trees for building homes, and cotton and wool were plentiful. Other items could be purchased at the army camp at Fort Meade or in the village of Tampa.

Polk County was established in 1861, mostly from the eastern part of Hillsborough County. The early settlers struggled to organize the county during the Civil War and the difficult years that followed. In 1867, cattle baron Jacob Summerlin gave the county 120 acres of land on the condition that Bartow be made the county seat.

During the Second Seminole War, which lasted from 1835 to 1842, the U.S. Army cut two-rutted wagon trails through the area. These trails were the first roads. In the early 1880's, the county's roads were described as almost impassable. It was not until the early 20th century and the advent of the automobile that the towns and cities in Polk County were joined by a network of hard surface roads. The main highways were 15 feet wide, and the others were 9 feet wide.

Only a few settlements were in the county before the coming of the railroads in the 1880's. In 1883, as Henry B. Plant pushed his "Iron Horse" rails south from Kissimmee, the towns of Loughman, Davenport, Haines City, Lake Alfred, Auburndale, and Lakeland were established along the right-of-way, in almost the exact order that those areas were reached by the trains. Lakeland is now the largest city in Polk County. Other railroad lines soon reached Winter Haven, Bartow, and Fort Meade. As the trains came, citrus and truck crops were grown for shipment by rail to northern markets.

Pebble phosphate was discovered in the late 1880's. Land prices soared in the 1890's, and many families found fortunes in that boom. Another source of the county's wealth has been the beef cattle industry. The principal industries currently include phosphate mining, citrus and vegetable crops, and beef production.

Long-standing tourist attractions include Cypress Gardens at Winter Haven, the carillon and bird sanctuary that was established in 1929 by publisher Edward Bok near Lake Wales, and a passion play that is presented each winter in an outdoor amphitheater near Lake Wales.

Climate

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

In Polk County the long summers are hot and humid. Winters are warm, only occasionally interrupted by incursions of cool air from the north. Rains occur throughout the year, and precipitation is adequate for all crops. Every few years a hurricane crosses the area.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Bartow, Florida, in the period 1951 to 1984. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 62 degrees F, and the average daily minimum temperature is 50 degrees. The lowest temperature on record, which occurred at Bartow on December 13, 1962, is 18 degrees. In summer the average temperature is 82 degrees, and the average daily maximum temperature is 92 degrees. The highest recorded temperature, which occurred at Lakeland on June 12, 1977, is 103 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is about 54 inches. Of this, about 70 percent usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 32 inches. The heaviest 1-day rainfall during the period of record was 4.72 inches at Bartow on March 16, 1960. Thunderstorms occur on about 87 days each year.

Snowfall is rare. In 99 percent of the winters, there is no measurable snowfall. In 1 percent, the snowfall, usually of short duration, is less than 1 inch. The heaviest 1-day snowfall on record was 1 inch.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 90 percent. The sun shines 70 percent of the time possible in summer and 65

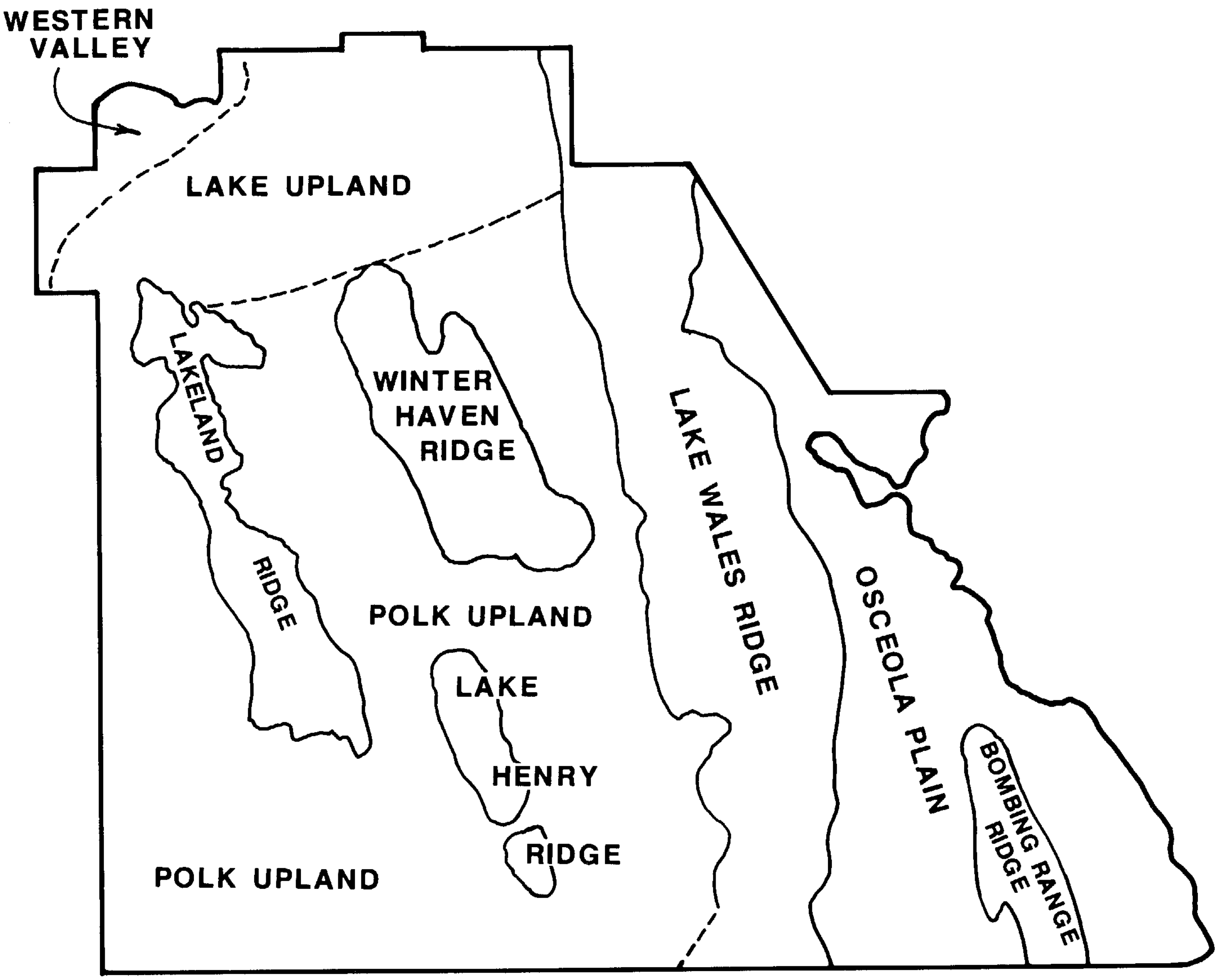


Figure 1.—Generalized physiographic map of Polk County and vicinity.

percent in winter. The prevailing wind is from the east. Average windspeed is highest, 10 miles per hour, in spring.

Geology

Kenneth M. Campbell, Florida Geological Survey, Bureau of Geology. Department of Natural Resources, prepared this section.

Physiography

Polk County is in the Central Highlands physiographic province, mainly on the Polk and Lake Uplands (fig. 1). The eastern part of the county is part of the Osceola Plain, and a small area in the northwestern corner is in the Western Valley *(22)*.

The elevation ranges from 50 to 305 feet above National Geodetic Vertical Datum (NGVD). The lowest elevation is in the Kissimmee River Valley, and the highest elevation is along the crest of the Lake Wales Ridge near Lake Wales and Babson Park *(14)*.

Polk and Lake Uplands. Most of Polk County is in the Polk and Lake Upland areas. Several ridges rise above the Polk Upland surface. The most prominent is the Lake Wales Ridge. Others include the Lakeland, Winter Haven, and Lake Henry Ridges, which appear to be remnants of a previous widespread upland *(22)*.

The elevation of the Polk Upland generally ranges between 100 to 130 feet above NGVD. It is higher on the ridges. In the northern part of the county, the Polk Upland merges with the Lake Upland. The two uplands do not have a distinct topographic distinction; therefore, the boundary is drawn arbitrarily *(22)*. The Polk Upland is bordered by the Gulf Coastal Lowlands and the Western Valley on the west and north, the DeSoto Plain on the south, and by the Lake Wales Ridge on the east.

The Lake Wales Ridge is the most prominent topographic feature in peninsular Florida. It is the distal remnant of a much longer ridge that at one time may have included the Trail Ridge in northeastern Florida. The elevation is from 150 to 305 feet above NGVD and is highest at Lake Wales and Babson Park *(14)*. The ridge is made up mainly of coarse clastic material that has been dissected by streams and karst activity. It has been straightened on its flanks by coastal erosion to produce its present western bounding scarp and a probable buried former eastern bounding scarp *(22)*. The preservation of the Lake Wales Ridge as a present day highland is thought to be the result of the clayey, gravelly, coarse quartz sand having limited but not completely prevented dissolution of the underlying limestone.

Osceola Plain. The part of Polk County east of the Lake Wales Ridge is in the western part of the Osceola Plain. The Osceola Plain, a marine terrace, is bounded on the west by the Lake Wales Ridge and on the east by lower-lying marine scarps. Local relief generally is low, and the elevation typically is between 60 and 70 feet above NGVD *(22)*, although it is somewhat lower along the Kissimmee River chain. In the southeastern corner of the county, the Bombing Range Ridge rises above the level of the plain. This ridge is 21 miles long and 3 to 4 miles wide. It reaches an elevation of 125 to 145 feet above NGVD, and has all the attributes of a large marine sand bar *(22)*.

Western Valley. A small part of northwestern Polk County is on the eastern flank of the southern part of the Western Valley. The Western Valley is a low, irregularly shaped valley produced by differential reduction of unprotected soluble material adjacent to the Brooksville Ridge and Polk Upland. The elevation ranges from 75 to 100 feet above NGVD.

Lithostratigraphy

The surface and near surface sediments in Polk County consist of quartz sand, clay, phosphorite, limestone, and dolomite (fig. 2). These sediments range in age from Late Eocene age to Holocene age (40 million years ago to present).

Eocene Series

The Eocene Series in Polk County consists of the Oldsmar, Avon Park, and Ocala Group limestones. Only the uppermost unit, the Ocala Group, is described here.

The Ocala Group consists of three formations, which in ascending order are the Inglis, Williston, and Crystal River Formations. Essentially, all of Polk County is underlain by limestone of the Ocala Group.

The *Inglis Formation* consists of white to cream to dark brown, granular, fossiliferous, well indurated limestone and dolomite. The thickness of this formation ranges from about 35 feet in the northwestern part of the county to as much as 95 feet in the southeastern part. Because of the erosion of overlying units, this formation is the uppermost limestone in extreme northeastern Polk County *(14)*.

The *Williston Formation* is a white to cream or brown limestone consisting of a coquina of foraminifera set in a pasty calcilutite matrix. This formation generally is poorly indurated and may be dolomitized. It underlies most of the county but does not occur in the extreme northeastern part of the county. It is 10 to 90 feet thick *(14)*.

The *Crystal River Formation* is a white, cream, gray, or tan, very pure limestone. This formation generally is poorly indurated and consists of a coquina of large foraminifera in a chalky calcilutite matrix. It is at or near the surface over a large area of northern Polk County. In this area, it is 30 to 60 feet thick, but it thickens southward to about 150 feet *(14)*. The formation is silicified throughout much of the surface exposure area of northern Polk County.

Oligocene Series

The *Suwannee Limestone* is throughout the western part of Polk County but is not in the northern and eastern parts of the county because of the erosion on the flanks of the Ocala Uplift (northwest-southeast trend). The Suwannee Limestone is white, cream, or tan, variably textured, fossiliferous, poorly indurated to well indurated, and variably recrystallized. Locally, the formation contains dolomitized or silicified zones *(14)*. Common fossils include benthic foraminifera, bryozoans, mollusks, and echinoids.

The top of the Suwannee Limestone is 70 to 80 feet above NGVD in the area north of Lakeland and west of

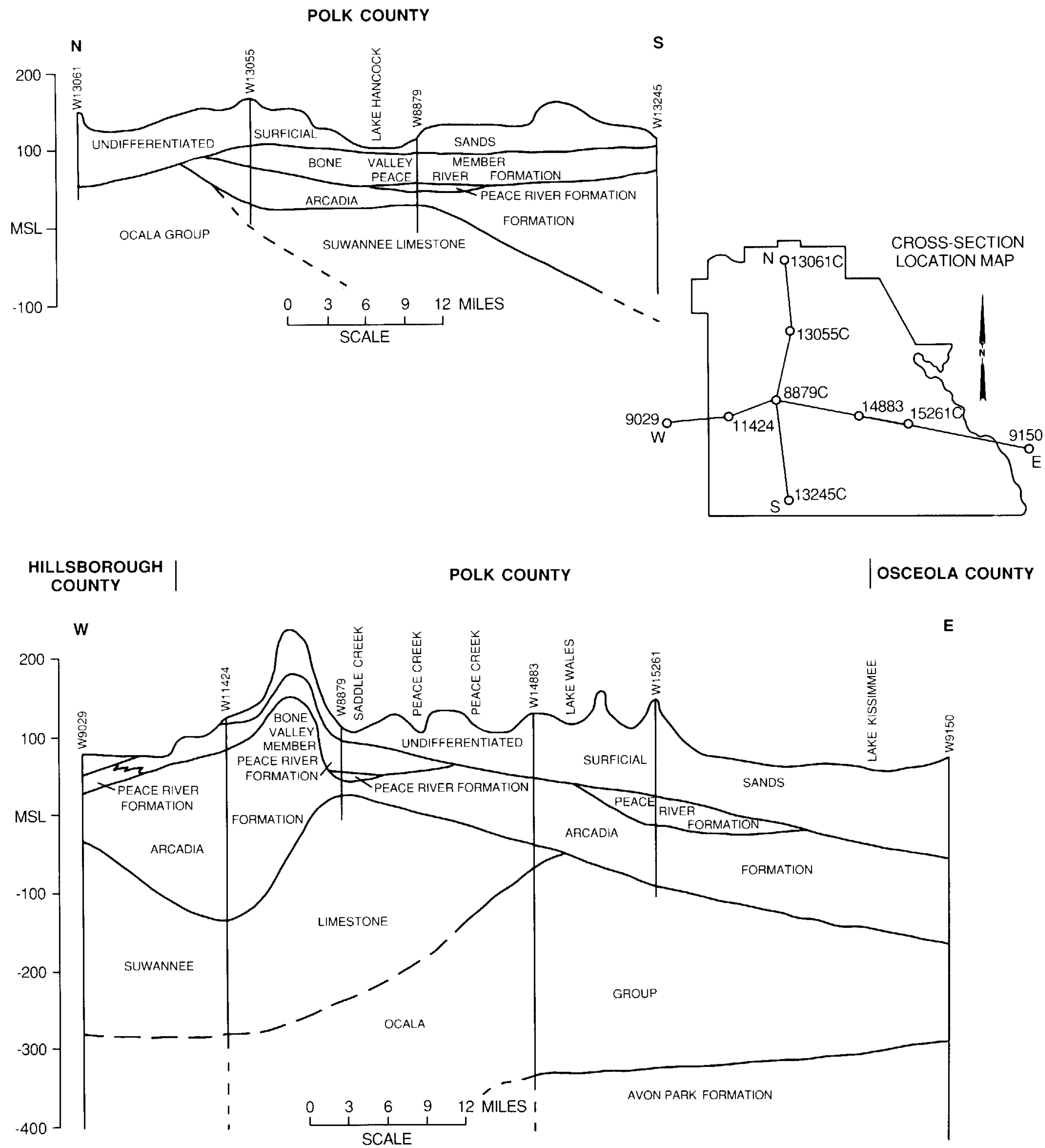


Figure 2.—Cross-section location map and north-to-south and west-to-east lithostratigraphic cross sections in Polk County. Well numbers followed by "C" are cores.

Polk City. It dips gently to the south and south-southwest. Along the western half of the southern boundary of the county, the Suwannee Limestone is about 250 to 300 feet below NGVD *(23)*. Along the eastern edge of the Suwannee Limestone along the trend of the Ocala Uplift, the formation thins to zero. It is thickest (100 to 150 feet) south of Lakeland and Bartow.

Miocene Series

The *Hawthorn Group* has been raised from formation status to group status *(13)*. It includes sediments that were included in the Tampa, Hawthorn, and Bone Valley Formations in the past. The Hawthorn Group consists of the Arcadia Formation and the Peace River Formation, in ascending order.

The *Arcadia Formation* includes, in ascending order, the Nocatee and Tampa Members and an unnamed member. The Nocatee Member is made up of the sediment that was previously described as the "sand and clay unit" of the Tampa Limestone *(23)*. The Tampa Member includes the sediment of the Tampa Formation of King and Wright *(9)*. The unnamed (upper) member includes the sediments that have been referred to in the past as the "Hawthorn carbonate unit" *(13)*.

The Nocatee Member consists of a complex, interbedded sequence of variably phosphatic quartz sand, clay, and carbonate. It is predominantly a sand and clay unit. Typically, quartz sand is fine to coarse grained, sometimes silty, clayey, calcareous or dolomitic, and variably phosphatic *(13)*. Clay beds are common. The clay is variably quartz sandy and silty, phosphatic, and calcareous to dolomitic. Carbonate beds are subordinate.

The Nocatee Member is only in the southwestern corner of the county. The top of the formation is 81 to 150 feet below NGVD *(13)*. This member is less than 50 to slightly more than 100 feet thick. The surface dips generally to the south and southeast. The limits of the formation are mainly by facies change.

The Tampa Member is lithologically similar to the Tampa Formation of King and Wright *(9)*, but it has a slightly higher content of phosphate (1 to 3 percent) and larger areal extent *(13)*. The Tampa Member is white to tan, quartz sandy limestone that has a carbonate mud matrix. Varying amounts of clay generally are disseminated throughout the rock. Some beds contain more than 50 percent quartz sand, and dolomite is relatively uncommon *(9, 13)*.

The Tampa Member is only in the southwestern corner of Polk County. It becomes indistinct because of a facies change at its eastern extent. The top of this member is slightly more than 50 feet above NGVD to about 150 feet below NGVD in the extreme southwestern corner of the county. It is less than 50 feet thick *(13)*.

The upper (unnamed) member of the Arcadia Formation includes sediments known previously as the "Hawthorn carbonate unit." Lithologically, these sediments are white to yellowish gray, quartz sandy, phosphatic, and sometimes clayey dolomite and limestone (uncommon). Occasional beds of carbonate-rich quartz sand and thin clay beds are present.

The upper member of the Arcadia Formation is throughout Polk County except in the northernmost part. In those areas where the Tampa and Nocatee Members are not recognized, the entire formation remains undifferentiated. The top of the formation ranges from 112 feet above NGVD near Lakeland to about 125 feet below NGVD in the southeastern corner of the county. The thickness of the Arcadia Formation ranges from zero at its northern extent to about 300 feet in the southwest corner of the county. In general, the formation dips to the south and southeast *(13)*.

The *Peace River Formation* includes a downdip unnamed member and the updip Bone Valley Member, formerly the Bone Valley Formation *(10, 13)*. Lithologically, the unnamed member is yellowish gray to light olive green interbedded sand, clay, and dolomite with variable phosphate content. It has been described in the past as "upper Hawthorn clastics." The Bone Valley Member is "all the phosphorite pebble or gravel bearing beds with sand-size phosphorite in a sandy to clayey matrix" *(13)*.

The Peace River Formation is throughout Polk County except in the northernmost part. The Bone Valley Member is only in the western part of the county and thins in all directions from a center of deposition in the Bartow-Mulberry area *(3, 13)*. Throughout much of the area underlain by the Bone Valley Member, this member makes up the entire Peace River Formation and is directly underlain by the Arcadia Formation *(13)*. In southernmost Polk County, the Bone Valley Member interfingers laterally and vertically with the undifferentiated Peace River Formation. Only the undifferentiated Peace River Formation is in the eastern part of the county *(13)*.

The Bone Valley Member of the Peace River Formation is as high as 175 feet above NGVD in southwestern Polk County. The top of this member throughout much of its extent occurs above 100 feet NGVD. The top of the Peace River Formation dips to the east to slightly more than 50 feet below NGVD. The Peace River formation generally is less than 50 feet thick *(13)*. The Bone Valley Member has a maximum thickness of about 50 feet.

Pliocene-Pleistocene Series

Undifferentiated surficial sand, clayey sand, and clay blanket essentially all of Polk County. These sediments range in age from Pliocene *(13)* to Pleistocene (5.3 million to 10,000 years ago). The Lake Wales and Winter Haven Ridges consist of clayey, micaceous, quartz pebbly sand that has been described in the past as Miocene coarse clastics. These sediments are presently thought to be Pliocene in age and are included in the undifferentiated surficial sediments.

In general, the surficial sediments are thinnest in the southwestern part of the county and are thicker to the north and east and beneath the ridges. The undifferentiated surficial sediments are less than 10 feet to more than 120 feet thick.

Holocene Series

Deposits of Holocene age (10,000 years ago to present) are mainly limited to present stream flood plains, beaches, swamps, marshes, and lakes. They consist of sand, silt, clay, and organic material.

Farming and Mining

James A. Stricker, county extension director, helped prepare this section.

Polk County is the leading citrus-producing county in the United States *(6)* with 129,912 acres in 1985-86. Citrus is well adapted to the deep, excessively drained, moderately well drained, and well drained Candler, Tavares, and Apopka soils. The rolling topography provides some frost protection through air drainage on calm, cold nights. The many lakes also help moderate temperatures, typically on the south and east sides of the lakes. Some citrus is grown on flatwoods, mostly on the Smyrna, Myakka, and Immokalee soils. These soils generally are modified for citrus production by bedding, with one or two rows of trees on a bed and ditches between beds for drainage and moisture management.

The most extensive land uses in the county are pasture and range. More than 200,000 acres is in these uses. Pasture and rangeland are typically on soils of the flatwoods. These soils are nearly level and poorly drained. During the wet season, the water table is near or above the surface in most areas.

Pasture and range forage is mainly used by beef animals, specifically, cow-calf herds. In 1985, about 65,000 cows produced 50,000 calves. Since little or no high energy feed is produced in central Florida, calves are shipped to feedlots in the West and Midwest States.

Vegetable crops are of relatively minor significance when compared to citrus. Melons are grown on about 1,000 acres, and tomatoes and peas are grown on about 600 acres each. These acreage totals include double cropping; for example, 1 acre cropped in spring and in late summer is counted as 2 acres. Greens, squash, cucumbers, sweet corn, peanuts, and bell peppers are among the other vegetable crops. The acreage varies from year to year depending on market conditions. Strawberries are also grown, mainly in the west-central part of the county.

Traditionally, vegetable crops are grown on rented land, newly cleared from brush and palmettos. Soils on flatwoods are generally used. A farmer clears the land and drills irrigation wells in return for use of the land for a year or two. In this period, nematodes and plant pathogens build up in the soil. The farmer moves on to new land, and the landowner has cleared land on which to establish improved pasture. If vegetables are to be grown for a longer period, the soil must be fumigated to kill the nematodes and plant pathogens or yields will be reduced.

Although not highly visible, tropical fish farming in Polk County generated about $5 million in sales from nearly 80 acres of ponds in 1985. Increasing foreign competition is limiting the growth of this highly intensive agricultural enterprise.

Ornamental and nursery crops are second only to tropical fish production in intensity of land use. In 1985, about 1,650 acres produced an estimated $36 million in onfarm value. Woody ornamental plants accounted for 83 percent of the total. Foliage and potted flowering plants make up the balance.

West-central and southwestern Polk County are major phosphate mining areas. Mining began in the county in the 1880's, and over the past hundred years, about 140,000 acres has been mined. About 3,000 to 4,000 acres per year is currently being mined. All land mined after July 1, 1975, must, by law, be reclaimed. An "old lands" fund was created to reclaim land mined before that date.

Three basic land types remain after mining: phosphatic clay, overburden, and sand tailings. Phosphatic clay is pumped into settling ponds at about 2 percent solids. After drying out, a 100 percent clay material is left. Overburden is a heterogeneous mixture of sand and clay that was stripped from the top of the ore body and cast aside in the mining process. Sand tailings are pure quartz sand that has a high content of phosphate. Today, most sand tailings are pumped into mining cuts and capped with overburden as part of the reclamation process.

The Polk County Board of County Commissioners, the Institute of Food and Agricultural Sciences of the University of Florida, and the phosphate industry (funded largely by the Florida Institute for Phosphatic Research) are currently involved in a joint research effort to explore potential production of high value crops on phosphatic clay. Phosphatic clay has many desirable agronomic characteristics including desirable pH (highly buffered), high phosphate levels, high calcium levels, and high available water capacity. Disadvantages are poor trafficability when wet and a potential unstable surface because of a liquid or semiliquid subsurface in newly reclaimed settling ponds.

A small amount of citrus is being established on overburden and sand tailings. A potential for growing citrus exists on overburden soils, but research is needed to determine best varieties, root stocks, and cultural practices.

Water Resources

In Polk County, water is used for municipal, industrial, and agricultural purposes. In most of the county, the water supply is adequate for domestic use, irrigation of crops, and the watering of livestock late in spring, in summer, and early in autumn. Low rainfall, however, causes a shortage of water in most winters.

The development of land for agriculture and mining has decreased the supply of water from surface and ground water storage. Agriculture consumptive use of water has placed a higher demand on water for irrigation. High value crops are now routinely irrigated. Mining companies also use a great deal of water in processing minerals extracted from the earth. In Polk County, water resources are managed by the Southwest Florida, South Florida, and St. Johns River Water Management Districts.

The water in Polk County comes mainly from the Floridan Aquifer *(14)*, which is an artesian aquifer throughout much of the county *(11)*. The Surficial Aquifer and Intermediate Aquifer System are also in the county. The Surficial Aquifer consists primarily of quartz sand and includes surficial sand and clay. The top of the Surficial Aquifer is ground water that is virtually unconfined. The Intermediate Aquifer System is in the western part of the county south of Polk City. It is a confined aquifer made up of limestone and clayey sediments. The base of the Intermediate Aquifer System is in direct contact with the Floridan Aquifer.

The major permanent streams and surface drainage systems are the Withlacoochee River, North Prong Alafia River, and the Peace River. The Withlacoochee River drains the northern part of the county, the North Prong Alafia River drains the western part, and the Peace River drains the central part to the Highlands County line. The Kissimmee River drains a large area in the southeastern part of the county. The many branches and creeks are interconnected to complete the drainage of the county.

Transportation Facilities

Polk County is served by several major highways. Interstate 4 crosses the northern part of the county from southwest to northeast. State Highway 60 crosses the central part eastward from the Hillsborough County line to the Kissimmee River. State Highway 37 dissects the middle of the county from Lakeland south to the Manatee County line. U.S. Highway 27 provides multilane transportation in the extreme northeastern part of the county to the Highlands County line. Many interior hard surface and clay roads link the main highway system.

Rail service and many trucking companies are available to move commercial freight. Passenger bus and rail services are also available. Several private and municipal airports are in Polk County.

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; and the kinds of crops and native plants growing on the soils. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material from which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

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

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

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

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

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

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

Map Unit Composition

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

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

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

General Soil Map Units

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

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

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

The boundaries of the general soil map units in Polk County were matched, where possible, with those of the previously completed surveys of Lake, Osceola, and Hardee Counties. In a few places, however, the lines do not join, and the names of the map units differ. These differences resulted mainly because of changes in soil series concepts, differences in map unit design, and changes in soil patterns near the survey area boundaries.

The general soil map units for this survey have been grouped into four general landscapes. Descriptions of each of the broad groups and the map units in each group follow.

Soils of the Uplands

The four map units in this group consist of nearly level to moderately sloping, excessively drained to very poorly drained soils on uplands that generally extend north to south through the central part of the county. Most of the soils are sandy throughout. Some are sandy to a depth of 40 to 79 inches and are underlain by loamy or clayey material.

These soils make up about 27 percent of the county. Most of the acreage is woodland or pastureland; however, most of the citrus in the county is grown on these soils. Low fertility is the main limitation affecting most agricultural uses, and droughtiness is the main hazard. Wetness and rapid and very rapid permeability are the main limitations affecting urban uses.

1. Candler-Tavares-Apopka

Nearly level to moderately sloping, excessively drained, moderately well drained, and well drained, sandy soils; some are underlain by loamy or clayey material

This map unit consists of soils on uplands, mainly the Lakeland, Winter Haven, and Lake Wales Ridges. Slopes range from 0 to 8 percent.

This map unit makes up about 210,000 acres, or 18 percent of the land in the county. It is about 45 percent Candler soils, 19 percent Tavares soils, 9 percent Apopka soils, and 27 percent soils of minor extent.

The Candler soils are excessively drained. These soils, along with the Apopka soils, are in the higher positions on the landscape. The Candler soils are nearly level to moderately sloping. Typically, the surface layer is dark brown sand about 6 inches thick. The subsurface layer to a depth of about 63 inches is brownish yellow sand that grades to yellow. The next layer to a depth of at least 80 inches is yellow sand that has bands of strong brown loamy sand.

The Tavares soils are moderately well drained and are in the lower positions on the landscape. These soils are nearly level to gently sloping. Typically, the surface layer is dark grayish brown fine sand about 8 inches thick. The underlying material to a depth of at least 80 inches is light yellowish brown fine sand that grades to very pale brown.

The Apopka soils are well drained and are nearly level to gently sloping. Typically, the surface layer is very dark gray fine sand about 7 inches thick. The subsurface layer to a depth of about 51 inches is pale brown and very pale brown fine sand. The subsoil is brownish yellow fine sandy loam to a depth of about 61 inches and red sandy clay to a depth of at least 80 inches.

The minor soils are Fort Meade and Kendrick soils in the higher positions on the landscape and Millhopper and Sparr soils in the middle and lower positions. Also included in the very lowest positions on the landscape are small areas of soils that are wetter than the major soils.

About 30 percent of the acreage in this map unit is used for citrus. About 5 percent, mainly in the Lakeland and Winter Haven areas, is used for urban development. The rest is in pasture or natural vegetation. Droughtiness is the main limitation affecting citrus and improved pasture. Limitations affecting most urban uses are minor and easy to overcome. Seepage is a limitation affecting sanitary facilities in some areas. The natural vegetation is mostly turkey oak, longleaf pine, slash pine, and live oak.

2. Astatula-Tavares-Basinger

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

This map unit consists of soils on uplands and in depressions. These soils are on the eastern edge of the Lake Wales Ridge. Slopes range from 0 to 8 percent.

This map unit makes up about 80,000 acres, or 7 percent of the land in the county. It is about 50 percent Astatula soils, 10 percent Tavares soils, 10 percent Basinger soils, and 30 percent soils of minor extent.

The Astatula soils are excessively drained and are in the highest positions on ridges. These soils are nearly level to moderately sloping. Typically, the surface layer is dark gray sand about 7 inches thick. The underlying material is light yellowish brown sand that grades to very pale brown to a depth of at least 80 inches.

The Tavares soils are moderately well drained and are in lower positions on ridges than the Astatula soils. These soils are nearly level to gently sloping. Typically, the surface layer is dark grayish brown fine sand about 8 inches thick. The underlying material is light yellowish brown fine sand that grades to very pale brown to a depth of at least 80 inches.

The Basinger soils are very poorly drained and are in depressions. These soils are nearly level. Typically, the surface layer is very dark gray mucky fine sand about 7 inches thick. The subsurface layer is light gray fine sand to a depth of about 35 inches. The subsoil is a mixture of grayish brown and very dark grayish brown fine sand to a depth of about 45 inches. The underlying material is brown fine sand to at least a depth of 80 inches.

The minor soils are Archbold, Duette, Immokalee, and Pomello soils. Archbold, Duette, and Pomello soils are in positions on the landscape similar to those of the Tavares soils. Immokalee soils are in lower positions.

Most areas of this map unit have been cleared and are used for citrus. Some cleared areas are used for improved pasture. The rest is used as native range, woodland, or wildlife habitat. Droughtiness is the main limitation affecting citrus and improved pasture on the ridges. Citrus and improved pasture should not be planted in the depressions because of ponding.

The natural vegetation on Astatula and Tavares soils is mostly bluejack oak, turkey oak, longleaf pine, and sand pine with an understory of Rosemary, pineland threeawn, chalky bluestem, paspalum, lopsided indiangrass, and panicums. The natural vegetation on Basinger soils is mostly broomsedge bluestem, maidencane, cutgrass, St. Johnswort, pineland threeawn, and other water-tolerant grasses.

3. Archbold-Satellite

Nearly level and gently sloping, moderately well drained and somewhat poorly drained soils that are sandy throughout

This map unit consists of soils on uplands and low knolls, mainly on either side of the Lake Wales Ridge. Slopes range from 0 to 5 percent.

This map unit makes up about 17,000 acres, or slightly over 1 percent of the land in the county. It is about 45 percent Archbold soils, 18 percent Satellite soils, and 37 percent soils of minor extent.

The Archbold soils are moderately well drained and are in the highest positions on the landscape. These soils are nearly level and gently sloping. Typically, the surface layer is gray sand about 4 inches thick. The underlying material is white sand to a depth of at least 80 inches.

The Satellite soils are somewhat poorly drained and are in slightly lower positions on the landscape. These soils are nearly level. Typically, the surface layer is very dark gray sand about 6 inches thick. The underlying material is gray sand that grades to grayish brown to a depth of at least 80 inches.

The minor soils are Pomello and Duette soils in about the same landscape positions as those of the Archbold and Satellite soils and Immokalee, Myakka, and Pompano soils in lower positions.

About 2 percent of the acreage of this map unit is used for citrus. A small acreage is in urban development, and the rest is in pasture or natural vegetation. Droughtiness and seasonal wetness are limitations affecting citrus. Droughtiness is the main limitation affecting improved pasture. Limitations affecting most urban uses are minor and easy to overcome; however, seepage and the seasonal wetness are limitations affecting sanitary facilities. The natural vegetation is mostly sand pine, sand live oak, slash pine, saw palmetto, pricklypear, and pineland threeawn.

4. Zolfo-Tavares

Nearly level and gently sloping, somewhat poorly drained and moderately well drained soils that are sandy throughout

This map unit consists of soils on uplands at a lower elevation than the main ridges of the county. The major areas of this map unit are south of Ft. Meade on the uplands adjacent to the Peace River. Small areas are near Sunray and in the western part of the county near Willow Oak. Slopes range from 0 to 5 percent.

This map unit makes up about 14,500 acres, or slightly over 1 percent of the land in the county. It is about 60 percent Zolfo soils, 20 percent Tavares soils, and 20 percent soils of minor extent.

The Zolfo soils are somewhat poorly drained and are in the slightly lower positions on the landscape. These soils are nearly level. Typically, the surface layer is very dark gray fine sand about 7 inches thick. The subsurface layer is brown or pale brown fine sand to a depth of about 30 inches, light gray fine sand to a depth of about 67 inches, and brown fine sand to a depth of about 71 inches. The subsoil to a depth of at least 80 inches is dark reddish brown fine sand that is coated with organic matter.

The Tavares soils are moderately well drained and are in the higher positions on the landscape. These soils are nearly level and gently sloping. Typically, the surface layer is dark grayish brown fine sand about 8 inches thick. The underlying material is light yellowish brown fine sand that grades to very pale brown to a depth of at least 80 inches.

The minor soils are Adamsville, Millhopper, Myakka, and Sparr soils. Adamsville and Sparr soils are in the same landscape position as that of the Zolfo soils. Millhopper soils are in the same landscape position as that of the Tavares soils. Myakka soils are poorly drained and are in the lowest positions.

About 20 percent of the acreage of this map unit is used for citrus. Some areas are used for pasture or truck crops, and small areas remain in natural vegetation. Droughtiness is the main limitation affecting most uses. Seasonal wetness affects citrus production in some areas, but it is easily overcome by bedding. The natural vegetation is mostly turkey oak, laurel oak, longleaf pine, slash pine, and saw palmetto with an understory of pineland threeawn, bluestem, and lopsided indiangrass.

Soils of the Flatwoods

The five map units in this group consist mostly of nearly level, somewhat poorly drained and very poorly drained soils on flatwoods scattered throughout the county. Some of the soils are sandy throughout, and others have sandy surface and subsurface layers and a sandy and loamy subsoil.

These soils make up about 47 percent of the county. Most of the acreage is rangeland, pastureland, or woodland. Wetness is the main limitation affecting most agricultural and urban uses.

5. Pomona-Myakka-Smyrna

Nearly level, poorly drained, sandy soils; some are underlain by loamy material

This map unit consists of soils on pine and saw palmetto flatwoods interspersed with wet depressions, swamps, and poorly defined drainageways (fig. 3). Large areas of this map unit are in the northern part of the county in the Green Swamp and west of the Lakeland Ridge. Smaller areas are scattered throughout the county. Slopes are 0 to 2 percent.

This map unit makes up about 185,000 acres, or about 16 percent of the land in the county. It is about 46 percent Pomona soils, 11 percent Myakka soils, 9 percent Smyrna soils, and 34 percent soils of minor extent.

Typically, the Pomona soils have a very dark gray fine sand surface layer about 6 inches thick. The subsurface layer to a depth of about 21 inches is sand. It is light brownish gray in the upper part and light gray in the lower part. The subsoil is dark reddish brown loamy fine sand to a depth of about 26 inches. Below that is very pale brown and light gray fine sand to a depth of about 48 inches and light gray fine sandy loam that grades to sandy clay loam to a depth of about 73 inches. The underlying material is light gray loamy sand to a depth of at least 80 inches.

Typically, the Myakka soils have a very dark gray fine sand surface layer about 7 inches thick. The subsurface layer is gray fine sand to a depth of about 25 inches. The subsoil to a depth of about 36 inches is fine sand. It is black in the upper part and dark brown in the lower part. The underlying material is yellowish

Figure 3.—Pine and saw palmetto flatwoods are typical of most areas of the Pomona-Myakka-Smyrna general soil map unit.

brown fine sand to a depth of at least 80 inches.

Typically, the Smyrna soils have a black fine sand surface layer about 4 inches thick. The subsurface layer is gray fine sand to a depth of about 12 inches. The subsoil is dark brown and brown fine sand to a depth of about 25 inches. Below that is very pale brown fine sand to a depth of about 42 inches and very dark brown fine sand to a depth of about 48 inches. The underlying material is brown and light brownish gray fine sand to a depth of at least 80 inches.

The minor soils are Basinger, Eaton, Felda, Floridana, Holopaw, Hontoon, Lynn, Ona, Samsula, Kaliga, and Wauchula soils. Ona, Lynn, and Wauchula soils are in landscape positions similar to those of the Pomona, Myakka, and Smyrna soils. The other soils are in depressional areas. Also included are some better drained soils on small, low knolls.

Most areas of this map unit are used as native range, or they are cleared for improved pasture. Small areas are used for vegetable crops and pine trees. Wetness is the main limitation affecting agricultural uses. Except in areas used as native range, drainage or water control is needed for best results. The natural vegetation is mostly South Florida slash pine, longleaf pine, slash pine, saw palmetto, water oak, running oak, gallberry, waxmyrtle, ground blueberry, pineland threeawn, and scattered fetterbush lyonia. Bay, cypress, maple, and gum trees with a ground cover of sawgrass, fern, greenbrier, lilies, reeds, and other aquatic plants are dominant in most depressional areas. Some depressional areas have few trees. They support mainly maidencane, arrowhead, pickerelweed, and bulrush.

6. Smyrna-Myakka-Immokalee

Nearly level, poorly drained soils that are sandy throughout

This map unit consists of soils on pine and saw palmetto flatwoods interspersed with wet depressions and poorly defined drainageways. Areas of this map unit are scattered throughout the central and eastern parts of the county on either side of the Lake Wales Ridge. Slopes are 0 to 2 percent.

This map unit makes up about 252,000 acres, or about 22 percent of the land in the county. It is about 29 percent Smyrna soils, 18 percent Myakka soils, 10 percent Immokalee soils, and 43 percent soils of minor extent.

Typically, the Smyrna soils have a black fine sand surface layer about 4 inches thick. The subsurface layer is gray fine sand to a depth of about 12 inches. The subsoil is dark brown and brown fine sand to a depth of about 25 inches. Below this is very pale brown fine sand to a depth of about 42 inches and very dark brown fine sand to a depth of about 48 inches. The underlying material is brown and light brownish gray fine sand to a depth of at least 80 inches.

Typically, the Myakka soils have a very dark gray fine sand surface layer about 7 inches thick. The subsurface layer is gray fine sand to a depth of about 20 inches. The subsoil to a depth of about 36 inches is fine sand. It is black in the upper part and dark brown in the lower part. The underlying material is yellowish brown fine sand to a depth of at least 80 inches.

Typically, the Immokalee soils have a very dark gray sand surface layer about 7 inches thick. The subsurface layer to a depth of about 39 inches is light gray sand that grades to white. The subsoil is black sand to a depth of about 58 inches. Below that is gray sand to a depth of about 66 inches, very dark gray sand to a depth of about 75 inches, and black sand to a depth of at least 80 inches.

The minor soils are Adamsville, Basinger, Narcoossee, Ona, Placid, Satellite, and St. Johns soils. Basinger, Ona, and St. Johns soils are in landscape positions similar to those of the Smyrna, Myakka, and Immokalee soils. Placid soils are in depressional areas. Adamsville, Narcoossee, and Satellite soils are in the slightly higher positions.

Most areas of this map unit are used as native range, or they are cleared for improved pasture. Small areas are used for pine trees. Wetness is the main limitation affecting improved pasture and pine trees, but it is easily controlled by surface drainage, bedding, or both. The natural vegetation is mostly South Florida slash pine, slash pine, longleaf pine, saw palmetto, live oak, water oak, running oak, gallberry, waxmyrtle, pineland threeawn, and scattered fetterbush lyonia.

7. Pompano-Satellite-Immokalee

Nearly level, poorly drained and somewhat poorly drained soils that are sandy throughout

This map unit consists of soils on pine and saw palmetto flatwoods interspersed with low knolls, wet depressions, and poorly defined drainageways. Areas of this map unit are east of the Lake Wales Ridge from the Lake County line to the Highlands County line. Slopes are 0 to 2 percent.

This map unit makes up about 18,000 acres, or less than 2 percent of the land in the county. It is about 48 percent Pompano soils, 15 percent Satellite soils, 12 percent Immokalee soils, and 25 percent soils of minor extent.

The Pompano soils are poorly drained. Typically, the surface layer is fine sand about 15 inches thick. It is dark gray in the upper part and grayish brown in the lower part. The underlying material to a depth of at least 80 inches is very pale brown fine sand that grades to light gray.

The Satellite soils are somewhat poorly drained and are in slightly higher positions on the landscape than the Pompano and Immokalee soils. Typically, the surface layer is very dark gray sand about 6 inches thick. The underlying material is gray sand that grades to grayish brown to a depth of at least 80 inches.

The Immokalee soils are poorly drained and are in positions on the landscape similar to those of the Pompano soils. Typically, the surface layer is very dark gray sand about 7 inches thick. The subsurface layer is light gray sand that grades to white to a depth of about 39 inches. The subsoil is black sand to a depth of about 58 inches. Below that is gray sand to a depth of about 66 inches, very dark gray sand to a depth of about 75 inches, and black sand to a depth of at least 80 inches.

The minor soils are Archbold, Basinger, Hontoon, Myakka, Placid, and Samsula soils. Archbold soils are better drained and are in slightly higher positions on the landscape than the Satellite soils. Basinger and Myakka soils are in positions similar to those of the Pompano and Immokalee soils. Hontoon, Placid, and Samsula soils are in depressional areas.

Most areas of this map unit are used as native range, or they are cleared for improved pasture. Other areas are woodland. Some small areas are in pine trees or citrus. Wetness is the main limitation affecting agricultural uses. Except in areas used as native range, surface drainage or bedding is needed. Major water control, including high beds, is needed for citrus.

The natural vegetation is mostly South Florida slash pine, slash pine, longleaf pine, saw palmetto, running oak, gallberry, waxmyrtle, pineland threeawn, and scattered fetterbush lyonia. Sand live oak and sand pine are on sites at slightly higher elevations.

8. EauGallie-Bradenton-Floridana

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

This map unit consists of soils on cabbage palm, pine, and saw palmetto flatwoods interspersed with wet depressions, swamps, and drainageways. Most areas of this map unit are in the northwestern part of the county adjacent to the Withlacoochee River and along streams leading into the river. Smaller areas are in the northeastern part of the county along parts of Reedy Creek Swamp. Slopes are 0 to 2 percent.

This map unit makes up about 31,000 acres, or about 3 percent of the land in the county. It is about 25 percent EauGallie and Wabasso soils, 18 percent Bradenton soils, 15 percent Floridana soils, and 42 percent soils of minor extent. Wabasso soils are similar to the EauGallie soils.

EauGallie soils are poorly drained. Typically, the surface layer is black fine sand about 6 inches thick. The subsurface layer is gray fine sand that grades to light gray to a depth of about 26 inches. The subsoil is black fine sand to a depth of about 32 inches, dark brown fine sand to a depth of about 52 inches, and gray sandy clay loam to a depth of at least 80 inches.

Bradenton soils are poorly drained. Typically, the surface layer is black fine sand about 4 inches thick. The subsurface layer is dark grayish brown fine sand to a depth of about 12 inches. The subsoil is dark gray sandy loam to a depth of about 16 inches and gray sandy clay loam to a depth of about 22 inches. The underlying material is white sandy loam to a depth of 60 inches and light gray loamy sand to a depth of at least 80 inches.

Floridana soils are in depressions and are very poorly drained. Typically, the surface layer is about 15 inches thick. It is black mucky fine sand that grades to fine sand. The subsurface layer to a depth of about 28 inches is gray fine sand that grades to grayish brown. The subsoil to a depth of about 58 inches is grayish brown sandy clay loam that grades to gray. It is greenish gray sandy loam to a depth of at least 80 inches.

The minor soils are Chobee, Felda, Holopaw, Malabar, Oldsmar, and Paisley soils. Also included in areas on small knolls are some of the better drained soils in the county. Chobee, Felda, and Holopaw soils are in landscape positions similar to those of the Floridana soils, and they are subject to flooding. Malabar, Oldsmar, and Paisley soils are in landscape positions similar to those of the EauGallie and Bradenton soils.

Most areas of this map unit are used as native range, or they are cleared for improved pasture. Some areas are used for timber. Wetness is the main limitation. Surface drainage or bedding is needed for improved pasture and pine trees.

The natural vegetation on flatwoods is mostly cabbage palm, slash pine, saw palmetto, waxmyrtle, gallberry, and pineland threeawn. Some areas adjacent to the rivers and streams are hardwood hammocks with a variety of oak, cabbage palm, and magnolia. The natural vegetation in depressional areas is mostly cypress, bay, maple, and gum trees with a ground cover of sawgrass, fern, greenbrier, lilies, reeds, and other aquatic plants. Some depressional areas have few trees. They support mainly maidencane, arrowhead, pickerelweed, and bulrush.

9. Malabar-EauGallie-Valkaria

Nearly level, poorly drained, sandy soils; some are underlain by loamy material

This map unit consists of soils on cabbage palm, slash pine, and saw palmetto flatwoods interspersed with wet depressions, swamps, and poorly defined drainageways. Most areas of this map unit are in the southeastern part of the county. Slopes are 0 to 2 percent.

This map unit makes up about 45,000 acres, or about 4 percent of the land in the county. It is about 25 percent Malabar soils, 20 percent EauGallie and Wabasso soils, 12 percent Valkaria soils, and 43 percent soils of minor extent. Wabasso soils are similar to the EauGallie soils.

Typically, the Malabar soils have a black fine sand surface layer about 5 inches thick. The subsurface layer is grayish brown to light brownish gray fine sand to a depth of about 22 inches. The subsoil is brownish yellow fine sand to a depth of about 30 inches and yellow fine sand to a depth of about 38 inches. Below that is light brownish gray fine sand to a depth of about 48 inches and gray sandy loam and sandy clay loam to a depth of at least 80 inches.

Typically, the EauGallie soils have a black fine sand surface layer about 6 inches thick. The subsurface layer to a depth of about 26 inches is gray fine sand that grades to light gray. The subsoil is black fine sand to a depth of about 32 inches, dark brown fine sand to a depth of about 52 inches, and gray sandy clay loam to a depth of at least 80 inches.

Typically, the Valkaria soils have a black sand surface layer about 5 inches thick. The subsurface layer is light gray sand to a depth of about 26 inches. The subsoil is yellowish brown sand to a depth of about 32 inches and very pale brown sand to a depth of about 46 inches. The underlying material is light gray and white sand to a depth of least 80 inches.

The minor soils are Basinger, Felda, Floridana, Myakka, Oldsmar, and Placid soils. Basinger, Myakka, and Oldsmar soils are in landscape positions similar to those of the major soils. Felda, Floridana, Placid, and Myakka soils are in depressions and are very poorly drained.

Most areas of this map unit are used as native range, or they are cleared for improved pasture. Some areas are used for pine trees. Wetness is the main limitation. Except in areas used as native range, surface drainage or bedding is needed for best results. The natural vegetation is mostly cabbage palm, scattered slash pine, saw palmetto, waxmyrtle, gallberry, switchgrass, and pineland threeawn.

Soils of the Marshes, Swamps, and Flood Plains

The three map units in this group consist of nearly level, poorly drained and very poorly drained, mineral and organic soils that are subject to flooding or ponding. These soils are near rivers, streams, lakes, and other low-lying areas.

These soils make up about 13 percent of the county. Most areas are in natural vegetation and provide habitat for wildlife. A few areas are used for improved pasture. Wetness is the main limitation affecting most agricultural uses.

10. Samsula-Hontoon

Nearly level, very poorly drained, organic soils; some are underlain by sand

This map unit consists of soils in swamps, marshes, and drainageways. A large area of this map unit is in the northern part of the county, north of Lake Alfred and west of Highway 27. Many smaller areas are scattered throughout the county. Slopes are 0 to 2 percent.

This map unit makes up about 128,000 acres, or about 11 percent of the land in the county. It is about 40 percent Samsula soils, 38 percent Hontoon soils, and 22 percent soils of minor extent.

Typically, the Samsula soils are black to dark reddish brown muck to a depth of about 31 inches. The underlying material is black to dark grayish brown sand to a depth of at least 80 inches.

Typically, the Hontoon soils are black and dark brown muck to a depth of about 75 inches. The underlying material to a depth of at least 80 inches is black sandy loam.

The minor soils are Myakka and Pomona soils in the slightly higher positions on the landscape and Floridana, Placid, and Kaliga soils in positions similar to those of the major soils.

Most areas of this map unit are in natural vegetation. Some drained areas are used as pastureland. The natural vegetation is mostly bay, cypress, maple, gum, and pine trees with a ground cover of sawgrass, greenbrier, fern, lilies, reeds, and other aquatic plants. Some areas have few trees. They support mainly maidencane, arrowhead, pickerelweed, and bulrush.

11. Nittaw-Kaliga-Chobee

Nearly level, very poorly drained, loamy and mucky soils that are subject to flooding

This map unit consists of soils in swamps, depressions, and on flood plains adjacent to some of the major rivers and streams throughout the county. Slopes are 0 to 2 percent.

This map unit makes up about 16,000 acres, or slightly more than 1 percent of the county. It is about 45 percent Nittaw soils, 25 percent Kaliga soils, 10 percent Chobee soils, and 20 percent soils of minor extent.

Typically, the Nittaw soils have a black sandy clay loam surface layer about 6 inches thick. The subsoil extends to a depth of about 75 inches. The upper part is very dark gray sandy clay, and the lower part is gray clay that grades to dark gray sandy clay loam. The underlying material is gray loamy sand to a depth of at least 80 inches.

Typically, the Kaliga soils have a surface layer that extends to a depth of about 30 inches. It is black muck that grades to dark reddish brown muck. The underlying material is very dark gray loam to a depth of about 55 inches, dark gray sandy loam to a depth of about 75 inches, and light gray sand to a depth of at least 80 inches.

Typically, the Chobee soils have a black fine sandy loam surface layer about 12 inches thick. The upper part of the subsoil to a depth of 32 inches is gray sandy clay loam that grades to grayish brown. The lower part is gray sandy loam to a depth of about 55 inches. The underlying material is light brownish gray fine sand to a depth of at least 80 inches.

The minor soils are Anclote, Basinger, Bradenton, Felda, Floridana, Samsula, St. Augustine, and Winder soils. Basinger and Felda soils are occasionally flooded and are in slightly higher positions on the landscape than the major soils. Anclote, Floridana, Samsula, and Winder soils are in positions similar to those of the major soils. St. Augustine soils are on long, narrow, manmade ridges that resulted from dredging the Kissimmee River.

Most areas of this map unit are in natural vegetation and provide good habitat for wildlife. Some areas are used as native range, and others have been cleared and drained for use as improved pasture.

The natural vegetation is mostly cypress, red maple, sweetgum, ironweed, and bay trees with an understory of waxmyrtle, greenbrier, cabbage palm, and shade- and water-tolerant forbs and grasses. Some areas have few trees. They support maidencane, pickerelweed, lilies, and sawgrass.

12. Bradenton-Felda-Chobee

Nearly level, poorly drained and very poorly drained, sandy and loamy soils that are subject to frequent flooding

This map unit consists of soils on flood plains along the Peace River south of Ft. Meade and along the Bowlegs Creek that feeds into the Peace River. Slopes are 0 to 2 percent.

This map unit makes up about 5,400 acres, or less than 1 percent of the land in the county. It is about 37 percent Bradenton soils, 30 percent Felda soils, 20 percent Chobee soils, and 13 percent soils of minor extent.

Bradenton soils are poorly drained. Typically, the surface layer is very dark gray fine sand about 6 inches thick. The subsurface layer is grayish brown fine sand to a depth of about 12 inches. The subsoil is dark grayish brown sandy loam to a depth of about 21 inches. The underlying material is gray or light gray sandy loam to a depth of about 58 inches and gray fine sand or loamy sand to a depth of at least 80 inches.

Felda soils are poorly drained. Typically, the surface layer is very dark gray fine sand about 3 inches thick. The subsurface layer is light brownish gray fine sand to a depth of about 22 inches. The subsoil is gray sandy loam to a depth of about 35 inches and light gray loamy sand to a depth of about 45 inches. The underlying material is greenish gray loamy sand to a depth of at least 80 inches.

Chobee soils are very poorly drained. Typically, the surface layer is black fine sandy loam about 12 inches thick. The subsoil is gray and grayish brown sandy clay loam to a depth of about 32 inches and gray sandy loam to a depth of about 55 inches. The underlying material is light brownish gray fine sand to a depth of at least 80 inches.

The minor soils are Floridana, Holopaw, and Pompano soils. Also of minor extent are small areas of organic soils in the lowest positions on the landscape.

Almost all areas of this map unit are in natural vegetation. A few areas are drained and used as improved pasture. The natural vegetation is mostly sweetgum, oak, bay, cypress, red maple, cabbage palm, and saw palmetto.

Soils of Mined Areas

This map unit consists of soils remaining after phosphate or silica sand has been mined (fig. 4). Texture, slope, and drainage are variable. Most areas of these soils are in the southwestern part of the county.

13. Arents-Hydraquents-Neilhurst

Soils that have been strip mined for phosphate or silica sand

Most areas of these soils are in the southwestern part of the county. Others are northeast, east, and south of Lakeland. Small areas are east of Lake Wales along Highway 60 and north of Davenport along Highway 17/92.

This map unit makes up about 164,000 acres, or about 13 percent of the land in the county. It is about 45 percent Arents and Arents-Water complex, 30 percent Hydraquents, 14 percent Neilhurst soils, and 11 percent soils of minor extent.

The Arents are moderately well drained to excessively drained. These soils consist of piles of soil material or overburden that originally overlaid the phosphate-bearing strata. Some of these soils remain as a series of pits paralleled by long, steep mounds of soil material. Water often collects in the pits after the mining process is complete. Some areas are leveled or reclaimed to create usable agricultural land. These soils are quite variable because of the mixing and moving by

Figure 4.—Manmade ponds are part of this reclaimed area of Arents, 0 to 5 percent slopes.

earth-moving machinery. Typically, they are a mixture of sandy and clayey material ranging in depth from 30 to at least 80 inches.

The Hydraquents are a by-product of the phosphate mining process. Typically, they are 85 percent clay, 10 percent silt, and 5 percent sand. The material generally is gray and light gray and has some yellowish brown mottles. The soils range in depth from a few feet to more than 20 feet. They are locally called "slickens."

Neilhurst soils are excessively drained. These soils are a by-product of either the phosphate mining or silica mining processes. The color and thickness of these soils vary from one area to another. Typically, these soils have a grayish brown sand surface layer about 3 inches thick. The underlying material is light gray sand mixed with reddish brown and brown sand to a depth of at least 80 inches.

Of minor extent in this map unit are Gypsum land, Arents that have a clayey substratum, Haplaquents, and small areas of naturally occurring soils. Gypsum land and Arents are similar to the major soils in that they are also the result of phosphate mining and fertilizer production processes. The naturally occurring soils are very poorly drained to excessively drained.

Some of the reclaimed areas are used for improved pasture or pine trees. Experimental work is being done to determine the feasibility of using these areas for citrus and vegetables. Some areas that have not been reclaimed provide excellent habitat for wildlife and sites for recreational activities.

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, Candler sand, 0 to 5 percent slopes, is a phase of the Candler series.

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

A *soil complex* consists of two or more soils in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Adamsville-Urban land complex is an example.

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

An *undifferentiated group* is made up of two or more soils that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils in a mapped area are not uniform. An area can be made up of only one of the major soils, or it can be made up of all of them. Smyrna and Myakka fine sands is an undifferentiated group in this survey area.

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

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Gypsum land 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.

2—Apopka fine sand, 0 to 5 percent slopes. This well drained soil is on uplands and knolls on flatwoods. Areas of this soil range from about 10 to 160 acres. Slopes are smooth to convex.

Typically, this soil has a very dark gray fine sand surface layer about 7 inches thick. The subsurface layer to a depth of about 51 inches is pale brown and very pale brown fine sand. The subsoil to a depth of about 61 inches is brownish yellow fine sandy loam that has red mottles. It is red sandy clay to a depth of at least 80 inches.

Included with this soil in mapping are small areas of Candler, Fort Meade, Millhopper, and Tavares soils. Candler, Fort Meade, and Tavares soils do not have a loamy subsoil. Millhopper soils are similar to the Apopka soil. The included soils make up about 5 to 20 percent of the map unit.

This Apopka soil does not have a high water table within a depth of 80 inches. The available water capacity is low. Permeability is moderate.

Most areas of this soil are used for citrus. Some remain in natural vegetation that is mostly turkey oak, slash pine, longleaf pine, bluejack oak, post oak, and live oak. The understory includes pineland threeawn and running oak.

Droughtiness and rapid leaching of plant nutrients are severe limitations affecting cultivated crops. If this soil is cultivated, row crops should be planted on the contour. Crop rotations should keep close-growing cover crops on the land at least two-thirds of the time. Soil-improving cover crops and crop residue protect the soil from erosion. Conservation tillage conserves moisture and helps to control erosion. Irrigation of high value crops generally is feasible where water is readily available.

This soil is well suited to citrus. Good yields of oranges and grapefruit generally can be obtained without irrigation. Increased yields make irrigation feasible where water is readily available.

This soil is well suited to pastures of coastal bermudagrass and bahiagrass, but yields are reduced by periodic droughts. Grazing should be controlled to maintain plant vigor and good ground cover. Fertilizer and lime should be added according to the need of the plants.

Typically, the Longleaf Pine-Turkey Oak Hills range site includes areas of this soil. The dominant vegetation is longleaf pine and turkey oak. Forage production and quality are poor, and cattle do not readily use this range site if other sites are available. Desirable forage includes creeping bluestem, lopsided indiangrass, and low panicums.

The potential productivity for pine trees is moderately high. The major concerns in management, caused by droughtiness and sandiness, are the equipment use limitation and seedling mortality. Slash pine, South Florida slash pine, and longleaf pine are the best trees to plant.

This soil has only slight limitations affecting most urban uses; however, seepage is a severe limitation affecting sewage lagoons and landfill areas. The sidewalls of lagoons and landfills should be sealed.

The sandy surface causes poor trafficability in recreational areas. The addition of suitable topsoil or some form of surfacing can reduce or overcome this limitation.

The capability subclass is IIIs.

3—Candler sand, 0 to 5 percent slopes. This excessively drained soil is on uplands and knolls on flatwoods. Areas of this soil range from about 30 to several hundred acres. Slopes are smooth to concave.

Typically, this soil has a dark brown sand surface layer about 6 inches thick. The subsurface layer to a depth of about 63 inches is brownish yellow sand that grades to yellow. The next layer to a depth of at least 80 inches is yellow sand that has very thin, strong brown lamellae.

Included with this soil in mapping are small areas of Apopka, Astatula, Millhopper, and Tavares soils. Apopka and Millhopper soils have a loamy subsoil. Astatula and Tavares soils are similar to the Candler soil. The included soils make up 15 to 20 percent of the map unit.

This Candler soil does not have a high water table within a depth of 80 inches. The available water capacity is low or very low, and permeability is rapid.

Most areas of this soil are in citrus. Some remain in natural vegetation that is mostly turkey oak, post oak, live oak, South Florida slash pine, and other pines and a sparse understory of indiangrass, pineland threeawn, hairy panicum, and annual forbs.

The sandy texture and droughtiness of this soil are very severe limitations affecting cultivated crops. Intensive soil management practices are required. The droughtiness and rapid leaching of plant nutrients reduce the variety and potential yields of crops. Crop rotations should keep close-growing crops on the land at least three-fourths of the time. Soil-improving crops and crop residue help to control soil blowing and to maintain organic matter content. Only a few crops produce good yields without irrigation. Irrigation generally is feasible where water is readily available.

In places that are relatively free from freezing temperatures, this soil is suited to citrus. A ground cover of close-growing plants is needed between the trees to control soil blowing. Good yields can be obtained in some years without irrigation, but a well designed irrigation system, which maintains optimum moisture conditions, is needed to ensure best yields.

This soil is moderately suited to improved pasture. Deep rooted plants, such as coastal bermudagrass and bahiagrass, are best suited, but yields are reduced by periodic droughtiness. Fertilizer and lime are needed on a regular basis. Grazing should be controlled to maintain plant vigor.

Typically, the Longleaf Pine-Turkey Oak Hills range site includes areas of this soil. The dominant vegetation is longleaf pine and turkey oak. Forage production and quality are poor, and cattle do not readily use this range site if other sites are available. Desirable forage includes creeping bluestem, lopsided indiangrass, and low panicums.

The potential productivity of pine trees is moderate. The major concerns in management, caused by the sandiness of the soil, are seedling mortality and the equipment use limitation. Sand pine, slash pine, South Florida slash pine, and longleaf pine are the best trees to plant.

This soil has only slight limitations affecting most urban uses. Because of poor filtration, however, ground water contamination is a hazard in areas where there is a concentration of homes with septic tanks. Seepage is a severe limitation affecting sanitary landfills, and trenches should be sealed.

The sandy surface causes poor trafficability in recreational areas. The addition of suitable topsoil or some form of surfacing can reduce or overcome this limitation.

The capability subclass is IVs.

4—Candler sand, 5 to 8 percent slopes. This excessively drained soil is on side slopes on uplands. Areas of this soil range from about 15 to 60 acres. Slopes are smooth to concave.

Typically, this soil has a dark brown sand surface layer about 7 inches thick. The subsurface layer to a depth of about 63 inches is brownish yellow sand that grades to yellow. The next layer to a depth of at least 80 inches is yellow fine sand that has very thin, strong brown lamellae.

Included with this soil in mapping are small areas of Apopka, Astatula, Millhopper, and Tavares soils. Apopka and Millhopper soils have a loamy subsoil. Astatula and Tavares soils are similar to the Candler soil. The included soils make up 15 to 20 percent of the map unit.

This Candler soil does not have a high water table within a depth of 80 inches. The available water capacity is low or very low, and permeability is rapid.

Most areas of this soil are in citrus. Some remain in natural vegetation that is mostly South Florida slash pine, other pines, live oak, turkey oak, and post oak with an understory of indiangrass, pineland threeawn, hairy panicum, and annual forbs.

This soil is not suited to most cultivated crops because of droughtiness, rapid leaching of plant nutrients, and the slope.

In places that are relatively free from freezing temperatures, this soil is suited to citrus. Good yields of fruit can be obtained in some years without irrigation, but for best yields, irrigation should always be used where water is available. Management practices that minimize the hazard of erosion should be used.

This soil is moderately suited to pasture grasses, such as coastal bermudagrass and bahiagrass. It is not suited to clover. Yields are reduced by periodic drought. Fertilizer should be applied on a regular basis. Grazing should be controlled to maintain highest yields and good ground cover.

Typically, the Longleaf Pine-Turkey Oak Hills range site includes areas of this soil. The dominant vegetation is longleaf pine and turkey oak. Forage production and quality are poor, and cattle do not readily use this range site if other sites are available. Desirable forage includes creeping bluestem, lopsided indiangrass, and low panicums.

The potential productivity for pine trees is moderate. Seedling mortality and the equipment use limitation are the major concerns in management. Sand pine, slash pine, South Florida slash pine, and longleaf pine are the best trees to plant.

This soil has only slight limitations affecting most urban uses. Because of poor filtration, however, ground water contamination is a hazard in areas where there is a concentration of homes with septic tanks. Seepage is a severe limitation affecting sanitary landfills, and trenches should be sealed. Slope is a moderate limitation affecting sites for small commercial buildings.

The sandy surface causes poor trafficability in recreational areas. The addition of suitable topsoil or some form of surfacing can reduce or overcome this limitation. Slope is a severe limitation affecting playgrounds.

The capability subclass is VIs.

5—EauGallie fine sand. This poorly drained soil is on flatwoods. Areas of this soil range from about 30 to several hundred acres. Slopes are smooth to concave and are 0 to 2 percent.

Typically, this soil has a black fine sand surface layer about 6 inches thick. The subsurface layer to a depth of about 26 inches is gray fine sand that grades to light gray. The subsoil is black fine sand to a depth of about 32 inches, dark brown fine sand to a depth of about 52 inches, and gray sandy clay loam to a depth of at least 80 inches. In some areas, the subsoil is underlain by sandy material, and in others, fragments of shell or limestone are in the subsoil and underlying material.

Included with this soil in mapping are small areas of Felda, Malabar, Pomona, and Wabasso soils. Felda and Malabar soils do not have a black subsoil. Pomona and Wabasso soils are similar to the EauGallie soil. The included soils make up about 15 to 25 percent of the map unit.

This EauGallie soil has a high water table within 12 inches of the surface for 1 to 4 months during most years. The available water capacity is low. Permeability is moderately slow in the lower part of the subsoil.

Most of the acreage of this soil is in pasture. The natural vegetation is longleaf pine, South Florida slash pine, slash pine, cabbage palm, saw palmetto, gallberry, and switchgrass.

This soil has severe limitations affecting most cultivated crops. Wetness and low natural fertility limit the choice of plants and reduce potential yields. If intensive management practices and a water-control system are used, some vegetables can be grown. The water-control system must remove excess water in wet periods. Irrigation is necessary in some areas for best plant growth during dry periods. Crop residue and soil-improving cover crops add organic matter to the soil and improve fertility. Fertilizer should be applied according to the needs of the crop.

This soil is moderately suited to pasture and hay crops; however, a good water-control system is needed to remove excess water. Pangolagrass and bahiagrass are suitable pasture plants. Grasses respond to regular applications of fertilizer. Grazing should be controlled to maintain plant vigor and a good ground cover.

Typically, the South Florida Flatwoods range site includes areas of this soil. The dominant vegetation is scattered pine trees with an understory of saw palmetto and grass. If good grazing management practices are used, this range site has the potential to produce significant amounts of creeping bluestem, lopsided indiangrass, chalky bluestem, and various panicums. If range deterioration occurs, saw palmetto and pineland threeawn are dominant.

The potential productivity for pine trees is moderately high. The equipment use limitation during periods of heavy rainfall, seedling mortality, and plant competition are concerns in management. Slash pine and South Florida slash pine are the best trees to plant.

This soil has severe limitations affecting such urban uses as septic tank absorption fields, dwellings, and local roads and streets. Special measures are required to overcome excessive wetness. Septic tank absorption fields should be elevated by adding fill. Building foundations and roadbeds require special measures to provide additional strength.

Excessive wetness and the sandy texture are severe limitations affecting recreational uses. A water-control system that keeps the seasonal high water table below a depth of about 2.5 feet is required. Suitable topsoil or pavement can be used to stabilize the surface in heavy traffic areas.

The capability subclass is IVw.

6—Eaton mucky fine sand, depressional. This very poorly drained soil is in wet depressions on flatwoods. Areas of this soil range from 3 to 100 acres. Slopes are concave and are 0 to 2 percent.

Typically, this soil has a black mucky fine sand surface layer about 6 inches thick. The subsurface layer is light gray fine sand to a depth of about 29 inches. The gray subsoil is sandy clay loam to a depth of about 33 inches and sandy clay to a depth of at least 80 inches.

Included with this soil in mapping are small areas of Chobee, Felda, Floridana, Holopaw, Kaliga, and Winder soils. Chobee and Winder soils are loamy within a depth of 20 inches. Kaliga soils are organic. Felda, Floridana, and Holopaw soils are similar to the Eaton soil. The included soils make up about 15 to 30 percent of the map unit.

The Eaton soil is ponded for 6 months or more each year. The available water capacity is moderate. Permeability is slow in the subsoil.

The natural vegetation is mostly pondcypress, waxmyrtle, gallberry, and other water-tolerant trees, forbs, and grasses.

This soil is not suited to cultivated crops, citrus, improved pasture, or pine trees because of the ponding. Drainage is needed, but drainage outlets are normally hard to establish.

Typically, the Freshwater Marshes and Ponds range site includes areas of this soil. The dominant vegetation is an open expanse of grasses, sedges, rushes, and other herbaceous plants in areas where the soil generally is saturated or covered with water for at least 2 months during the year. If good grazing management practices are used, this range site has the potential to produce more forage than any of the other range sites. Chalky bluestem and blue maidencane dominate the drier parts of the site, and maidencane is dominant in the wetter parts. Other desirable forage includes cutgrass, bluejoint panicum, sloughgrass, and low panicums. Periodic high water levels provide a much needed natural deferment from overgrazing. If excessive grazing occurs, common carpetgrass, an introduced plant, tends to dominate the drier parts of the site.

This soil is severely limited as a site for most urban uses because of the ponding.

The capability subclass is VIIw.

7—Pomona fine sand. This poorly drained soil is in broad areas on flatwoods. Areas of this soil range from 5 to several hundred acres. Slopes are smooth to concave and are 0 to 2 percent.

Typically, this soil has a very dark gray fine sand surface layer about 6 inches thick. The subsurface layer to a depth of about 21 inches is sand. It is light brownish gray in the upper part and light gray in the lower part. The subsoil to a depth of about 26 inches is dark reddish brown loamy fine sand. Below that is very pale brown and light gray fine sand to a depth of about 48 inches, light gray fine sandy loam to a depth of about 60 inches, and light gray sandy clay loam to a depth of about 73 inches. The underlying material is light gray loamy sand to a depth of at least 80 inches.

Included with this soil in mapping are small areas of Smyrna, Myakka, and Wauchula soils. Smyrna and Myakka soils do not have a loamy subsoil. Wauchula soils are similar to the Pomona soil. The included soils make up about 5 to 15 percent of the map unit.

This Pomona soil has a seasonal high water table within 12 inches of the surface for 1 to 4 months during most years. The available water capacity is low. Permeability is moderate or moderately slow in the lower part of the subsoil.

Most areas of this soil are used as rangeland or woodland. In some areas where water management is adequate, this soil is used for citrus, improved pasture, or truck crops. The natural vegetation is mostly saw palmetto, slash pine, longleaf pine, South Florida slash pine, pineland threeawn, chalky bluestem, fetterbush lyonia, gallberry, and low panicums.

Wetness and droughtiness are very severe limitations affecting cultivated crops. The number of suitable crops is limited unless very intensive water and soil management practices are used. If good water-control and soil-improving measures are used, some vegetable crops can be grown. The water-control system must remove excess water in wet periods and provide water for irrigation in dry periods. Crop rotations should keep close-growing, soil-improving crops on the land three-fourths of the time. Crop residue and soil-improving crops help to maintain organic matter content and protect the soil from erosion. Seedbed preparation should include bedding of the rows. Fertilizer and lime should be added according to the needs of the crop.

Unless intensive management practices are used, this soil is poorly suited to citrus. A carefully designed water control system is required. Citrus trees should be planted on beds, and a plant cover should be maintained between the trees. Fertilizer and lime are needed.

This soil is well suited to pastures of pangolagrass, improved bahiagrass, and white clover. Water-control measures are needed to remove excess surface water after heavy rainfall. Fertilizer and lime are needed, and grazing should be controlled to prevent overgrazing and weakening of the plants.

Typically, the South Florida Flatwoods range site includes areas of this soil. The dominant vegetation is scattered pine trees with an understory of saw palmetto and grass. If good grazing management practices are used, this range site has the potential to produce significant amounts of creeping bluestem, lopsided indiangrass, chalky bluestem, and various panicums. If range deterioration occurs, saw palmetto and pineland threeawn are dominant.

The potential productivity for pine trees is moderately high. The major concerns in management are seedling mortality, plant competition, and the equipment use limitation during periods of heavy rainfall. South Florida slash pine and slash pine are the best trees to plant.

This soil is severely limited as a site for urban development because of the wetness. The high water table interferes with proper functioning of septic tank absorption fields. The absorption fields can be elevated by adding fill material. To overcome the problems caused by wetness on sites used for buildings or local roads and streets, a drainage system can be installed to lower the high water table or fill material can be added to increase the effective depth to the high water table.

The wetness and the sandy surface are severe limitations affecting recreational uses. A water-control system is needed to keep the high water table below a depth of 2.5 feet. Suitable topsoil or pavement can be used to stabilize the surface in heavy traffic areas.

The capability subclass is IVw.

8—Hydraquents, clayey. These soils occur as areas of slime (colloidal clay), a by-product of phosphate mining. The slime has been pumped into holding ponds. These ponds have standing water, and the soil strength is too weak to support a grazing animal. Holding ponds are built with a 30- to 40-foot dike surrounding them. They are designed so that the water flows through a series of ponds before returning to an outlet stream. The ponds cover from 200 to 1,000 or more acres. In older mined areas, the slime was pumped into open pits that did not have outlets. These areas have not dried out.

Included in mapping are a few small areas of Neilhurst soils.

Hydraquents, clayey, are about 85 percent clay, 10 percent silt, and 5 percent sand. The clay is mainly montmorillonite but includes kaolinite, illite, and attapulgite. The soil material is gray and light gray with some yellowish brown mottles. It is neutral to moderately alkaline. This material generally is saturated with water, and the available water capacity is very high. Natural fertility is high, and the organic matter content is low. Permeability is very slow.

Most areas are idle, but after the pumping stops, hyacinths and cattails start to grow. Later, willows grow. These areas form a natural habitat for wetland wildlife. The slow settling velocity of the clay is the main limitation affecting most uses.

Neither a capability subclass nor woodland ordination symbol has been assigned to this map unit.

9—Lynne sand. This poorly drained soil is in broad areas on flatwoods. Areas of this soil range from about 10 to 300 acres. Slopes are smooth to convex and are 0 to 2 percent.

Typically, this soil has a black sand surface layer about 5 inches thick. The subsurface layer is gray to light gray fine sand to a depth of about 21 inches. The subsoil is black fine sand to a depth of about 28 inches, light yellowish brown fine sand to a depth of about 33 inches, and light gray sandy clay to a depth of at least 80 inches.

Included with this soil in mapping are small areas of Felda, Immokalee, Myakka, Pomona, and Wauchula soils. Felda soils do not have a black fine sand subsoil. Immokalee and Myakka soils do not have a clayey subsoil. Pomona and Wauchula soils are similar to the Lynne soil. The included soils make up about 15 to 30 percent of the map unit.

This Lynne soil has a seasonal high water within 12 inches of the surface for 1 to 4 months during most years. The available water capacity is moderate. Permeability is moderately slow in the lower part of the subsoil.

The natural vegetation is mostly slash pine, South Florida slash pine, and longleaf pine and an understory of creeping bluestem, chalky bluestem, indiangrass, low panicums, pineland threeawn, saw palmetto, fetterbush lyonia, and gallberry.

Wetness is a severe limitation affecting cultivated crops. The number of suitable crops is limited unless intensive water-control measures are used. If good water-control and soil-improving measures are used, some vegetable crops can be grown. The water-control system must remove excess water in wet periods and provide water for irrigation in dry periods. Seedbed preparation needs to include bedding of rows. Crop rotations should keep close-growing crops on the land at least two-thirds of the time. Close-growing crops and crop residue help to maintain organic matter content and soil tilth. Regular applications of fertilizer and occasional applications of lime are needed.

This soil is poorly suited to citrus trees because of the wetness. If drainage and bedding are used, oranges and grapefruit can be grown. Drainage should be adequate to remove excess water from the soil rapidly after heavy rainfall.

This soil is well suited to pasture and hay crops, such as pangolagrass, bahiagrass, and clover. Some drainage is needed to remove excess water during wet periods. Lime and fertilizer are needed, and controlled grazing helps to maintain plant vigor.

Typically, the South Florida Flatwoods range site includes areas of this soil. The dominant vegetation is scattered pine trees with an understory of saw palmetto and grass. If good grazing management practices are used, this range site has the potential to produce significant amounts of creeping bluestem, lopsided indiangrass, chalky bluestem, and various panicums. If range deterioration occurs, saw palmetto and pineland threeawn are dominant.

The potential productivity for pine trees is moderately high. The major concerns in management are the equipment use limitation, seedling mortality, and plant competition. Slash pine and South Florida slash pine are the best trees to plant.

This soil has severe limitations affecting septic tank absorption fields, building sites, and local roads and streets. Special measures are required to overcome excessive wetness. Septic tank absorption fields should be elevated by adding suitable fill material.

The wetness is a severe limitation affecting recreational uses. A water-control system that keeps the seasonal high water table below a depth of about 2.5 feet is required. Suitable topsoil or pavement can be used to stabilize the surface in heavy traffic areas.

The capability subclass is IIIw.

10—Malabar fine sand. This poorly drained soil is in low, narrow to broad sloughs and on flatwoods. Areas of this soil range from about 5 to 100 acres. Slopes are smooth to concave and are 0 to 2 percent.

Typically, this soil has a black fine sand surface layer about 5 inches thick. The subsurface layer is grayish brown to light brownish gray fine sand to a depth of about 22 inches. The subsoil is brownish yellow fine sand to a depth of about 30 inches and yellow fine sand to a depth of about 38 inches. Below that is light brownish gray fine sand to a depth of about 48 inches and gray sandy loam and sandy clay loam to a depth of at least 80 inches. A few soft, white, lime nodules are in the sandy clay loam layer.

Included with this soil in mapping are small areas of EauGallie, Felda, Wabasso, Holopaw, and Valkaria soils. EauGallie and Wabasso soils have a black subsoil. Valkaria soils do not have a loamy subsoil. Felda and Holopaw soils are similar to the Malabar soil. The included soils make up 15 to 20 percent of the map unit.

This Malabar soil has a seasonal high water table within 12 inches of the surface for 2 to 4 months during most years. During periods of heavy rainfall, the surface is covered by shallow, slowly moving water for 1 to 7 days or more. The available water capacity is low. Permeability is very slow in the lower part of the subsoil.

Most areas of this soil are in pasture. The natural vegetation is cabbage palm, scattered longleaf pine, South Florida slash pine, slash pine, cypress, live oak, water oak, laurel oak, saw palmetto, waxmyrtle, pineland threeawn, and maidencane.

This soil has severe limitations affecting cultivated crops. Wetness and low natural fertility limit the choice of plants and reduce potential yields. If intensive management and a water-control system are used, some vegetable crops can be grown. The water-control system must remove excess water in wet periods. Row crops should be rotated with close-growing, soil-improving crops that remain on the land three-fourths of the time. Crop residue and soil-improving crops help to maintain organic matter content. Seedbed preparation should include bedding of the rows. Fertilizer and lime should be added according to the needs of the crop.

Unless very intensive management practices are used, this soil is poorly suited to citrus. A carefully designed water-control system must maintain the high water table at an effective depth. Citrus trees should be planted on beds, and a plant cover should be maintained between the trees. Fertilizer and lime are needed.

This soil is well suited to pastures of pangolagrass, improved bahiagrass, and white clover. Water-control measures are needed to remove excess surface water after heavy rainfall. Fertilizer and lime are needed, and grazing should be controlled to prevent overgrazing and weakening of the plants.

Typically, the Slough range site includes areas of this soil. The dominant vegetation is an open expanse of grasses, sedges, and rushes in areas where the soil is saturated during the rainy season. If good grazing management practices are used, this range site includes blue maidencane, maidencane, chalky bluestem, toothachegrass, and Florida bluestem. If excessive grazing occurs, common carpetgrass, an introduced plant, is dominant.

The potential productivity of pine trees is moderately high. Bedding of rows helps in establishing seedlings and removing excess surface water. Major concerns in management are the equipment use limitation, seedling mortality, and plant competition. Slash pine and South Florida slash pine are the best trees to plant.

This soil has severe limitations affecting septic tank absorption fields, building sites, and local roads and streets. Special measures are required to overcome excessive wetness. Septic tank absorption fields should be elevated by adding suitable fill material.

Excessive wetness is a severe limitation affecting recreational development. A water-control system that keeps the seasonal high water table below a depth of about 2.5 feet is required. Suitable topsoil or pavement can be used to stabilize the surface in heavy traffic areas.

The capability subclass is IVw.

11—Arents-Water complex. This map unit is a series of open pits that are filled with water and are paralleled by long steep mounds of soil material. It is a result of phosphate mining. Areas of this map unit range from about 100 to 1,000 acres. Slopes are steep to very steep. The Arents part consists of piles of soil material or overburden that originally covered the phosphate-bearing strata. The Water part of this map unit is formed after the phosphate-bearing strata has been removed (fig. 5). This map unit is about 55 percent Arents and 45 percent water.

Included in mapping are pits that are not filled with water.

The high water table of the Arents-Water complex is variable, but the Arents part generally does not have a water table within a depth of 80 inches. The available water capacity generally is low, but it varies throughout

Figure 5.—This area of Arents-Water complex has been recently mined.

the map unit. Permeability generally is rapid, but it also varies.

Most areas are idle, but some of the older areas support limited grazing. This map unit is not suited to most cultivated crops because of erosion, slope, and the low available water capacity.

Neither a capability subclass nor a woodland ordination symbol has been assigned to this map unit.

12—Neilhurst sand, 1 to 5 percent slopes. This excessively drained soil is on broad uplands and low knolls. It formed in homogenous sandy material from phosphate and silica mining operations. Areas of this soil range from about 100 to 600 acres. Slopes are mainly smooth to concave.

Typically, this soil has a grayish brown sand surface layer about 3 inches thick. The underlying material to a depth of at least 80 inches is light gray sand that is mixed with reddish brown and brown sand. Some areas have coarse sand or fragments of rocks.

Included with this soil in mapping are small areas of Arents and Haplaquents, clayey. Some areas may have intermittent ponds. The included soils make up about 5 to 10 percent of the map unit.

This Neilhurst soil generally does not have a high water table within a depth of 80 inches; however, the water table can be within a depth of 30 inches for brief periods during the summer following heavy rainfall. The available water capacity is very low. Permeability is very rapid.

This soil is not suited to most cultivated crops because of droughtiness and rapid leaching of plant nutrients. It is poorly suited to most plants, and special treatment is required for lawns and ornamental plants.

This soil is poorly suited to citrus; however, if a well designed irrigation system is used, this soil is moderately well suited. A ground cover of close-growing plants should be maintained between the trees to control soil blowing in dry weather and water erosion following rainfall. Fertilizer and soil amendments are needed to maintain plant vigor.

This soil is moderately well suited to pastures of pangolagrass and bahiagrass. Lime and fertilizer are needed. To establish pasture plants, the grass should be planted during the rainy season or irrigation should be used.

The potential productivity for pine trees is moderately high. Experimental plantings of pine have shown good growth. The potential for commercial production is moderate. Major concerns in management are the equipment use limitation, seedling mortality, and plant competition. Slash pine, South Florida slash pine, and longleaf pine are the best trees to plant.

This soil has only slight limitations affecting most urban uses including septic tank absorption fields. Seepage is a severe limitation affecting sites for trench and area sanitary landfills. The sidewalls and bottom of trench sanitary landfills should be lined or sealed. Onsite investigation of building sites is recommended because of different reclamation methods.

The sandy surface is a severe limitation affecting recreational uses. The soil must be stabilized to overcome this problem.

The capability subclass is VIs.

13—Samsula muck. This very poorly drained, organic soil is in swamps and marshes. Areas of this soil range from 30 to several hundred acres. Slopes are smooth and are less than 2 percent.

Typically, this soil is black to dark reddish brown muck to a depth of about 31 inches. The underlying material is sand to a depth of at least 80 inches. It is black in the upper part and dark grayish brown in the lower part.

Included with this soil in mapping are Hontoon and Placid soils. Hontoon soils are similar to the Samsula soil. Placid soils are sandy. The included soils make up about 10 to 20 percent of the map unit.

This Samsula soil has a seasonal high water table at or above the surface except during extended dry periods. Areas on flood plains are subject to frequent flooding as well as to ponding. The available water capacity is high. Permeability is rapid.

The natural vegetation is mostly loblollybay gordonia, cypress, red maple, blackgum, and other water-tolerant trees and pine trees. The ground cover is greenbrier, fern, and other aquatic plants. Aquatic plants are dominant in many areas.

Wetness is a severe limitation affecting cultivated crops. Under natural conditions, this soil is not suitable for cultivation, but with adequate water control it is well suited to most vegetable crops. The water-control system should remove water when crops are on the land and keep the soil saturated with water at other times.

This soil is not suited to citrus.

If adequate water-control measures are used, this soil is well suited to pastures of pangolagrass, bahiagrass, and white clover. Grazing should be controlled to maintain plant vigor and good ground cover. Fertilizer that is high in potash, phosphorus, and minor elements is needed along with lime.

Typically, the Freshwater Marshes and Ponds range site includes areas of this soil. The dominant vegetation is an open expanse of grasses, sedges, rushes, and other herbaceous plants in areas where the soil generally is saturated or covered with water for at least 2 months during the year. If good grazing management practices are used, this range site has the potential to produce more forage than any of the other range sites. Chalky bluestem and blue maidencane dominate the drier parts of the site, and maidencane is dominant in the wetter parts. Other desirable forage includes cutgrass, bluejoint panicum, sloughgrass, and low panicums. Periodic high water levels provide a much needed natural deferment from overgrazing. If excessive grazing occurs, common carpetgrass, an introduced plant, tends to dominate the drier parts of the site.

This soil is not suited to pine trees because of the excessive wetness and the ponding.

This soil has severe limitations affecting septic tank absorption fields, building sites, and local roads and streets. Special measures are required to overcome the excessive wetness. If this soil is used for urban development, the organic material needs to be removed, the area should be backfilled with suitable soil material, and water-control measures must be established.

Excessive wetness and organic matter content are severe limitations affecting recreational uses.

The capability subclass is VIIw.

14—Sparr sand, 0 to 5 percent slopes. This somewhat poorly drained soil is in areas of seasonally wet uplands and knolls on flatwoods. Areas of this soil range from about 10 to 40 acres. Slopes are smooth.

Typically, this soil has a dark gray sand surface layer about 8 inches thick. The subsurface layer is brown to very pale brown sand to a depth of about 57 inches. The subsoil is sandy clay loam to a depth of at least 80 inches. It is very pale brown in the upper part, yellowish brown in the next part, and light gray in the lower part.

Included with this soil in mapping are small areas of Apopka, Candler, Millhopper, and Tavares soils. Apopka soils are well drained. Candler and Tavares soils do not have a loamy subsoil. Millhopper soils are similar to the Sparr soil. The included soils make up 15 to 20 percent of the map unit.

This Sparr soil has a seasonal high water table at a depth of 20 to 40 inches for 1 to 4 months in most years. The available water capacity is low. Permeability is moderately slow or slow in the subsoil.

Most areas of this soil are used for citrus, pasture, or range. The natural vegetation is mostly oak, hickory, magnolia, sweetgum, slash pine, South Florida slash pine, and longleaf pine. The understory includes gallberry, waxmyrtle, scattered saw palmetto, and pineland threeawn.

Droughtiness and rapid leaching of plant nutrients are severe limitations affecting cultivated crops. If good water management and soil-improving measures are used, however, fruit and vegetable crops can be grown. For best yields, crops need to be irrigated during dry periods. Row crops should be planted in sequence with close-growing cover crops that remain on the land three-fourths of the time. Crop residue and cover crops help to protect the soil from erosion. Seedbed preparation should include bedding of the rows. Fertilizer and lime should be added according to the needs of the crop.

In places that are relatively free from freezing temperatures, this soil is well suited to citrus. A water-control system is needed to maintain the water table at an effective depth. A close-growing plant cover should be maintained between the trees to control soil blowing in dry weather and water erosion during heavy rainfall. Good yields of oranges and grapefruit generally can be obtained without irrigation, but increased yields are feasible where irrigation water is readily available. Fertilizer and lime are needed.

This soil is well suited to pasture and hay crops. Deep-rooted plants, such as coastal bermudagrass and bahiagrass, grow well if fertilizer and lime are used. Production is occasionally restricted by extended drought. Grazing should be controlled to maintain plant vigor and good ground cover.

Typically, the Oak Hammock range site includes areas of this soil. The dominant vegetation is a dense canopy of predominantly live oak trees. Because of the dense canopy and relatively open understory, cattle use this range site mainly for shade and resting areas. Desirable forage includes longleaf uniola, low panicums, low paspalum, switchgrass, and lopsided indiangrass.

The potential productivity for pine trees is moderately high. Major concerns in management are the equipment use limitation, seedling mortality, and plant competition. Slash pine and South Florida slash pine are the best trees to plant.

Wetness is a severe limitation affecting septic tank absorption fields, sewage lagoons, and sanitary landfills and a moderate limitation affecting sites for dwellings without basements, small commercial buildings, and local roads and streets. Because seepage is also a severe limitation affecting sewage lagoons and sanitary landfills, the sidewalls of these structures should be sealed. Special measures are required to overcome the excessive wetness of this soil. Septic tank absorption fields should be elevated by adding fill material.

The sandy texture is a severe limitation affecting recreational uses. Suitable topsoil or pavement can be used to stabilize the surface in heavy traffic areas.

The capability subclass is IIIw.

15—Tavares fine sand, 0 to 5 percent slopes. This moderately well drained soil is on broad uplands and knolls on flatwoods. Areas of this soil range from about 10 to 80 acres. Slopes are smooth to convex.

Typically, this soil has a dark grayish brown fine sand surface layer about 8 inches thick. The underlying material to a depth of at least 80 inches is light yellowish brown fine sand that grades to very pale brown.

Included with this soil in mapping are small areas of Adamsville, Candler, Millhopper, Narcoossee, and Zolfo soils. Also included are small areas of soils in which organic-stained layers occur within a depth of 80 inches. Millhopper soils have a loamy subsoil, and Narcoossee and Zolfo soils have a dark subsoil. Adamsville and Candler soils are similar to the Tavares soil. The included soils make up about 10 to 20 percent of the map unit.

This Tavares soil has a seasonal high water table at a depth of 40 to 80 inches for several months in most years. The available water capacity is very low. Permeability is rapid or very rapid.

Most areas of this soil are used for citrus. Some remain in natural vegetation that is mostly South Florida slash pine, slash pine, longleaf pine, turkey oak, bluejack oak, and post oak and an understory of pineland threeawn, creeping bluestem, lopsided indiangrass, hairy panicums, low panicums, and purple lovegrass.

This soil has severe limitations affecting most cultivated crops. Droughtiness and rapid leaching of plant nutrients limit the choice of plants and reduce potential yields of suitable crops. If the high water table is between depths of 40 and 60 inches, it supplements the low available water capacity by providing water through capillary rise. In very dry periods, the water table drops well below the root zone and little capillary water is available to plants. Soil management should include row crops on the contour in strips with close-growing crops. Crop rotations should keep close-growing crops on the land at least two-thirds of the time. Fertilizer and lime are needed for all crops. Soil-improving cover crops and all crop residue should be left on the ground to protect the soil from erosion and to maintain organic matter content. Irrigation of high value crops generally is feasible where irrigation water is readily available.

In places that are relatively free from freezing temperatures, this soil is well suited to citrus. A good ground cover of close-growing plants is needed between the trees to minimize erosion. Fair yields can normally be obtained without irrigation, but optimum yields generally are feasible where irrigation water is readily available. Fertilizer and lime are needed.

This soil is well suited to pastures of pangolagrass, coastal bermudagrass, and bahiagrass. White clover and lespedeza also produce good yields if fertilizer and lime are used. Controlled grazing is needed to maintain vigorous plants for maximum yields.

Typically, the Longleaf Pine-Turkey Oak Hills range site includes areas of this soil. The dominant vegetation is longleaf pine and turkey oak. Because of the rapid movement of plant nutrients and water through this soil, natural fertility is low. Forage production and quality are poor, and cattle do not readily use this range site if other sites are available. Desirable forage includes creeping bluestem, lopsided indiangrass, and low panicums.

The potential productivity for pine trees is moderately high. The major concerns in management are the equipment use limitation, plant competition, and seedling mortality. Longleaf pine, South Florida slash pine, and slash pine are the best trees to plant.

Wetness is a moderate limitation affecting septic tank absorption fields. Ground water contamination is a hazard in high density areas because of poor filtration. Seepage is a severe limitation affecting sewage lagoons and sanitary landfills, and the sidewalls should be sealed. Limitations affecting sites for dwellings without basements, small commercial buildings, and local roads and streets are only slight.

The sandy texture is a severe limitation affecting recreational development. Suitable topsoil or pavement can be used to stabilize the surface in heavy traffic areas.

The capability subclass is IIIs.

16—Urban land. This map unit consists of areas that are more than 85 percent covered by buildings, streets, houses, schools, shopping centers, and industrial complexes. Urban land is mainly in larger towns and fringe areas. Open areas include lawns and playgrounds. Because soils in urban areas have been reworked, they can no longer be recognized as a natural soil. Fill material has been added in wet areas to alleviate water problems, or soil material has been excavated to blend with the surrounding landscape.

Neither a capability subclass nor a woodland ordination symbol has been assigned to this map unit.

17—Smyrna and Myakka fine sands. This map unit consists of poorly drained soils in broad areas on flatwoods. It is about 55 percent Smyrna soil and 40 percent Myakka soil, but the proportion varies in each mapped area. Areas of each soil are large enough to be mapped separately, but because of present and predicted use, these soils were mapped as one unit. Areas of these soils range from 10 to several hundred acres. Slopes are smooth to concave and are 0 to 2 percent.

Typically, this Smyrna soil has a black fine sand surface layer about 4 inches thick. The subsurface layer is gray fine sand to a depth of about 12 inches. The subsoil is dark brown and brown fine sand to a depth of about 25 inches. Below that is very pale brown fine sand to a depth of about 42 inches and very dark brown fine sand to a depth of about 48 inches. The underlying material is brown and light brownish gray fine sand to a depth of at least 80 inches.

Typically, this Myakka soil has a very dark gray fine sand surface layer about 7 inches thick. The subsurface layer is gray fine sand to depth of about 25 inches. The subsoil to a depth of about 36 inches is fine sand. It is black in the upper part and dark brown in the lower part. The underlying material is yellowish brown fine sand to a depth of at least 80 inches.

The Smyrna and Myakka soils have a seasonal high water table within 12 inches of the surface for 1 to 4 months in most years. The available water capacity is low. Permeability is moderate or moderately rapid in the subsoil.

Included with these soils in mapping are small areas of Basinger, Immokalee, Ona, and Pomona soils. Pomona soils have a loamy subsoil. Basinger, Immokalee, and Ona soils are similar to the Smyrna and Myakka soils. The included soils make up 5 to 15 percent of the map unit.

The natural vegetation on Smyrna and Myakka soils is mostly longleaf pine, slash pine, South Florida slash pine, saw palmetto, running oak, gallberry, waxmyrtle, huckleberry, pineland threeawn, and scattered fetterbush lyonia. A few areas around large lakes are in oak hammocks.

Wetness and droughtiness are severe limitations affecting cultivated crops. The number of suitable crops is limited unless very intensive management practices are used. If good water-control and soil-improving measures are used, some vegetable crops can be grown. A water-control system must remove excess water in wet periods and provide irrigation water in dry periods. Crop rotation should keep close-growing, soil-improving crops on the land three-fourths of the time. Crop residue and soil-improving crops help to maintain organic water content and protect the soil from eroding. Seedbed preparation should include bedding of the rows. Fertilizer and lime should be added according to the needs of the crop.

Unless very intensive water management practices are used, these soils are poorly suited to citrus. Areas subject to frequent freezing are not suitable. A water-control system must maintain the water table at an effective depth. Citrus trees should be planted on beds, and a plant cover should be maintained between the trees. Fertilizer and lime are needed.

These soils are well suited to pastures of pangolagrass, improved bahiagrass, and white clover. Water-control measures are needed to remove excess surface water after heavy rainfall. Fertilizer and lime are needed, and grazing should be controlled to prevent overgrazing and weakening of the plants.

Typically, the South Florida Flatwoods range site includes areas of these soils. The dominant vegetation is scattered pine trees with an understory of saw palmetto and grass. If good grazing management practices are used, this range site has the potential to produce significant amounts of creeping bluestem, lopsided indiangrass, chalky bluestem, and various panicums. If range deterioration occurs, saw palmetto and pineland threeawn are dominant.

The potential productivity for pine trees is moderate. The major concerns in management are the equipment use limitation, seedling mortality, and plant competition. South Florida slash pine and slash pine are the best trees to plant.

These soils are severely limited as sites for urban development because of the wetness during rainy periods. The high water table interferes with proper functioning of septic tank absorption fields. Fill material can be used to elevate the absorption field. Special measures are needed to overcome the wetness limitation at sites for buildings and local roads and streets. If adequate water outlets are available, drainage can be installed to keep the high water table below a depth of 2.5 feet. Building sites and roadbeds can also be elevated by adding fill material to increase the effective depth to the high water table.

The wetness and the sandy surface are severe limitations affecting recreational uses. A water-control system is needed to keep the high water table below a depth of about 2.5 feet. Suitable topsoil or pavement can be used to stabilize the soil in heavy traffic areas.

The capability subclass is IVw.

19—Floridana mucky fine sand, depressional. This very poorly drained soil is in depressional areas mostly on flatwoods. Areas of this soil range from 3 to several hundred acres. Slopes are smooth to concave and are 0 to 2 percent.

Typically, this soil has a surface layer that is 15 inches thick. The upper part is black mucky fine sand and the lower part is black fine sand. The subsurface layer to a depth of about 28 inches is fine sand. It is gray in the upper part and grayish brown in the lower part. The subsoil is grayish brown sandy clay loam to a depth of about 40 inches, light grayish brown sandy clay loam to a depth of about 48 inches, gray sandy clay loam to a depth of about 58 inches, and greenish gray sandy loam to a depth of at least 80 inches.

Included with this soil in mapping are small areas of Chobee, Felda, Holopaw, and Kaliga soils. Chobee soils have a loamy subsoil within 20 inches of the surface. Kaliga soils are organic. Felda and Holopaw soils are similar to the Floridana soil. The included soils make up 15 to 20 percent of the map unit.

This Floridana soil is ponded for more than 6 months during most years. Areas on flood plains are subject to frequent flooding as well as to ponding. The available water capacity is moderate. Permeability is very slow or slow.

Most of the acreage of this soil remains in natural vegetation that is mostly cypress, blackgum, bay, red maple, myrtle, pickerelweed, sedges, and water-tolerant grasses.

Unless this soil is drained, it is too wet for cultivated crops, pasture, or planted pine trees. Drainage outlets need to be located before drainage can be applied.

This soil is not suited to citrus.

Typically, the Freshwater Marshes and Ponds range site includes areas of this soil. The dominant vegetation is an open expanse of grasses, sedges, rushes, and other herbaceous plants in areas where the soil generally is saturated or covered with water for at least 2 months during the year. If good grazing management practices are used, this range site has the potential to produce more forage than any of the other range sites. Chalky bluestem and blue maidencane dominate the drier parts of the site, and maidencane is dominant in the wetter parts. Other desirable forage includes cutgrass, bluejoint panicum, sloughgrass, and low panicums. Periodic high water levels provide a much needed natural deferment from overgrazing. If excessive grazing occurs, common carpetgrass, an introduced plant, tends to dominate the drier parts of the site.

This soil is severely limited as a site for most urban uses because of the wetness during periods of heavy rainfall. The high water table interferes with proper functioning of septic tank absorption fields, sewage lagoons, and sanitary landfills. Ponding is a severe limitation affecting building sites and local roads and streets.

The ponding is a severe limitation affecting recreational uses. It is difficult to overcome because most areas are depressional. In areas that are suitable, topsoil or suitable fill material must be added to improve trafficability.

The capability subclass is VIIw.

20—Fort Meade sand, 0 to 5 percent slopes. This well drained soil is on upland ridges. Areas of this soil range from 20 to several hundred acres. Slopes are smooth to convex.

Typically, this soil has a very dark gray sand surface layer about 25 inches thick. The underlying material to a depth of at least 80 inches is brown sand that grades to yellowish brown.

Included with this soil in mapping are small areas of Apopka, Candler, and Tavares soils. Apopka soils have a loamy subsoil. Candler and Tavares soils are similar to the Fort Meade soil. The included soils make up 15 to 20 percent of the map unit.

This Fort Meade soil does not have a high water table within a depth of 72 inches. The available water capacity is low. Permeability is rapid.

Most areas of this soil are in citrus. Some remain in natural vegetation that is mostly longleaf pine, slash pine, South Florida slash pine, oak, hickory, cabbage palm, and magnolia. The understory is widely spaced saw palmetto, pineland threeawn, bluestem, lopsided indiangrass, paspalum, and panicum.

Droughtiness and rapid leaching of plant nutrients are severe limitations affecting cultivated crops. Intensive soil management practices are required. Crop rotations should keep close-growing cover crops on the land at least two-thirds of the time. Frequent applications of fertilizer and lime are needed. Soil-improving crops and crop residue help to maintain organic matter content and protect the soil from erosion. Irrigation of a few high value crops generally is feasible if irrigation water is readily available.

In places that are relatively free from freezing temperatures, this soil is suited to citrus. A good ground cover of close-growing plants is needed between the trees to control soil blowing. Good yields of oranges and grapefruit can be obtained in most years without irrigation, but increased yields are feasible where irrigation water is readily available.

This soil is well suited to pasture. Deep-rooted plants, such as coastal bermudagrass and bahiagrass, normally grow well if fertilizer and lime are used. Yields are limited by drought in prolonged dry periods. Controlled grazing is needed to maintain plant vigor for best yields.

Typically, the Upland Hardwood Hammock range site includes areas of this soil. The dominant vegetation is a dense canopy of oak, magnolia, and hickory. Because of the dense canopy and relatively open understory, cattle use this range site mainly for shade and resting areas. Desirable forage includes indiangrass, switchgrass, longleaf uniola, and chalky bluestem.

The potential productivity for pine trees is moderately high. The major concerns in management, which are caused by the sandiness of the soil, are seedling mortality, plant competition, and the equipment use limitation. Slash pine, South Florida slash pine, and longleaf pine are the best trees to plant.

This soil has only slight limitations affecting most urban uses; however, seepage is a severe limitation affecting sanitary landfills.

The sandy surface is a moderate limitation affecting recreational uses, and trafficability is only fair. Some form of surfacing can be used to reduce or overcome this limitation.

The capability subclass is IIIs.

21—Immokalee sand. This poorly drained soil is in broad areas on flatwoods. Areas of this soil range from 20 to several hundred acres. Slopes are smooth to concave and are 0 to 2 percent.

Typically, this soil has a very dark gray sand surface layer about 7 inches thick. The subsurface layer to a depth of about 39 inches is light gray sand that grades to white. The subsoil is black sand to a depth of about 58 inches. Below that is gray sand to a depth of about 66 inches, very dark gray sand to a depth of about 75 inches, and black sand to a depth of at least 80 inches.

Included with this soil in mapping are small areas of Basinger, Myakka, and Smyrna soils. These soils are similar to the Immokalee soil. Also included are soils that are similar to the Immokalee soil but have a Bh horizon at a depth of more than 50 inches or have loamy material at a depth of more than 40 inches. The loamy material has low base saturation. The included soils make up 15 to 20 percent of the map unit.

This Immokalee soil has a seasonal high water table within 12 inches of the surface for 1 to 4 months in most years. The available water capacity is low. Permeability is moderate in the subsoil.

Most of the acreage of this soil is in pasture or forest. The natural vegetation is longleaf pine, South Florida slash pine, slash pine, saw palmetto, gallberry, waxmyrtle, oak, fetterbush lyonia, and pineland threeawn.

This soil has very severe limitations affecting cultivated crops. Wetness and low natural fertility limit the choice of plants and reduce potential yields. If intensive management practices and a water-control system are used, some vegetables can be grown. The water-control system must remove excess water in wet periods and supply water as needed in dry periods. Crop residue and soil-improving cover crops add organic matter to the soil and improve fertility. Fertilizer should be applied according to the needs of the crop.

This soil generally is poorly suited to citrus because of the excessive wetness. It is suitable only if a water-control system is used to maintain the water table at an effective depth. Citrus trees should be planted on beds, and a plant cover should be maintained between the trees. Fertilizer and lime are needed.

This soil is well suited to pasture and hay crops; however, a good water-control system is needed to remove excess water. Pangolagrass and bahiagrass are suitable pasture plants. Grasses respond to regular applications of fertilizer and lime. Grazing should be controlled to maintain plant vigor and a good ground cover.

Typically, the South Florida Flatwoods range site includes areas of this soil. The dominant vegetation is scattered pine trees with an understory of saw palmetto and grass. If good grazing management practices are used, this range site has the potential to produce significant amounts of creeping bluestem, lopsided indiangrass, chalky bluestem, and various panicums. If range deterioration occurs, saw palmetto and pineland threeawn are dominant.

The potential productivity for pine trees is moderate. The major concerns in management are seedling mortality, plant competition, and the equipment use limitation during periods of heavy rainfall. Slash pine and South Florida slash pine are the best trees to plant.

This soil has severe limitations affecting septic tank absorption fields, building sites, and local roads and streets. Special measures are required to overcome the excessive wetness. Septic tank absorption fields can be elevated by adding fill material. Foundations and roadbeds require special measures that provide additional soil strength.

The excessive wetness and the sandy texture are severe limitations affecting recreational uses. A water-control system that keeps the seasonal high water table below a depth of about 2.5 feet is required. Suitable topsoil or pavement can be used to stabilize the soil surface in heavy traffic areas.

The capability subclass is IVw.

22—Pomello fine sand. This moderately well drained soil is on low, broad ridges and low knolls on flatwoods. Areas of this soil range from about 10 to 100 acres. Slopes are smooth to convex and are 0 to 2 percent.

Typically, this soil has a dark gray fine sand surface layer about 5 inches thick. The subsurface layer is white fine sand to a depth of about 48 inches. The subsoil to a depth of about 53 inches is dark reddish brown fine sand that is coated with organic matter. To a depth of about 63 inches, it is black fine sand that is coated with organic matter. The underlying material is dark brown fine sand to a depth of at least 80 inches. In a few areas the subsoil is weakly cemented by organic matter.

Included with this soil in mapping are small areas of Archbold, Duette, Immokalee, and Satellite soils. Archbold and Satellite soils do not have a dark subsoil. Immokalee soils are poorly drained. Duette soils are similar to the Pomello soil. The included soils make up about 15 to 30 percent of the map unit.

This Pomello soil has a seasonal high water table at a depth of 24 to 40 inches for 1 to 4 months in most years. The available water capacity is very low. Permeability is moderately rapid in the subsoil.

Most of the acreage of this soil is rangeland or woodland. Some areas are cleared for improved pasture or citrus. The natural vegetation is various scrub oaks, longleaf pine, sand pine, South Florida slash pine, slash pine, saw palmetto, fetterbush lyonia, tarflower, and pineland threeawn.

This soil has severe limitations affecting most cultivated crops. Droughtiness, low fertility, and rapid leaching of plant nutrients limit the choice of plants and the potential yields. Irrigation is needed in most areas for best plant growth during dry periods. Returning crop residue to the soil and planting cover crops add organic matter to the soil, improve fertility, and reduce soil loss by wind and water action. Fertilizer and lime should be applied according to the needs of the crop.

This soil is poorly suited to citrus, mainly because of the droughtiness. Fair yields of citrus can be obtained if a carefully designed irrigation system and good management are used.

Even if good management practices are used, this soil is poorly suited to pasture and hay crops. Yields are reduced by periodic droughts. Bahiagrass is the most suitable pasture plant. Grasses respond to fertilizer and lime. Grazing should be controlled to maintain plant vigor and a good ground cover.

Typically, the Sand Pine Scrub range site includes areas of this soil. The dominant vegetation is scrub oaks, saw palmetto, and other shrubs. Sand pine is not on all sites. The droughtiness limits the potential for producing native forage. If good grazing management practices are used, this range site has the potential to provide limited amounts of lopsided indiangrass, creeping bluestem, and switchgrass. Livestock generally do not use this range site; however, protection and dry bedding ground during wet periods are provided on this range site.

The potential productivity for pine trees is moderate. The major concerns in management are the equipment use limitation, seedling mortality caused by droughtiness, and plant competition. South Florida slash pine, slash pine, and longleaf pine are the best trees to plant.

This soil has moderate or severe limitations affecting most urban uses. Wetness and poor filtration are severe limitations affecting septic tank absorption fields. Seepage, the wetness, and the sandy texture are severe limitations affecting sanitary landfills. Trenches should be sealed. Wetness is a moderate limitation affecting building sites. Ditching and land shaping help to overcome these limitations.

The sandy texture is a severe limitation affecting recreational uses. Suitable topsoil or other material should be added to improve trafficability.

The capability subclass is VIs.

23—Ona fine sand. This poorly drained soil is in broad areas on flatwoods. Areas of this soil range from about 10 to 100 acres. Slopes are smooth to concave and are 0 to 2 percent.

Typically, this soil has a black and very dark gray fine sand surface layer about 10 inches thick. The subsoil is dark brown fine sand to a depth of about 24 inches. Below that is grayish brown fine sand to a depth of about 50 inches and dark brown fine sand to a depth of 80 inches.

Included with this soil in mapping are small areas of Basinger, Immokalee, Myakka, and Smyrna soils. These soils are similar to the Ona soil. Also included are soils that are similar to the Ona soil except they have a 4- to 6-inch layer of organic material on the surface. The included soils make up about 10 to 30 percent of the map unit.

This Ona soil has a seasonal high water table within 12 inches of the surface for 1 to 4 months in most years. The available water capacity is low. Permeability is moderate in the subsoil.

Most areas are used for range or woodland. Areas where water control is adequate are used for citrus, improved pasture, or truck crops. The natural vegetation is mostly slash pine, South Florida slash pine, longleaf pine, saw palmetto, running oak, gallberry, waxmyrtle, pineland threeawn, and scattered fetterbush lyonia.

This soil is very severely limited for cultivated crops unless an intensive water-control system is used. The water-control system must remove excess water in wet periods and provide subsurface irrigation in dry periods. If a water-control system is used, many kinds of vegetables can be grown. Good management also includes crop rotations that keep close-growing, soil-improving crops on the land at least two-thirds of the time. These crops and crop residue help to protect the soil from erosion and to maintain organic matter content. Fertilizer and lime should be added according to the need of the crop.

This soil generally is poorly suited to citrus. If drained, it is moderately well suited. Drainage must remove excess water from the soil rapidly and maintain the water table at an effective depth. Citrus trees should be planted on beds. A ground cover of close-growing plants between the trees helps to protect the soil from erosion by wind and water. Regular applications of fertilizer and occasional applications of lime are needed.

Highest yields require irrigation.

This soil is well suited to pastures of pangolagrass, improved bahiagrass, and white clover. Water-control measures are needed to remove excess surface water after heavy rainfall. Fertilizer and lime are needed, and grazing should be controlled to prevent overgrazing and weakening of the plants.

Typically, the South Florida Flatwoods range site includes areas of this soil. The dominant vegetation is scattered pine trees with an understory of saw palmetto and grass. If good grazing management practices are used, this site has the potential to produce significant amounts of creeping bluestem, lopsided indiangrass, chalky bluestem, and various panicums. If range deterioration occurs, saw palmetto and pineland threeawn are dominant.

The potential productivity for pine trees is moderately high. Bedding of rows helps in establishing seedlings and removing excess surface water. The major concerns in management are seedling mortality, plant competition, and the equipment use limitation during periods of heavy rainfall. South Florida slash pine and slash pine are the best trees to plant.

This soil is severely limited as a site for urban development because of the wetness during rainy periods. The high water table interferes with proper functioning of septic tank absorption fields. Suitable fill material is needed to elevate the absorption fields. Special measures are needed to overcome the wetness limitation affecting building sites and local roads and streets. If adequate outlets are available, drainage can prevent the high water table from rising above an effective depth. Building sites and roadbeds can be elevated by adding fill material to increase the effective depth to the high water table.

The wetness and the sandy surface are severe limitations affecting recreational uses. The limitations caused by wetness can be overcome if a water-control system can be established. Suitable topsoil or pavement can be used to stabilize the surface in heavy traffic areas.

The capability subclass is IIIw.

24—Nittaw sandy clay loam, frequently flooded. This very poorly drained soil is on flood plains. Areas of this soil range from 50 to several hundred acres. Slopes are smooth to concave and are 0 to 2 percent.

Typically, this soil has a black sandy clay loam surface layer about 6 inches thick. The subsoil extends to a depth of about 75 inches. The upper part is very dark gray sandy clay, and the lower part is gray clay that grades to dark gray loam that has red and olive mottles. The underlying material is gray loamy sand to a depth of at least 80 inches.

Included with this soil in mapping are areas of Chobee, Floridana, and Kaliga soils. Also included are areas of Nittaw soils that have a muck, mucky fine sand, or fine sandy loam surface layer. Floridana soils are sandy to a depth of more than 20 inches. Kaliga soils are organic. Chobee soils are similar to the Nittaw soil. The included soils make up about 5 to 15 percent of the map unit.

The Nittaw soil has a seasonal high water table within 12 inches of the surface for at least 6 months during most years. Most areas are flooded during the rainy season. The available water capacity is high. Permeability is slow.

Most of the acreage of this soil is in natural vegetation that is mainly mixed hardwoods including red maple, sugarberry, and gum. Baldcypress, cabbage palm, and oak are in some areas. The understory includes waxmyrtle and a few shade- and water-tolerant forbs and grasses.

The flooding and the wetness limit the use of this soil for cultivated crops, citrus, or pasture.

The potential productivity for pine trees is low; however, pine trees can be highly productive if water-control systems are developed. The major concerns in management are severe seeding mortality and the equipment use limitation caused by the wetness. Slash pine and South Florida slash pine are the best trees to plant. Areas of this soil generally are not planted to pine trees.

This soil is not suited to urban or recreational uses because of the wetness and the flooding.

The capability subclass is Vw.

25—Placid and Myakka fine sands, depressional. This map unit consists of very poorly drained Placid and Myakka soils in depressions mostly on flatwoods. Typically, about 60 percent of the map unit is Placid soil and 30 percent is Myakka soil, but the proportion varies in each mapped area. Some areas have only one of these soils. Areas of each soil are large enough to be mapped separately, but because wetness limits their present and predicted use, they were mapped as one unit. In a typical area, Placid soil is in the lowest positions on the landscape and Myakka soil is in the higher positions adjacent to the flatwoods. Areas of these soils range from 5 to 40 acres. Slopes are smooth to concave and are 0 to 2 percent.

Typically, this Placid soil has a black fine sand surface layer about 18 inches thick. The underlying material is dark gray fine sand to a depth of about 28 inches, light gray fine sand to a depth of about 60 inches, and grayish brown fine sand to a depth of at least 80 inches.

This Placid soil is ponded for at least 6 months during most years. The available water capacity is moderate. Permeability is rapid.

Typically, this Myakka soil has a very dark gray fine sand surface layer about 3 inches thick. The subsurface layer is grayish brown fine sand to a depth of about 25 inches. The subsoil is black fine sand to a depth of about 35 inches. The underlying material is dark gray fine sand to a depth of at least 80 inches.

This Myakka soil has a seasonal high water table that is above the surface for about 6 months during most years. The available water capacity is low. Permeability is moderate or moderately rapid in the subsoil.

Included in mapping are areas of Basinger, Ona, Pomona, and St. Johns soils. Pomona soils have a loamy subsoil. Basinger, Ona, and St. Johns soils are similar to the Placid and Myakka soils. The included soils make up 5 to 10 percent of the map unit.

Most areas of the Placid and Myakka soils are in natural vegetation that is mostly bay, scattered cypress, blackgum, St. Johnswort, maidencane, and other water-tolerant plants.

These soils are not suited to commonly grown crops because of the wetness and the ponding.

These soils are poorly suited to pasture because of the wetness and the ponding; however, during the winter limited grazing occurs around the fringe areas of the ponds.

Typically, the Freshwater Marshes and Ponds range site includes areas of these soils. The dominant vegetation is an open expanse of grasses, sedges, rushes, and other herbaceous plants in areas where the soil generally is saturated or covered with water for at least 2 months during the year. If good grazing management practices are used, this range site has the potential to produce more forage than any of the other range sites. Chalky bluestem and blue maidencane dominate the drier parts of the site, and maidencane is dominant in the wetter parts. Other desirable forage includes cutgrass, bluejoint panicum, sloughgrass, and low panicums. Periodic high water levels provide a much needed natural deferment from overgrazing. If excessive grazing occurs, common carpetgrass, an introduced plant, tends to dominate the drier parts of the site.

These soils are not suited to pine trees because of the wetness and the ponding.

These soils have severe limitations affecting urban and recreational uses because of the wetness and the ponding. Drainage and large amounts of fill material are needed to make these soils suitable for these uses. Most areas do not have suitable outlets for excess water.

The capability subclass is VIIw.

26—Lochloosa fine sand. This somewhat poorly drained soil is mostly in lower positions on uplands and on low ridges on flatwoods. Areas of this soil range from 5 to 80 acres. Slopes are smooth to concave and are 0 to 2 percent.

Typically, this soil has a dark gray fine sand surface layer about 6 inches thick. The subsurface layer is very pale brown fine sand to a depth of about 36 inches. The subsoil is sandy clay loam to a depth of about 65 inches. It is pale brown in the upper part, light brownish gray in the next part, and gray in the lower part. The underlying material is gray sandy clay loam to a depth of at least 80 inches.

Included in mapping are small areas of Adamsville, Kendrick, Millhopper, and Sparr soils. Adamsville soils do not have a loamy subsoil. Kendrick soils are well drained. Millhopper and Sparr soils are similar to the Lochloosa soil. The included soils make up about 5 to 10 percent of the map unit.

This Lochloosa soil has a seasonal high water table at a depth of 30 to 60 inches for 1 to 4 months during most years. It is at a depth of about 15 inches for 1 to 3 weeks during wet periods. The available water capacity is moderate. Permeability is slow in the subsoil.

Most areas of this soil are used for improved pasture, citrus, or truck crops. Some are in natural vegetation that is mostly slash pine, South Florida slash pine, hickory, live oak, laurel oak, water oak, sweetgum, and magnolia.

Wetness is a moderate limitation affecting most cultivated crops. The seasonal high water table limits the choice of plants and reduces potential yields. Crop rotations should keep close-growing cover crops on the land at least two-thirds of the time. Soil-improving cover crops and crop residue help to protect against erosion and to maintain organic matter content. Irrigating high value crops generally is feasible if water is readily available. Fertilizer and lime are needed.

Unless very intensive management practices are used, this soil is poorly suited to citrus. Areas that are subject to frequent freezing are not suited. This soil is moderately suited if a water-control system is used to maintain the water table at an effective depth. Citrus trees should be planted on beds, and a plant cover should be maintained between the trees. Fertilizer and lime are needed.

The soil is well suited to pasture and hay crops, such as coastal bermudagrass and bahiagrass. Grasses respond to fertilizer and lime. Grazing should be controlled to maintain plant vigor for highest yields.

Typically, the Oak Hammock range site includes areas of this soil. The dominant vegetation is a dense canopy of predominantly live oak trees. Because of the dense canopy and relatively open understory, cattle use this range site mainly for shade and resting areas. Desirable forage includes longleaf uniola, low panicums, low paspalum, switchgrass, and lopsided indiangrass.

The potential productivity for pine trees is high. Slash pine and South Florida slash pine are the best trees to plant.

This soil is severely limited as a site for urban development because of the wetness during rainy periods. The high water table interferes with proper functioning of septic tank absorption fields. Fill material can be used to elevate the absorption fields. This soil has only slight limitations affecting sites for buildings and local roads and streets.

The sandy surface is a severe limitation affecting recreational uses. This limitation can be overcome by adding suitable topsoil or other material in heavy traffic areas.

The capability subclass is IIw.

27—Kendrick fine sand, 0 to 5 percent slopes. This well drained soil is on broad uplands and high knolls on flatwoods. Areas of this soil range from 40 to several hundred acres. Slopes are smooth to concave.

Typically, this soil has a very dark grayish brown fine sand surface layer about 9 inches thick. The subsurface layer is brownish yellow fine sand to a depth of about 29 inches. The subsoil to a depth of about 34 inches is brownish yellow fine sandy loam. To a depth of about 64 inches it is yellowish brown and brownish yellow sandy clay loam that is 1 to 5 percent plinthite. The underlying material is gray sandy clay loam that is mottled in shades of brown and red.

Included with this soil in mapping are small areas of Apopka, Candler, and Millhopper soils. Candler soils do not have a loamy subsoil. Apopka and Millhopper soils are similar to the Kendrick soil. The included soils make up about 10 to 30 percent of the map unit.

This Kendrick soil does not have a water table within a depth of 80 inches. The available water capacity is moderate. Permeability is slow or moderately slow in the subsoil.

Most areas of this soil are used for citrus or improved pasture. The natural vegetation is mostly longleaf pine, South Florida slash pine, slash pine, hickory, magnolia, laurel oak, and live oak. The understory includes bluestem, indiangrass, hairy panicum, and annual forbs.

A moderate hazard of erosion affects cultivated crops, and erosion-control measures are needed. These measures include contour cultivation of row crops planted in strips with cover crops. Crop rotations should keep cover crops on the land at least half the time. Cover crops and crop residue help to maintain organic matter content and control erosion. Maximum yields require good seedbed preparation, fertilizer, and lime. This soil is droughty in dry periods, and yields are often reduced by untimely droughts. Irrigation of some high value crops is feasible if irrigation water is readily available.

In places that are relatively free from freezing temperatures, this soil is well suited to citrus. A good ground cover of close-growing plants is needed between the trees to control erosion. Fertilizer, lime, and a well designed irrigation system are needed for highest yields.

This soil is well suited to pasture and hay crops. Clover, tall fescue, coastal bermudagrass, and improved bahiagrass produce good yields if properly managed. Fertilizer, lime, and controlled grazing help to maintain vigorous plants for highest yields and good ground cover.

Typically, the Upland Hardwood Hammock range site includes areas of this soil. The dominant vegetation is a dense canopy of oak, magnolia, and hickory. Because of the dense canopy and relatively open understory, cattle use this range site mainly for shade and resting areas. Desirable forage includes indiangrass, switchgrass, longleaf uniola, and chalky bluestem.

The potential productivity for pine trees is high. The moderate equipment use limitation, seedling mortality, and plant competition are concerns in management. Slash pine and South Florida slash pine are the best trees to plant.

This soil is well suited to most urban uses; however, seepage is a severe limitation affecting sewage lagoons and area sanitary landfills. Sidewalls of these structures need to be sealed and stabilized.

The sandy surface is a severe limitation affecting recreational uses. This limitation can be easily overcome by adding suitable topsoil or constructing permanent covering in heavy traffic areas.

The capability subclass is IIe.

29—St. Lucie fine sand, 0 to 5 percent slopes. This excessively drained soil is on dune-like ridges and isolated knolls. Areas of this soil range from about 5 to 105 acres. Slopes are smooth to concave.

Typically, this soil has a gray fine sand surface layer about 3 inches thick. The underlying material is white fine sand to a depth of 80 inches.

Included with this soil in mapping are small areas of Archbold, Astatula, Candler, Duette, and Tavares soils. Duette soils have a dark subsoil. Archbold, Astatula, Candler, and Tavares soils are similar to the St. Lucie soil. The included soils make up 5 to 15 percent of the map unit.

This St. Lucie soil does not have a water table within a depth of 72 inches. The available water capacity is very low. Permeability is very rapid.

Most areas of this soil are in natural vegetation. A few areas have been cleared for urban development. The natural vegetation is mostly sand pine, sand live oak, Chapman oak, myrtle oak, scattered bluejack oak, and turkey oak. The understory includes Rosemary, pricklypear, and lichens.

This soil is not suited to cultivated crops, citrus, or pasture because of droughtiness and the rapid leaching of plant nutrients.

Typically, the Sand Pine Scrub range site includes areas of this soil. The dominant vegetation is a fairly dense stand of sand pine with a dense understory of oak, saw palmetto, and other shrubs. Because of past timber management practices, sand pine is not on all sites. Droughtiness limits the potential for producing native forage. If good grazing management practices are used, this site has the potential to provide limited amounts of lopsided indiangrass, creeping bluestem, and switchgrass. Livestock generally do not use this range site if more productive sites are available. Summer shade, winter protection, and dry bedding ground during wet periods are provided on this range site.

The potential productivity for sand pine is low. The major concerns in management are the severe equipment use limitation caused by the loose, sandy surface and seedling mortality caused by droughtiness. Sand pine is the best tree to plant.

This soil has only slight limitations affecting most urban uses; however, seepage is a severe limitation affecting sewage lagoons and landfill areas. The sidewalls and bottom of lagoons and landfills should be sealed.

The sandy surface causes poor trafficability in recreational areas. The addition of suitable topsoil or some form of surfacing can reduce or overcome this limitation.

The capability subclass is VIIs.

30—Pompano fine sand. This poorly drained soil is on broad, low flatwoods. Areas of this soil range from 5 to 200 acres. Slopes are smooth to concave and are 0 to 2 percent.

Typically, the surface layer of this soil to a depth of about 15 inches is dark gray fine sand that grades to grayish brown. The underlying material is very pale brown fine sand to a depth of about 35 inches and light gray fine sand to a depth of at least 80 inches.

Included with this soil in mapping are small areas of Anclote, Basinger, and Placid soils. These soils are similar to the Pompano soil. The included soils make up 15 to 20 percent of the map unit.

This Pompano soil has a seasonal high water table within a depth of 12 inches for 2 to 4 months during most years. The available water capacity is very low, and permeability is rapid.

Most areas of this soil are in range or pasture. The natural vegetation consists of widely spaced cypress, South Florida slash pine, and slash pine with an understory of saw palmetto, creeping bluestem, lopsided indiangrass, pineland threeawn, sand cordgrass, and panicums.

Wetness and droughtiness are very severe limitations affecting cultivated crops. If water-control and soil-improving measures are used, vegetable crops can be grown. Crop rotations should include close-growing, soil-improving crops. Crop residue and soil-improving crops help to maintain organic matter content and protect the soil from erosion.

In its natural condition, this soil is poorly suited to citrus. A carefully designed water-control system is needed to maintain the water table at an effective depth.

This soil is well suited to pastures of pangolagrass, improved bahiagrass, and white clover.

Typically, the Slough range site includes areas of this soil. The dominant vegetation is a few scattered pine trees surrounded by grasses, sedges, and rushes. If good grazing management practices are used, this site has the potential to produce significant amounts of blue maidencane, maidencane, toothachegrass, chalky bluestem, and Florida bluestem. If range deterioration occurs, common carpetgrass, an introduced plant, is dominant.

The potential productivity for pine trees is moderate. The major concerns in management are the equipment use limitation, seedling mortality, and plant competition. Slash pine and South Florida slash pine are the best trees to plant.

This soil is severely limited as a site for urban uses mostly because of the wetness. In addition, seepage and poor filtration are limitations affecting sanitary facilities. Limitations affecting septic tank absorption fields can be overcome by mounding and backfilling to maintain the system above the seasonal high water table.

The wetness and the sandy surface are severe limitations affecting recreational uses. A water-control system and suitable topsoil or resurfacing can help to overcome these limitations.

The capability subclass is IVw.

31—Adamsville fine sand. This somewhat poorly drained soil is on low ridges on flatwoods and in low areas on uplands. Areas of this soil range from about 11 to several hundred acres. Slopes are smooth and are 0 to 2 percent.

Typically, this soil has a very dark gray fine sand surface layer about 6 inches thick. The underlying material to a depth of at least 80 inches is light yellowish brown fine sand that grades to very pale brown.

Included with this soil in mapping are small areas of Tavares, Satellite, and Zolfo soils. Tavares and Satellite soils are similar to the Adamsville soil. Zolfo soils have a dark subsoil. The included soils make up 15 to 20 percent of the map unit.

This Adamsville soil has a seasonal high water table at a depth of 20 to 40 inches for 2 to 6 months during most years. The available water capacity is low. Permeability is rapid.

Most areas of this soil are in citrus. Some remain in natural vegetation that is mostly slash pine, longleaf pine, laurel oak, and water oak and an understory of saw palmetto, pineland threeawn, indiangrass, bluestem, and panicums.

Periodic wetness and droughtiness are very severe limitations affecting cultivated crops. The number of suitable crops is very limited unless intensive water-control measures are used. A water-control system must remove excess water in wet periods and provide irrigation in dry periods. If a water-control system is used, this soil is well suited to many kinds of flowers and vegetables. Soil-improving crops and crop residue help to maintain organic matter content and protect the soil from erosion.

Unless this soil is drained, it is not suited to citrus. If a well designed drainage system is used, this soil is moderately suited. Citrus trees should be planted on beds. A ground cover of close-growing plants should be maintained between the trees to control soil blowing in dry weather and water erosion during rainfall.

This soil is moderately well suited to pastures of pangolagrass and bahiagrass. Simple drainage is needed to remove excess surface water in times of heavy rainfall.

Typically, the South Florida Flatwoods range site includes areas of this soil. The dominant vegetation is scattered pine trees with an understory of saw palmetto and grass. If good grazing management practices are used, this site has the potential to produce significant amounts of creeping bluestem, lopsided indiangrass, chalky bluestem, and various panicums. If range deterioration occurs, saw palmetto and pineland threeawn are dominant.

The potential productivity for pine trees is moderately high. The major management concerns, caused by droughtiness, sandiness, and seasonal wetness, are the equipment use limitation, seedling mortality, and plant competition. Slash pine, South Florida slash pine, and longleaf pine are the best trees to plant.

This soil has moderate or severe limitations affecting most urban uses. The wetness and poor filtration are severe limitations affecting septic tank absorption fields. Seepage, the wetness, and the sandy texture are severe limitations affecting sanitary landfills. Landfill trenches should be sealed. The wetness is a moderate limitation affecting building sites. Ditching and land shaping help to overcome this limitation.

The sandy surface is a severe limitation affecting recreational uses. Suitable topsoil or other material should be added to improve trafficability.

The capability subclass is IIIw.

32—Kaliga muck. This very poorly drained soil is in marshes and swamps. Areas of this soil range from about 10 to several hundred acres. Slopes are smooth to concave and are less than 2 percent.

Typically, this soil has a black muck surface layer about 9 inches thick. The subsurface layer is dark reddish brown muck to a depth of about 30 inches. The underlying material is very dark gray loam to a depth of about 55 inches, dark gray sandy loam to a depth of about 70 inches, and light gray sand to a depth of 80 inches.

Included with this soil in mapping are small areas of Hontoon, Samsula, and Placid soils. Also included are a few areas of Kaliga, Samsula, and Hontoon soils that have been drained. Placid soils are sandy. Hontoon and Samsula soils are similar to the Kaliga soil. The included soils make up 15 to 25 percent of the map unit.

Unless this Kaliga soil is drained, it has a seasonal high water table at the surface or is ponded except during extended dry periods. Areas on flood plains are

Figure 6.—Subsidence of Kaliga muck leaves tree roots exposed above the present ground surface.

subject to frequent flooding as well as to ponding. The available water capacity is very high. Permeability is slow or very slow.

Most areas of this soil are in natural vegetation and provide wildlife habitat and water storage. The natural vegetation is mostly sweetbay, cypress, blackgum, Carolina ash, and red maple with an understory of sawgrass, lilies, reeds, sedges, and waxmyrtle. A few drained areas are used for pasture or sod.

Unless this soil is drained, it is not suited to cultivated crops. If water control is adequate, this soil is well suited to most vegetable crops. A well designed and maintained water-control system should remove excess water when crops are on the land and keep the soil saturated with water at all other times.

This soil is not suited to citrus.

Most improved grasses and clover grow well if water is properly controlled. Water control should maintain the water table near the surface to prevent oxidation of the organic layers (fig. 6).

Typically, the Freshwater Marshes and Ponds range site includes areas of this soil. The dominant vegetation is an open expanse of grasses, sedges, rushes, and other herbaceous plants in areas where the soil generally is saturated or covered with water for at least 2 months during the year. If good grazing management practices are used, this range site has the potential to produce more forage than any of the other range sites. Chalky bluestem and blue maidencane dominate the drier parts of the range site, and maidencane is dominant in the wetter parts. Other desirable forage includes cutgrass, bluejoint panicum, sloughgrass, and low panicums. Periodic high water levels provide a much needed natural deferment from overgrazing. If excessive grazing occurs, common carpetgrass, an introduced plant, tends to dominate the drier parts of the site.

This soil is not suited to pine tree production or to urban uses.

The capability subclass is VIIw.

33—Holopaw fine sand, depressional. This very poorly drained soil is in wet depressions on flatwoods. Areas of this soil range from 5 to over 100 acres. Slopes are smooth to concave and are 0 to 2 percent.

Typically, this soil has a very dark gray fine sand surface layer about 6 inches thick. The subsurface layer to a depth of about 41 inches is light brownish gray to grayish brown fine sand. The subsoil is light gray sandy clay loam to a depth of about 65 inches. The underlying material is gray loamy sand.

Included with this soil in mapping are small areas of Basinger, Felda, and Floridana soils. Basinger soils do not have a loamy subsoil. Felda and Floridana soils are similar to the Holopaw soil. The included soils make up

Figure 7.—Cypress trees are the dominant vegetation on Holopaw fine sand, depressional.

about 20 to 40 percent of the map unit.

This Holopaw soil is ponded for more than 6 months during most years. The available water capacity is low. Permeability is moderately slow in the subsoil.

Most of the acreage of this soil is rangeland or woodland. A few areas that have adequate water control are used for truck crops. The natural vegetation is dominantly cypress (fig. 7) with a few scattered slash pine and cabbage palm. The understory plants include waxmyrtle, sand cordgrass, and maidencane.

This soil is not suited to cultivated crops, planted pine trees, or pasture unless extensive drainage is provided.

Typically, the Freshwater Marshes and Ponds range site includes areas of this soil. The dominant vegetation is an open expanse of grasses, sedges, rushes, and other herbaceous plants in an area where the soil generally is saturated or covered with water for at least 2 months during the year. If good grazing management practices are used, this range site has the potential to produce more forage than any of the other range sites. Chalky bluestem and blue maidencane dominate the drier parts of the range site, and maidencane is dominant in the wetter parts. Other desirable forage includes cutgrass, bluejoint panicum, sloughgrass, and low panicums. Periodic high water levels provide a much needed natural deferment from overgrazing. If excessive grazing occurs, common carpetgrass, an introduced plant, tends to dominate the drier parts of the site.

This soil is severely limited as a site for all urban and recreational uses because of the ponding. Drainage and large amounts of fill material are needed. Most areas do not have suitable outlets for excess water.

The capability subclass is VIIw.

34—Anclote mucky fine sand, depressional. This very poorly drained soil is in depressions mostly bordering lakes throughout the county. Most areas are 3 to 100 acres. Slopes are smooth to concave and are 0 to 2 percent.

Typically, the surface layer of this soil is black mucky fine sand to a depth of about 8 inches and very dark gray fine sand to a depth of about 18 inches. The underlying material is gray fine sand to a depth of about 60 inches and dark gray fine sand to a depth of at least 80 inches.

Included with this soil in mapping are small areas of Basinger, Floridana, and Samsula soils. Also included are areas of soils that are similar to the Anclote soil except they have as much as 10 inches of muck on the surface. Floridana soils have a loamy subsoil. Samsula soils are organic. Basinger soils are similar to the Anclote soil. The included soils make up about 15 to 30 percent of the map unit.

This Anclote soil is ponded for at least 6 months during most years. The available water capacity is low. Permeability is rapid.

Most of the acreage of this soil is rangeland or woodland. The natural vegetation is cypress, bay, Carolina ash, scattered cabbage palm, maple, and rushes.

Unless this soil is drained, it is too wet to be used for cultivated crops or pasture. Drainage outlets need to be located before drainage can be applied.

This soil is not suited to citrus.

Typically, the Freshwater Marshes and Ponds range site includes areas of this soil. The dominant vegetation is an open expanse of grasses, sedges, rushes, and other herbaceous plants in areas where the soil generally is saturated or covered with water for at least 2 months during the year. If good grazing management practices are used, this range site has the potential to produce more forage than any of the other range sites. Chalky bluestem and blue maidencane dominate the drier parts of the range site, and maidencane is dominant in the wetter parts. Other desirable forage includes cutgrass, bluejoint panicum, sloughgrass, and low panicums. Periodic high water levels provide a much needed natural deferment from overgrazing. If excessive grazing occurs, common carpetgrass, an introduced plant, tends to dominate the drier parts of the site.

This soil generally is not used for the commercial production of pine trees, and the potential productivity is high only if surface drainage is developed. The major concerns in management are seedling mortality and the equipment use limitation caused by the wetness.

This soil is severely limited as a site for most urban uses because of the ponding. The high water table interferes with proper functioning of septic tank absorption fields, sewage lagoons, and sanitary landfills. The ponding is a severe limitation affecting sites for buildings and local roads and streets. Water outlets generally are not available. Fill material can be used to increase the effective depth to the water table.

The ponding is a severe limitation affecting recreational uses. It is difficult to overcome because areas of this soil generally are in depressions. In areas that are made suitable, topsoil or suitable fill material must be added to improve trafficability.

The capability subclass is VIIw.

35—Hontoon muck. This very poorly drained soil is in swamps and marshes. Areas of this soil range from 5 to several hundred acres. Slopes are dominantly less than 1 percent but range from 0 to 2 percent.

Typically, this soil is black muck to a depth of about 11 inches and dark brown muck to a depth of about 75 inches. The underlying material is black sandy loam to a depth of at least 80 inches.

Included with this soil in mapping are small areas of Kaliga, Placid, and Samsula soils and some soils that are similar to the Hontoon soil except they have less decomposed organic matter. Placid soils are sandy. Kaliga and Samsula soils are similar to the Hontoon soil. The included soils make up about 15 to 30 percent of the map unit.

This Hontoon soil has a seasonal high water table that is at or above the surface except during extended dry periods. Areas on flood plains are subject to frequent flooding as well as to ponding. The available water capacity is very high. Permeability is rapid.

Most of the acreage of this soil is in natural vegetation and provides wildlife habitat and water storage. The natural vegetation is redbay, white bay, red maple, blackgum, and cypress with a ground cover of sawgrass, lilies, reeds, ferns, greenbrier, and other aquatic plants.

Wetness is a very severe limitation affecting cultivated crops. If water control is adequate, excellent vegetable crops can be grown. A well designed and maintained water-control system must remove excess water when crops are growing and keep the soil saturated at other times. Crops respond well to fertilizer. Water-tolerant cover crops can be grown when row crops are not planted. To improve the soil, all crop residue and cover crops should be incorporated into the soil.

This soil is not suited to citrus because of the high water table and low strength.

In its natural state, this soil is poorly suited to pasture. Improved pasture grasses and clover do well only if a well designed water-control system is installed. The water table should be maintained near the surface to prevent excessive oxidation of organic matter. Fertilizer high in potash, phosphorus, and minor elements is needed to maintain plant vigor. Lime should be used to maintain a proper pH.

Typically, the Freshwater Marshes and Ponds range site includes areas of this soil. The dominant vegetation is an open expanse of grasses, sedges, rushes, and other herbaceous plants in an area where the soil generally is saturated or covered with water for at least 2 months during the year. If good grazing management practices are used, this range site has the potential to produce more forage than any of the other range sites. Chalky bluestem and blue maidencane dominate the drier parts of the range site, and maidencane is dominant in the wetter parts. Other desirable forage includes cutgrass, bluejoint panicum, sloughgrass, and low panicums. Periodic high water levels provide a much needed natural deferment from overgrazing. If excessive grazing occurs, common carpetgrass, an introduced plant, tends to dominate the drier parts of the site.

This soil is not suited to pine trees.

This soil has very severe limitations affecting urban and recreational uses because of the ponding and low strength.

The capability subclass is VIIw.

36—Basinger mucky fine sand, depressional. This very poorly drained soil is in wet depressions on flatwoods. Areas of this soil range from about 4 to 25 acres. Slopes are smooth to convex and are 0 to 2 percent.

Typically, this soil has a very dark gray mucky fine sand surface layer about 7 inches thick. The subsurface layer is light gray fine sand to a depth of about 35 inches. The subsoil is a mixture of grayish brown and very dark grayish brown fine sand to a depth of about 45 inches. The underlying material is brown fine sand to a depth of at least 80 inches.

Included with this soil in mapping are small areas of Placid, Pompano, St. Johns, and Samsula soils. Samsula soils are organic. Placid, Pompano, and St. Johns soils are similar to the Basinger soil. Also included are soils that are similar to the Basinger soil except they have a loamy sand or sandy loam subsoil. The included soils make up 15 to 20 percent of the map unit.

This Basinger soil is ponded for more than 6 months during most years. The available water capacity is low. Permeability is rapid.

Most of the acreage of this soil is in natural vegetation of broomsedge bluestem, chalky bluestem, maidencane, cutgrass, St. Johnswort, pineland threeawn, cypress, and other water-tolerant trees.

This soil is not suited to cultivated crops, citrus, or improved pasture because of the ponding.

Typically, the Freshwater Marshes and Ponds range site includes areas of this soil. The dominant vegetation is an open expanse of grasses, sedges, rushes, and other herbaceous plants in areas where the soil generally is saturated or covered with water for at least 2 months during the year. If good grazing management practices are used, this range site has the potential to produce more forage than any of the other range sites. Chalky bluestem and blue maidencane dominate the drier parts of the range site, and maidencane is dominant in the wetter parts. Other desirable forage includes cutgrass, bluejoint panicum, sloughgrass, and low panicums. Periodic high water levels provide a much needed natural deferment from overgrazing. If excessive grazing occurs, common carpetgrass, an introduced plant, tends to dominate the drier parts of the range site.

This soil generally is not used for the commercial production of pine trees. The potential productivity is moderate only if surface drainage is developed. The major management concerns, caused by the high water table, are the severe equipment use limitation and seedling mortality.

This soil is severely limited as a site for most urban and recreational uses because of the ponding. The high water table interferes with proper functioning of septic tank absorption fields, sewage lagoons, and sanitary landfills. The ponding is a severe limitation affecting sites for buildings and local roads and streets. Drainage outlets generally are not available. Fill material can be used to increase the effective depth to the water table.

The capability subclass is VIIw.

37—Placid fine sand, frequently flooded. This very poorly drained soil is on narrow flood plains. Areas of this soil range from 30 to several hundred acres. Slopes are smooth to concave and are 0 to 2 percent.

Typically, this soil has a black fine sand surface layer about 18 inches thick. The underlying material is dark gray fine sand to a depth of about 28 inches, light gray fine sand to a depth of about 60 inches, and grayish brown fine sand to a depth of at least 80 inches.

Included with this soil in mapping are small areas of Adamsville, Anclote, Basinger, Holopaw, and Pompano soils. Also included are small areas of soils that have a shallow surface layer of organic material. Adamsville soils are somewhat poorly drained. Holopaw soils have a loamy subsoil. Anclote, Basinger, and Pompano soils are similar to the Placid soil. The included soils make up 15 to 20 percent of the map unit.

This Placid soil has a seasonal high water table within 12 inches of the surface for long periods. Most areas are flooded during the rainy season. The available water capacity is low. Permeability is rapid.

The natural vegetation is mostly scattered bay, sweetgum, water oak, laurel oak, red maple, and cypress and an understory of waxmyrtle, maidencane, St. Johnswort, and other water-tolerant grasses.

This soil is not suited to cultivated crops or pasture because of the flooding and the wetness. It also is not suited to citrus.

The potential productivity for pine trees is low. The major concerns in management are seedling mortality and the equipment use limitation caused by the wetness and the flooding. If water-control measures are used, slash pine and South Florida slash pine are the best trees to plant.

This soil has severe limitations affecting most urban and recreational uses because of the wetness and the flooding. Fill material and water control are required.

The capability subclass is VIw.

38—Electra fine sand. This somewhat poorly drained soil is on low ridges on flatwoods. Areas of this soil range from 5 to 100 acres. Slopes are smooth to convex and are 0 to 2 percent.

Typically, this soil has a dark gray fine sand surface layer about 6 inches thick. The subsurface layer to a depth of about 42 inches is light gray fine sand. The upper part of the subsoil is black fine sand to a depth of about 50 inches. The next layer to a depth of about 55 inches is brown fine sand. The lower part of the subsoil is gray sandy clay loam.

Included with this soil in mapping are small areas of Adamsville, Pomello, and Sparr soils. Adamsville soils do not have a subsoil. Pomello soils do not have a loamy subsoil. Sparr soils do not have a black sandy subsoil. The included soils make up 15 to 25 percent of the map unit.

This Electra soil has a seasonal high water table at a depth of 24 to 40 inches for 1 to 4 months during most years. The available water capacity is low. Permeability is slow or very slow in the lower part of the subsoil.

Most of the acreage of this soil is rangeland or woodland. A few areas are cleared for improved pasture. Some areas that have adequate water management are used for citrus. The natural vegetation is sand live oak, longleaf pine, slash pine, South Florida slash pine, sand pine, running oak, saw palmetto, chalky bluestem, and indiangrass.

This soil is not suited to cultivated crops. Droughtiness and rapid leaching of plant nutrients limit the choice of plants and reduce potential crop yields.

Even if good management practices are used, this soil is poorly suited to pasture and hay crops because of the droughtiness in the surface and subsurface layers. Grasses, such as bahiagrass, can be grown. They respond to fertilizer and lime. Grazing should be controlled to maintain plant vigor and a good ground cover.

Typically, the Sand Pine Scrub range site includes areas of this soil. The dominant vegetation is a fairly dense stand of sand pine with a dense understory of oak, saw palmetto, and other shrubs. Because of past timber management practices, sand pine is not on all sites. The droughtiness limits the potential for producing native forage. If good grazing management practices are used, this site has the potential to provide limited amounts of lopsided indiangrass, creeping bluestem, and switchgrass. Livestock generally do not use this range site if more productive sites are available. Summer shade, winter protection, and dry bedding ground during wet periods are provided on this range site.

The potential productivity for pine trees is moderate. Seedling mortality, the equipment use limitation, and plant competition are concerns in management. Slash pine and South Florida slash pine are the best trees to plant.

This soil has severe limitations affecting some urban uses because it is too wet during periods of heavy rainfall and too sandy during periods of drought. The high water table interferes with proper functioning of septic tank absorption fields. The high water table and seepage interfere with the proper functioning of sewage lagoons and sanitary landfills. Suitable fill material is needed to overcome the moderate limitations affecting sites for buildings and local roads and streets.

The sandy surface is a severe limitation affecting recreational uses. Suitable material needs to be added to improve trafficability.

The capability subclass is VIs.

39—Arents, clayey substratum. These moderately well drained to somewhat poorly drained soils are a result of phosphate or silica mining. Deflocculated clay is pumped into preshaped trenches or into a series of pits from which phosphate has been removed. The clay comes out as one separate after the phosphate pebbles, ore, and sand have been removed. It has a very high concentration of water and takes a very long time to dry out under natural conditions. After the clay is dry enough to support some vehicular traffic, a cap of soil material (Arents) is spread over the clay. Areas of these soils range from about 100 to 640 acres. Slopes are smooth to convex.

The color and thickness of these soils vary from one area to another. Typically, these soils are brown or yellowish brown to gray or white sand to a depth of 2 to 4 feet. Some areas have a very compacted mixture of sand and clay that is underlain by several feet of mottled gray or gleyed clay. Some of the more common colors are light gray, dark gray, pale green, and dark greenish gray.

Included in mapping are small areas of Hydraquents and Neilhurst soils and some areas of Arents that do not have a clayey substratum. Also included are small mounds that have slopes of more than 5 percent. The included soils make up 15 to 20 percent of the map unit.

In the Arents, the high water table, available water capacity, and permeability are variable. The high water table generally ranges from about 2 to 4 feet. The available water capacity generally is low in the surface layer and high in subsurface layer. Permeability is variable but generally rapid in the surface and very slow in the subsurface layer. Natural fertility generally is low but can range to medium.

Most areas of these soils are used for pasture. Onsite investigation is recommended before using these soils as sites for buildings, roadways, recreational areas, and other related activities.

This map unit is not suited to most common cultivated crops. Variability of the topsoil and low natural fertility are the main limitations. Special seedbed preparation and water management are needed.

These soils have not been used extensively for agronomic practices. Some experimental plots are being tested.

Neither a capability subclass nor a woodland ordination symbol has been assigned to this map unit.

40—Wauchula fine sand. This poorly drained soil is in low, broad areas on flatwoods. Areas of this soil range from 5 to 40 acres. Slopes are smooth to concave and are 0 to 2 percent.

Typically, this soil has a black fine sand surface layer about 7 inches thick. The subsurface layer is gray fine sand to a depth of about 18 inches. The upper part of the subsoil is organic-coated fine sand to a depth of about 26 inches. The next part to a depth of about 33 inches is dark grayish brown fine sand. The lower part of the subsoil is light brownish gray fine sandy loam to a depth of about 38 inches, light gray sandy clay loam to a depth of about 56 inches, and gray fine sandy loam to a depth of about 70 inches. The underlying material is gray fine sandy loam.

Included with this soil in mapping are small areas of Lynne, Myakka, and Pomona soils. Myakka soils do not have a loamy subsoil. Lynne and Pomona soils are similar to the Wauchula soil. The included soils make up 20 to 40 percent of the map unit.

This Wauchula soil has a seasonal high water table within a depth of 12 inches for 1 to 4 months during most years. The available water capacity is moderate. Permeability is slow in the lower part of the subsoil.

Most areas of this soil are rangeland or woodland. Some areas that have adequate water management are used for citrus, improved pasture, or truck crops. The natural vegetation is longleaf pine, slash pine, and South Florida slash pine and an understory of saw palmetto, gallberry, fetterbush lyonia, southern bayberry, and pineland threeawn.

Wetness is a severe limitation affecting cultivated crops. The number of suitable crops is very limited unless intensive water-control measures are used. If a water-control system is used, many kinds of flowers and vegetables can be grown. The system must remove excess water in wet periods and provide subsurface irrigation in dry periods. Good management also includes crop rotations that keep close-growing, soil-improving crops on the land at least two-thirds of the time. These crops and crop residue help to control soil blowing and to maintain organic matter content. Fertilizer and lime should be added according to the needs of the crop.

This soil generally is poorly suited to citrus because of the wetness. If properly drained, it is moderately suited to oranges and grapefruit. Drainage should remove excess water from the soil rapidly and maintain the water table at an effective depth. Citrus trees should be planted on beds. A ground cover of close-growing plants between the trees helps to control soil blowing when the soil is dry and water erosion during heavy rainfall. Regular applications of fertilizer and occasional applications of lime are needed. Highest yields require irrigation during periods of light rainfall.

This soil is well suited to pasture and hay crops, such as pangolagrass, bahiagrass, and clover. Simple drainage is needed to remove excess surface water in times of heavy rainfall. Fertilizer and lime are needed, and grazing should be carefully controlled to maintain healthy plants for highest yields.

Typically, the South Florida Flatwoods range site includes areas of this soil. The dominant vegetation is scattered pine trees with an understory of saw palmetto and grass. If good grazing management practices are used, this range site has the potential to produce significant amounts of creeping bluestem, lopsided indiangrass, chalky bluestem, and various panicums. If range deterioration occurs, saw palmetto and pineland threeawn are dominant.

The potential productivity for pine trees is moderately high. The major concerns in management are seedling mortality, plant competition, and the equipment use limitation during periods of heavy rainfall. South Florida slash pine and slash pine are the best trees to plant.

This soil is severely limited as a site for urban development because of the wetness during the rainy season. The high water table interferes with proper functioning of septic tank absorption fields. Absorption fields can be elevated by adding fill material. Special measures are needed to overcome the problems caused by the wetness on sites for buildings and local roads and streets. If adequate outlets are available, drainage can be installed to lower the effective depth of the high water table. Building sites and roadbeds can be elevated by adding fill material to increase the effective depth to the high water table.

The wetness and the sandy surface layer are severe limitations affecting recreational uses. The problems caused by the wetness can be overcome if a water-control system can be established to keep the high water table below a depth of about 2.5 feet. Suitable topsoil or pavement can be used to stabilize the surface in heavy traffic areas.

The capability subclass is IIIw.

41—St. Johns sand. This poorly drained soil is on low, broad flats and in sloughs on flatwoods. It is also on toe slopes in the ridge areas. Areas of this soil range from 5 to 50 acres. Slopes are smooth to concave and are 0 to 2 percent.

Typically, this soil has a black sand surface layer about 12 inches thick. The subsurface layer is gray sand to a depth of about 22 inches. The subsoil to a depth of about 65 inches is black, organic-coated sand that grades to very dark grayish brown. The underlying material is brown sand to a depth of at least 80 inches.

Included with this soil in mapping are small areas of Basinger, Ona, Placid, and Samsula soils. Also included are areas of soils that have a thin, organic surface layer and soils that have a mucky fine sand surface layer. Placid soils do not have a dark subsoil. Samsula soils are organic. Basinger and Ona soils are similar to the St. Johns soil. The included soils make up about 20 to 40 percent of the map unit.

This St. Johns soil has a seasonal high water table within 12 inches of the surface for 3 to 6 months during most years. The available water capacity is moderate. Permeability is moderate or moderately slow in the subsoil.

Most areas of this soil are rangeland or woodland. Some that have adequate water management are used for citrus, improved pasture, or specialty crops. The natural vegetation is mostly longleaf pine, slash pine, and South Florida slash pine and an understory of saw palmetto, gallberry, waxmyrtle, huckleberry, pineland threeawn, St. Johnswort, maidencane, and St. Peterswort. Cutthroat grass is in the seep positions at the base of the slopes.

This soil is very severely limited for cultivated crops unless intensive water-control measures are used. If a water-control system is used, many kinds of vegetables can be grown. The system must remove excess water in wet periods and provide irrigation in dry periods. Good management also includes crop rotations that keep close-growing, soil-improving crops on the land at least two-thirds of the time. These crops and crop residue help to protect the soil from erosion and to maintain organic matter content. Fertilizer and lime should be added according to the needs of the crop.

This soil generally is poorly suited to citrus. If properly drained, it is moderately well suited. Drainage must remove excess water from the soil rapidly and maintain the water table at an effective depth. Citrus trees should be planted on beds. A ground cover of close-growing plants between the trees helps to protect the soil from erosion by wind and water. Regular applications of fertilizer and occasional applications of lime are needed. For highest yields, irrigation is needed if water is readily available.

This soil is well suited to pastures of pangolagrass, improved bahiagrass, and white clover. Water-control measures are needed to remove excess surface water after heavy rainfall. Fertilizer and lime are needed, and grazing should be controlled to prevent overgrazing and weakening of the plants.

Typically, the Cutthroat Seep range site includes areas of this soil. Range plant production is moderate. Cutthroat grass normally makes up more than 50 percent of the range site, and creeping bluestem makes up about 10 percent. The period of grazing and the number of cows per acre should be considered in a good range management plan.

The potential productivity for pine trees is moderate. The major concerns in management are seedling mortality, plant competition, and the equipment use limitation during periods of heavy rainfall. South Florida slash pine and slash pine are the best trees to plant.

This soil is severely limited as a site for urban development because of the wetness during the rainy season. The high water table interferes with proper functioning of septic tank absorption fields. Adding fill material can help overcome this limitation. Special measures are required to overcome the wetness limitation on sites for buildings and local roads and streets. If adequate outlets are available, drainage helps to prevent the high water table from rising. Building sites and roadbeds can also be elevated by adding fill material to increase the effective depth to the high water table.

The wetness and the sandy surface are severe limitations affecting recreational uses. The problems caused by the wetness can be overcome if a water-control system is established. Suitable topsoil or pavement can be used to stabilize the surface in heavy traffic areas.

The capability subclass is IIIw.

42—Felda fine sand. This poorly drained soil is in sloughs or low hammocks on flatwoods. Areas of this soil are 3 to 100 acres. Slopes are smooth to concave and are 0 to 2 percent.

Typically, this soil has a very dark gray fine sand surface layer about 5 inches thick. The subsurface layer is light brownish gray and light gray fine sand to a depth of about 22 inches. The subsoil is gray sandy clay loam to a depth of about 45 inches and light gray sandy loam to a depth of about 50 inches. The underlying material is sandy loam to a depth of at least 80 inches. It is light gray in the upper part and pale green in the lower part.

Included with this soil in mapping are small areas of Bradenton, Floridana, Malabar, and Oldsmar soils. Bradenton soils have a loamy subsoil within 20 inches of the surface. In Malabar and Oldsmar soils, the subsoil is sandy material underlain by loamy material. Floridana soils are similar to the Felda soil. The included soils make up about 10 to 30 percent of the map unit.

This Felda soil has a seasonal high water table within 12 inches of the surface for 2 to 4 months during most years. In slough areas the surface is covered by shallow, slowly moving water for 1 to 7 or more days during periods of heavy rainfall. The available water capacity is low. Permeability is moderately rapid.

Most areas of this soil are in improved pasture. Some remain in natural vegetation that is mainly South Florida slash pine, slash pine, waxmyrtle, cabbage palm, pineland threeawn, and many grasses.

Wetness is a severe limitation affecting cultivated crops. If a well designed and managed water-control system is used, fruit and vegetable crops can be grown. The system must remove excess water rapidly and provide a means of applying subirrigation. Good soil management includes crop rotations that keep close-growing cover crops on the land at least two-thirds of the time. The cover crops and crop residue help to maintain organic matter content and reduce soil blowing. Seedbed preparation should include bedding. Fertilizer should be applied according to the needs of the crop.

If a proper water-control system is used, this soil is well suited to citrus. The system should maintain good drainage to an effective depth. Bedding of the land and planting the trees on the beds provide good surface drainage. A close-growing plant cover helps to protect the soil from erosion when the trees are young. Fertilizer and occasional applications of lime are needed.

This soil is well suited to pasture and hay crops, such as pangolagrass, bahiagrass, and clover. Excellent pastures of grass or grass-clover mixtures can be grown. Fertilizer and controlled grazing are needed for the highest yields.

Typically, the Slough range site includes areas of this soil. The dominant vegetation is an open expanse of grasses, sedges, and rushes in an area where the soil is saturated during the rainy season. If good grazing management practices are used, this range site has potential for forage production almost as high as that of the Freshwater Marshes and Ponds range site. Desirable forage includes blue maidencane, maidencane, chalky bluestem, toothachegrass, and Florida bluestem. If excessive grazing occurs, common carpetgrass, an introduced plant, is dominant.

The potential productivity for pine trees is moderately high. The major concerns in management are the equipment use limitation, seedling mortality, and plant competition. Bedding of rows helps in establishing seedlings and removing excess surface water. Slash pine and South Florida slash pine are the best trees to plant.

This soil is severely limited as a site for septic tank absorption fields, building sites, and local roads and streets. Special measures are required to overcome the excessive wetness. Septic tank absorption fields should be elevated by adding suitable fill material.

The excessive wetness is a severe limitation affecting recreational uses. Water-control measures that keep the seasonal high water table below a depth of about 2.5 feet are required. Suitable topsoil or pavement can be used to stabilize the surface in heavy traffic areas.

The capability subclass is IIIw.

43—Oldsmar fine sand. This poorly drained soil is in broad areas on flatwoods. Areas of this soil range from 10 to 80 acres. Slopes are smooth and convex and are 0 to 2 percent.

Typically, this soil has a dark gray fine sand surface layer about 6 inches thick. The subsurface layer is gray fine sand to a depth of about 36 inches. The subsoil to a depth of about 50 inches is black and dark reddish brown fine sand that is coated with organic matter. It is mottled sandy clay loam to a depth of 80 inches.

Included with this soil in mapping are areas of EauGallie, Immokalee, Myakka, and Smyrna soils. Immokalee, Myakka, and Smyrna soils do not have a loamy subsoil. EauGallie soils are similar to the Oldsmar soil. The included soils make up about 10 to 20 percent of the map unit.

This Oldsmar soil has a seasonal high water table within 12 inches of the surface for 1 to 4 months during most years and at a depth of 12 to 40 inches for more than 6 months. The high water table recedes to a depth of more than 40 inches during extended dry periods. The available water capacity is low. Permeability is slow or very slow in the loamy subsoil.

Most areas of this soil are used as rangeland or woodland. Some that have adequate water management are used for citrus, improved pasture, or truck crops. The natural vegetation is mostly live oak, laurel oak, slash pine, South Florida slash pine, longleaf pine, and cabbage palm and an understory of waxmyrtle, saw palmetto, and pineland threeawn.

Wetness and droughtiness are very severe limitations affecting cultivated crops. The number of suitable crops is limited unless very intensive management practices are followed. If good water-control and soil-improving measures are used, some vegetable crops can be grown. The water-control system must remove excess water in wet periods and provide water for irrigation in dry periods. Crop rotations should keep close-growing, soil-improving crops on the land three-fourths of the time. Crop residue and soil-improving crops help to control soil blowing and to maintain organic matter content. Seedbed preparation should include bedding of the rows. Fertilizer should be added according to the needs of the crop.

Unless very intensive management practices are used, this soil is poorly suited to citrus. In areas subject to frequent freezing, it is not suited. Citrus crops can be grown only if a water-control system is used that maintains the water table at an effective depth. Citrus trees should be planted on beds, and a plant cover should be maintained between the trees. Fertilizer and lime are needed.

This soil is well suited to pastures of pangolagrass, improved bahiagrass, and white clover. Water-control measures are needed to remove excess surface water after heavy rainfall. Fertilizer is needed, and grazing should be controlled to prevent overgrazing and weakening of the plants.

Typically, the South Florida Flatwoods range site includes areas of this soil. The dominant vegetation is scattered pine trees with an understory of saw palmetto and grass. Cabbage palms are in some areas. If good grazing management practices are used, this range site has the potential to produce significant amounts of broomsedge bluestem, toothachegrass, and various panicums. If range deterioration occurs, saw palmetto and pineland threeawn are dominant.

The potential productivity for pine trees is moderately high. The major concerns in management are the equipment use limitation, seedling mortality, and plant competition. South Florida slash pine and slash pine are the best trees to plant.

This soil is severely limited as a site for urban development because of the wetness during the rainy season. The high water table interferes with the proper functioning of septic tank absorption fields. The septic tank absorption fields can be elevated by adding fill material. Special measures are needed to overcome problems caused by wetness on sites used for buildings and for local roads and streets. If adequate outlets are available, drainage helps to keep the high water table below a depth of 2.5 feet. Building sites and roadbeds can also be elevated by adding fill material to increase the effective depth to the high water table.

The wetness and the sandy surface are severe limitations affecting recreational uses. The problems caused by the wetness can be overcome if a water-control system is used to keep the high water table below a depth of about 2.5 feet. Suitable topsoil or pavement can be used to stabilize the surface in heavy traffic areas.

The capability subclass is IVw.

44—Paisley fine sand. This poorly drained soil is on low, broad flatwoods. Areas of this soil range from about 20 to 160 acres. Slopes are smooth and are 0 to 2 percent.

Typically, this soil has a very dark gray fine sand surface layer about 3 inches thick. The subsurface layer to a depth of about 14 inches is grayish brown fine sand that grades to gray. The subsoil is gray sandy clay to a depth of about 48 inches. The underlying material is light gray sandy clay to a depth of at least 80 inches.

Included with this soil in mapping are small areas of Bradenton, Felda, and Wabasso soils. Felda soils are sandy to a depth of at least 20 inches. Wabasso soils have a dark subsoil. Bradenton soils are similar to the Paisley soil. The included soils make up 15 to 20 percent of the map unit.

This Paisley soil has a seasonal high water table within a depth of 12 inches for 1 to 4 months during most years. The available water capacity is moderate. Permeability is slow in the subsoil.

Most areas of this soil are used as rangeland or woodland, and many have been cleared for improved pasture. Some areas that have adequate water management are used for truck crops. The natural vegetation is mostly slash pine, South Florida slash pine, live oak, cabbage palm, and sweetgum with an understory of waxmyrtle, bluestem, and other grasses.

Wetness and the slow permeability are very severe limitations affecting cultivated crops. The number of suitable crops is limited unless very intensive soil management practices are used. If good water-control and soil-improving measures are used, vegetable crops can be grown. A water-control system must remove excess water in wet periods and provide water in dry periods. Crop rotations should keep close-growing, soil-improving crops on the land three-fourths of the time. Crop residue and soil-improving crops help to maintain organic matter content and protect the soil from erosion. Seedbed preparation should include bedding of the rows. Fertilizer and lime should be added according to the needs of the crop.

Unless very intensive management practices are used, this soil is poorly suited to citrus. It is suited only if a carefully designed water-control system is used. Citrus trees should be planted on beds, and a plant cover should be maintained between the trees. Fertilizer and lime are needed.

This soil is well suited to pastures of pangolagrass, improved bahiagrass, and white clover. Water-control measures are needed to remove excess surface water after heavy rainfall. Fertilizer and lime are needed, and grazing should be controlled to prevent overgrazing and weakening of the plants.

Typically, the South Florida Flatwoods range site includes areas of this soil. The dominant vegetation is scattered pine trees with an understory of saw palmetto and grass. If good grazing management practices are used, this range site has the potential to produce significant amounts of creeping bluestem, lopsided indiangrass, chalky bluestem, and various panicums. If range deterioration occurs, saw palmetto and wiregrass are dominant.

The potential productivity for pine trees is very high. The major concerns in management are seedling mortality, plant competition, windthrow hazard, and the equipment use limitation when the soil is saturated during periods of heavy rainfall. Slash pine and South Florida slash pine are the best trees to plant.

This soil is severely limited as a site for urban development because of the wetness during the rainy season. The high water table and the slow permeability interfere with proper functioning of septic tank absorption fields. Absorption fields can be elevated by adding suitable fill material. Special measures are needed to overcome the problems caused by the wetness and the high shrink-swell potential on sites for buildings and local roads and streets. If adequate outlets are available, drainage can lower the depth to the high water table. Building sites and roadbeds can be elevated by adding material to increase the effective depth to the high water table.

The wetness and the sandy surface layer are severe limitations affecting recreational uses. The problems caused by the wetness can be overcome by a drainage system that keeps the high water table below a depth of about 2.5 feet. Suitable topsoil or pavement can be used to stabilize the surface in heavy traffic areas.

The capability subclass is IIIw.

46—Astatula sand, 0 to 8 percent slopes. This excessively drained soil is on sandy upland ridges. Areas of this soil range from 20 to more than 10,000 acres.

Typically, this soil has a dark gray sand surface layer about 7 inches thick. The underlying material to a depth of at least 80 inches is light yellowish brown sand that grades to very pale brown.

Included with this soil in mapping are small areas of

Candler and Tavares soils. These soils are similar to the Astatula soil. They make up less than 15 percent of the map unit.

This Astatula soil does not have a water table within a depth of 72 inches. The available water capacity is very low. Permeability is very rapid.

Most of the acreage of this soil is used for citrus or improved pasture. The natural vegetation is bluejack oak, turkey oak, longleaf pine, sand pine, Rosemary, pineland threeawn, bluestem, and paspalum.

This soil is not suited to most cultivated crops and citrus because of droughtiness and the rapid leaching of plant nutrients. If irrigation is used, high yields of citrus can be obtained. Fertilizer and lime should be applied according to the needs of the crop.

This soil is poorly suited to pasture and hay crops; however, grasses, such as pangolagrass and bahiagrass, can be grown.

Typically, the Longleaf Pine-Turkey Oak Hills range site includes areas of this soil. The dominant vegetation is longleaf pine and turkey oak. Forage production and quality are poor, and cattle do not readily use this range site if other sites are available. Desirable forage includes creeping bluestem, lopsided indiangrass, and low panicums.

The potential productivity for pine trees is low. The major concerns in management, caused by droughtiness and sandiness, are the equipment use limitation and seedling mortality. Sand pine is the best tree to plant.

This soil has only slight limitations affecting most urban uses. Because of poor filtration, however, ground water contamination is a hazard in areas that have a concentration of homes with septic tanks. Seepage is a severe limitation affecting sanitary landfills. Landfill trenches should be sealed. The slope is a moderate limitation affecting sites for small commercial buildings.

The sandy surface causes poor trafficability in recreational areas. Suitable topsoil or some form of surfacing can reduce or overcome this limitation. Slope is a severe limitation affecting playgrounds.

The capability subclass is VIs.

47—Zolfo fine sand. This somewhat poorly drained soil is on low, broad ridges and knolls on flatwoods. Areas of this soil range from 10 to 150 acres. Slopes are smooth to concave and are 0 to 2 percent.

Typically, this soil has a very dark gray fine sand surface layer about 7 inches thick. The subsurface layer is fine sand. It is brown to pale brown to a depth of about 30 inches and light gray to a depth of about 67 inches. The next layer to a depth of about 71 inches is brown fine sand. The subsoil to a depth of at least 80 inches is dark reddish brown fine sand that is coated with organic matter.

Included with this soil in mapping are small areas of Adamsville, Immokalee, Pomello, and Tavares soils. Adamsville and Tavares soils do not have a dark subsoil. Immokalee soils are poorly drained. Pomello soils are similar to the Zolfo soil. The included soils make up about 5 to 15 percent of the map unit.

This Zolfo soil has a seasonal high water table at a depth of 24 to 40 inches for 2 to 6 months during most years and at a depth of 10 to 24 inches for up to 2 weeks in some years. The available water capacity is low. Permeability is moderate in the subsoil.

Most areas of this soil are in citrus. Some remain in natural vegetation that is mostly scattered turkey oak, laurel oak, water oak, longleaf pine, South Florida slash pine, and slash pine with an undercover of pineland threeawn, bluestem, lopsided indiangrass, gallberry, and saw palmetto.

Seasonal wetness and droughtiness are severe limitations affecting cultivated crops. The number of suitable crops is limited. A complete water-control system is recommended for most crops. If such a system is installed and maintained, many fruit and vegetable crops can be grown. The system should remove excess water rapidly and provide a means of applying irrigation. Good soil management also includes close-growing cover crops in the crop rotation. Crop residue should be used to control soil blowing and to maintain organic matter content. Good seedbed preparation includes bedding. Fertilizer and lime should be added according to the needs of the crop.

In places that are relatively free from freezing temperatures, this soil is well suited to citrus. A water-control system is needed to maintain the high water table at an effective depth. A ground cover of close-growing plants should be maintained between the trees to control soil blowing in dry weather and water erosion during heavy rainfall. Good yields of oranges and grapefruit generally can be obtained without irrigation; however, increased yields can be expected if irrigation is used during drier periods. Fertilizer and lime are needed.

This soil is well suited to pasture and hay crops. Deep-rooted plants, such as coastal bermudagrass and bahiagrass, grow well if fertilizer and lime are used. Production is occasionally restricted by extended drought. Grazing should be controlled to maintain plant vigor and good ground cover.

A range site is not given for this soil because most of the acreage is in citrus.

The potential productivity for pine trees is moderately high. The equipment limitation, seedling mortality, and plant competition are concerns in management. Slash pine and South Florida slash pine are the best trees to plant.

This soil is severely limited as a site for septic tank absorption fields because of the wetness and a poor filtering capacity. Adding suitable fill material to elevate the absorption field helps to overcome these limitations. Seepage is a severe limitation affecting sewage lagoons and sanitary landfills. The sidewalls and bottom of lagoons and landfills should be sealed. The wetness is a moderate limitation affecting sites for dwellings without basements, small commercial buildings, and local roads and streets.

The sandy texture is a severe limitation affecting recreational uses. Suitable topsoil or pavement can be used to stabilize the surface in heavy traffic areas.

The capability subclass is IIIw.

48—Chobee fine sandy loam, depressional. This very poorly drained soil is in wet depressions on flatwoods. Areas of this soil range from 5 to 100 acres. Slopes are smooth to concave and are 0 to 2 percent.

Typically, this soil has a black fine sandy loam surface layer about 12 inches thick. The subsoil to a depth of about 55 inches is black sandy clay loam that grades to very dark gray and gray. The underlying material is gray fine sand to a depth of at least 80 inches.

Included with this soil in mapping are small areas of Eaton, Floridana, and Nittaw soils. Also included are soils similar to the Chobee soil except they have a muck surface layer that is as much as 4 inches thick. Eaton and Floridana soils are sandy to a depth of 20 to 40 inches. Nittaw soils are similar to the Chobee soil. The included soils make up 15 to 20 percent of the map unit.

This Chobee soil is ponded for more than 6 months during most years. The available water capacity is moderate. Permeability is slow or very slow in the subsoil.

Most of the acreage of this soil is in natural vegetation that is mostly pickerelweed, lilies, sawgrass, scattered red maple, cypress, bay, blackgum, and ash.

This soil is not suited to cultivated crops, citrus, or improved pasture because of the ponding. Drainage outlets need to be located before drainage can be applied.

Typically, the Freshwater Marshes and Ponds range site includes areas of this soil. The dominant vegetation is an open expanse of grasses, sedges, rushes, and other herbaceous plants in areas where the soil generally is saturated or covered with water for at least 2 months during the year. If good grazing management practices are used, this range site has the potential to produce more forage than any of the other range sites. Chalky bluestem and blue maidencane dominate the drier parts of the site, and maidencane is dominant in the wetter parts. Other desirable forage includes cutgrass, bluejoint panicum, sloughgrass, and low panicums. Periodic high water levels provide a much needed natural deferment from overgrazing. If excessive grazing occurs, common carpetgrass, an introduced plant, tends to dominate the drier parts of the site.

This soil is not used for commercial production of pine trees. The potential productivity for pine trees is moderate only if surface drainage is improved. The major concerns in management, caused by a high water table, are the severe equipment use limitation and seedling mortality.

This soil is severely limited as a site for most urban and recreational uses because of the ponding. The high water table interferes with proper functioning of septic tank absorption fields, sewage lagoons, and sanitary landfills. Drainage outlets generally are not available.

The capability subclass is VIIw.

49—Adamsville-Urban land complex. This map unit consists of areas of somewhat poorly drained Adamsville soil and Urban land. The individual areas of Adamsville soil and Urban land are so small and intermixed that mapping them separately at the selected scale was not practical. Individual areas are somewhat rectangular. Slopes generally are smooth and are 0 to 2 percent.

The Adamsville soil makes up about 50 to 75 percent of the map unit. Typically, it has a very dark gray fine sand surface layer about 6 inches thick. The underlying material to a depth of at least 80 inches is light yellowish brown fine sand that grades to very pale brown.

Under natural conditions this Adamsville soil has a seasonal high water table at a depth of 20 to 40 inches for 2 to 6 months during most years and at a depth of 10 to 20 inches for as long as 2 weeks in some years. The available water capacity is low. Permeability is rapid.

The Urban land makes up about 20 to 45 percent of the map unit. It is covered by streets, driveways, houses and other buildings, parking lots, and other similar structures.

Included in mapping are small areas of Tavares and

Satellite soils. These soils are similar to the Adamsville soil. They make up 15 to 20 percent of the map unit.

Present development precludes the use of this Adamsville soil for crops, pasture, or pine tree production.

Neither a capability subclass nor a woodland ordination symbol has been assigned to this map unit.

50—Candler-Urban land complex, 0 to 5 percent slopes. This map unit consists of areas of excessively drained Candler soil and Urban land. The individual areas of Candler soil and Urban land are so small and intermixed that mapping them separately at the selected scale is not practical. Areas of this map unit are somewhat rectangular.

The Candler soil makes up about 45 to 65 percent of the map unit. Typically, this soil has a dark brown fine sand surface layer about 6 inches thick. The subsurface layer to a depth of about 63 inches is brownish yellow sand that grades to yellow. The underlying material to a depth of at least 80 inches is yellow sand that has very thin, strong brown lamellae.

This Candler soil does not have a high water table within a depth of 80 inches. The available water capacity is very low, and permeability is rapid.

The Urban land makes up about 20 to 45 percent of the map unit. It is covered by streets, driveways, houses and other buildings, parking lots, and other similar structures.

Included in mapping are areas of other sandy soils. The included soils make up as much as 20 percent of the map unit.

Present development precludes the use of this Candler soil for crops, pasture, or pine tree production.

Neither a capability subclass nor a woodland ordination symbol has been assigned to this map unit.

51—Pomona-Urban land complex. This map unit consists of areas of poorly drained Pomona soil and Urban land. The individual areas of Pomona soil and Urban land are so small and intermixed that mapping them separately at the selected scale is not practical. The areas are somewhat rectangular. Slopes generally are smooth and are 0 to 2 percent.

The Pomona soil makes up about 50 to 75 percent of the map unit. Typically, it has a dark gray fine sand surface layer about 6 inches thick. The subsurface layer is sand to a depth of about 21 inches. It is light brownish gray in the upper part and light gray in the lower part. The upper part of the subsoil to a depth of about 26 inches is dark reddish brown loamy fine sand. The next layer is very pale brown and light gray fine sand to a depth of about 48 inches. The lower part of the subsoil is light gray fine sandy loam to a depth of about 60 inches and light gray sandy clay loam to a depth of about 73 inches. The underlying material is light gray loamy sand to a depth of at least 80 inches.

Under natural conditions this Pomona soil has a seasonal high water table within 12 inches of the surface for 1 to 4 months during most years. Most areas have had some drainage installed. The available water capacity is low. Permeability is moderate or moderately slow in the lower part of the subsoil.

The Urban land makes up about 20 to 45 percent of the map unit. It is covered by streets, parking lots, buildings, and other structures that obscure or alter the soil. Uncovered areas are mainly lawns, vacant lots, or playgrounds.

Included in mapping are small areas of Myakka, Immokalee, and Wauchula soils. Myakka and Immokalee soils do not have a loamy subsoil. Wauchula soils are similar to the Pomona soil. The included soils make up 5 to 15 percent of the map unit.

Present development precludes the use of this Pomona soil for crops, pasture, or pine tree production.

Neither a capability subclass nor woodland ordination symbol has been assigned to this map unit.

53—Myakka-Immokalee-Urban land complex. This map unit consists of poorly drained Myakka and Immokalee soils and Urban land. The individual areas of these soils and Urban land are so intermixed that mapping them separately at the selected scale is not practical. Areas of these soils are somewhat rectangular. Slopes generally are smooth and are 0 to 2 percent.

The Myakka soil makes up about 25 to 50 percent of the map unit. Typically, it has a very dark gray fine sand surface layer about 7 inches thick. It has a salt-and-pepper appearance when dry. The subsurface layer is gray fine sand to a depth of about 25 inches. The subsoil is black fine sand to a depth of about 30 inches and dark brown fine sand to a depth of about 36 inches. The underlying material is yellowish brown fine sand to a depth of at least 80 inches.

The Immokalee soil makes up about 20 to 35 percent of the map unit. Typically, it has a very dark gray sand surface layer about 7 inches thick. The subsurface layer to a depth of about 39 inches is light gray sand that grades to white. The subsoil is black sand to a depth of about 58 inches, gray sand to a depth of about 66 inches, very dark gray sand to a depth of about 75 inches, and black sand to a depth of at least 80 inches.

Under natural conditions the Myakka and Immokalee soils have a seasonal high water table within 12 inches of the surface for 1 to 4 months in most years. Some areas have been drained to various depths. The available water capacity is low. Permeability is moderate or moderately rapid in the subsoil.

The Urban land makes up about 20 to 45 percent of the map unit. It is covered by streets, driveways, houses and other buildings, parking lots, and other similar structures.

Included in mapping are areas of Basinger, Ona, Pomello, and Pomona soils. Pomona soils have a loamy subsoil and are moderately well drained. Basinger and Ona soils are similar to the Myakka and Immokalee soils. The included soils make up 7 to 15 percent of the map unit.

Present development precludes the use of the Myakka and Immokalee soils for crops, pasture, or pine tree production.

Neither a capability subclass nor woodland ordination symbol has been assigned to this map unit.

54—Pomello-Urban land complex. This map unit consists of moderately well drained Pomello soil and Urban land. The individual areas of Pomello soil and Urban land are so intermixed that mapping them separately at the selected scale is not practical. Individual areas are somewhat rectangular. Slopes generally are smooth to convex and are 0 to 2 percent.

The Pomello soil makes up about 50 to 70 percent of the map unit. In places it has been reworked or reshaped but is still recognizable as Pomello soil. Typically, it has a dark gray fine sand surface layer about 5 inches thick. The subsurface layer is white fine sand to a depth of about 48 inches. The subsoil to a depth of about 53 inches is dark reddish brown fine sand that is coated with organic matter. To a depth of about 63 inches it is black fine sand that is coated with organic matter. The underlying material is dark brown fine sand to a depth of at least 80 inches.

Under natural conditions this Pomello soil has a seasonal high water table at a depth of about 24 to 40 inches for about 1 to 4 months during most years. The available water capacity is low. Permeability is moderately rapid in the subsoil.

The Urban land makes up about 20 to 45 percent of this map unit. This land is covered by streets, parking lots, buildings, and other structures.

Included in mapping are areas of Immokalee, Satellite, and St. Johns soils. Immokalee and St. Johns soils are poorly drained. Satellite soils do not have a dark subsoil. The included soils make up 5 to 15 percent of the map unit.

Present development precludes the use of this Pomello soil for cultivated crops or improved pasture.

Neither a capability subclass or woodland ordination symbol has been assigned to this map unit.

55—Sparr-Urban land complex, 0 to 5 percent slopes. This map unit consists of somewhat poorly drained Sparr soil and Urban land. The individual areas of Sparr soil and Urban land are so small and intermixed that mapping them separately at the selected scale is not practical. The areas are somewhat rectangular.

The Sparr soil makes up about 45 to 65 percent of the map unit. Typically, it has a dark gray sand surface layer about 8 inches thick. The subsurface layer is brown to very pale brown sand to a depth of about 57 inches. The subsoil to a depth of at least 80 inches is very pale brown sandy clay loam that grades to light gray.

Under natural conditions this Sparr soil has a seasonal high water table at a depth of 20 to 40 inches for 1 to 4 months in most years. The available water capacity is low. Permeability is moderately slow or slow in the subsoil.

The Urban land makes up about 20 to 45 percent of the map unit. It is covered by streets, driveways, houses and other buildings, parking lots, and other similar structures.

Included in mapping are small areas of Apopka, Candler, Millhopper, and Tavares soils. Apopka soils are well drained. Candler and Tavares soils do not have a loamy subsoil. Millhopper soils are similar to the Sparr soil. The included soils make up 15 to 20 percent of the map unit.

Present development precludes the use of this Sparr soil for crops, pasture, or pine tree production.

Neither a capability subclass nor a woodland ordination symbol has been assigned to this map unit.

57—Haplaquents, clayey. These soils occur as areas of slime (colloidal clay), a by-product of phosphate mining. The slime has been pumped into holding ponds and allowed to dry. These holding ponds are built with a 30- to 40-foot dike surrounding them. They are designed so that water flows through a series of ponds before returning to an outlet stream. In older mined areas, the slime was pumped into open pits that did not have outlets. These areas have dried out, and a hard crust has formed on the surface. The more recent holding ponds are nearly level and vary in thickness from about 3 feet near the edge to more than 30 feet in the center. Areas range from 200 to 1,000 or more acres. Slopes generally are less than 1 percent.

Included in mapping are a few small areas of sand tailings; however, most of the holding ponds are pure slime.

Haplaquents, clayey (locally called "slickens"), are about 88 percent clay, 8 percent silt, and 4 percent sand. The clay is mainly montmorillonite but includes kaolinite, illite, and attapulgite. The soil material is gray and light gray with some yellowish brown mottles. It is neutral to moderately alkaline. The material generally is dry to a depth of 2 feet. Water ponds on the surface after heavy rainfall. The available water capacity is very high. Natural fertility is high, and the organic matter content is low. Permeability is very slow.

Low soil strength and wetness are the main limitations affecting most uses.

Most areas are now used for pasture.

The capability subclass is VIIw.

58—Udorthents, excavated. This map unit consists of excavated areas, locally called "borrow pits." The excavated soil and geologic material have been removed for use as fill or as base for roads. Included in mapping are areas of spoil around the edge of the pits. The spoil is mostly sand or clay. Areas of this map unit range from 5 to 40 acres.

This map unit has no agronomic use.

Neither a capability subclass nor a woodland ordination symbol has been assigned to this map unit.

59—Arents-Urban land complex, 0 to 5 percent slopes. This map unit consists of Urban land and areas of sandy material used as fill in urban areas. The Arents are somewhat poorly drained to moderately well drained, depending upon the underlying natural soil (which is poorly drained in most areas). Depth of the fill material varies from 30 to 60 inches. A small percentage of these soils, mostly those southwest of Lakeland, is reclaimed phosphate overburden that has been smoothed and leveled.

Arents do not have an orderly sequence of soil layers but are a mixture of lenses, streaks, and pockets, which vary within short distances. Typically, the surface layer is light gray sand to a depth of about 30 inches. The next layer is very pale brown sand to a depth of about 57 inches. Bodies of dark brown sandy clay loam are in this layer. Dark brown sand extends to a depth of at least 80 inches.

Included in mapping are small areas of natural soils, which do not have fill material. These soils make up less than 25 percent of the map unit.

Permeability is rapid in the Arents but varies with depth to the natural soil. The organic matter content and fertility are low. The high water table is within 60 inches of the surface for 2 to 6 months during most years.

Present development precludes the use of the Arents for cultivated crops, citrus, or improved pasture. Unless topsoil is spread over the surface to make a suitable root zone, these soils are poorly suited to lawn grasses and ornamental plants.

Neither a capability subclass nor a woodland ordination symbol has been assigned to this map unit.

60—Arents, sandy. This map unit consists of areas of sanitary landfills that have been excavated and backfilled with alternating layers of refuse and mixed soil material. The thickness of the refuse varies but generally is 2 to 4 feet. The refuse is covered daily with at least 6 inches of soil material, generally sand, bits and pieces of finer textured material, clay, and organic-coated sand. Individual areas of this map unit range from 50 to several hundred acres. Slopes generally are less than 2 percent; however, in places some mounds have slopes of more than 2 percent.

Typically, the Arents have variable layers of very dark grayish brown and gray sand or a sand mixture containing pieces of sandy loam to sandy clay loam to a depth of about 24 inches. The next layer is 24 to 48 inches of refuse. It is underlain by 6 inches of soil material, including sand, sandy loam, and sandy clay loam. Colors vary but include gray or dark gray. Alternate layers of refuse and soil material extend to a depth of at least 80 inches.

In the Arents, the high water table, available water capacity, and permeability are all variable. They are dependent upon the area and the final cover of soil material. Natural fertility is variable but generally is low.

Most areas of these soils are used for industrial and recreational parks. They are suited to these uses only after the areas have settled for at least 20 years. Onsite investigation is recommended before development of these areas.

These soils are not suited to cultivated crops or urban uses.

Neither a capability subclass nor a woodland ordination symbol has been assigned to this map unit.

61—Arents, organic substratum-Urban land complex. This map unit consists of Urban land and areas of somewhat poorly drained, sandy material underlain by organic soils. These areas are in former organic marshes and swamps, mainly around the edge of lakes. The unit has been developed for urban uses.

Slopes generally are less than 2 percent.

Typically, the Arents have a very dark grayish brown or black sand surface layer about 7 inches thick. The surface layer generally is sand or fine sand; however, because most of this material has been hauled in from other areas, color and stratification vary widely. The next layer to a depth of about 30 inches is light gray or grayish brown sand that has lenses of light gray and white sand. The underlying material is very dark grayish brown or black muck to a depth of about 65 inches and light gray sand to a depth of 80 inches.

Permeability is rapid. The available water capacity is low or very low in the sand layers and very high in the organic layer. The underlying organic material has low strength, and onsite investigation of the depth and thickness of this layer should be made before construction begins.

Arents in open areas, such as lawns or vacant lots, make up 50 to 75 percent of this map unit. Urban land, which includes streets, sidewalks, driveways, houses, and other structures, makes up 25 to 50 percent. These percentages vary from one area to another. Most areas have already been developed for urban uses, thus precluding the use of the Arents for agriculture.

Neither a capability subclass nor a woodland ordination symbol has been assigned to this map unit.

62—Wabasso fine sand. This poorly drained soil is on broad flatwoods. Areas of this soil are irregular in shape and are about 10 to 100 acres. Slopes are smooth and are 0 to 2 percent.

Typically, this soil has a very dark gray fine sand surface layer about 7 inches thick. The subsurface layer is light gray fine sand to a depth of about 22 inches. The subsoil to a depth of about 35 inches is dark brown fine sand that is coated with organic matter. It is gray sandy clay loam to a depth of about 51 inches and greenish gray fine sandy loam to a depth of about 67 inches. The underlying material is light greenish gray fine sandy loam to a depth of 80 inches.

Included with this soil in mapping are small areas of EauGallie, Felda, Floridana, Holopaw, Malabar, and Pomona soils. Felda, Floridana, Holopaw, and Malabar soils do not have a dark, sandy subsoil. EauGallie and Pomona soils are similar to the Wabasso soil. The included soils make up 15 to 20 percent of the map unit.

This Wabasso soil has a seasonal high high water table within 12 inches of the surface for 1 to 4 months during most years. The available water capacity is low. Permeability is slow or very slow in the lower part of the subsoil.

Most of the acreage of this soil is in pasture. Some remains in natural vegetation that is mostly longleaf pine, South Florida slash pine, slash pine, cabbage palm, live oak, water oak, saw palmetto, gallberry, and switchgrass.

Wetness is a severe limitation affecting most cultivated crops. If a water-control system is used, many kinds of flowers and vegetables can be grown. The system must remove excess water in wet periods and provide subirrigation in dry periods. Crop residue and soil-improving cover crops help to maintain organic matter content and control soil blowing. Fertilizer should be applied according to the needs of the crop.

This soil is poorly suited to citrus because of the wetness. If properly drained, this soil is moderately suited to oranges and grapefruit. Trees should be planted on beds.

This soil is well suited to pasture and hay crops, such as pangolagrass and bahiagrass; however, drainage is needed to remove excess surface water duing heavy rainfall. Grass responds to fertilizer. Grazing should be controlled to maintain plant vigor and a good ground cover.

Typically, the South Florida Flatwoods range site includes areas of this soil. The dominant vegetation is scattered pine trees with an understory of saw palmetto and grass. If good grazing management practices are used, this range site has the potential to produce significant amounts of creeping bluestem, lopsided indiangrass, chalky bluestem, and various panicums. If range deterioration occurs, saw palmetto and pineland threeawn are dominant.

The potential productivity for pine trees is moderately high. The equipment use limitation, seedling mortality, and plant competition are major concerns in management. Slash pine and South Florida slash pine are the best trees to plant.

This soil is severely limited as a site for septic tank absorption fields, buildings, and local roads and streets. Special measures are required to overcome the excessive wetness. Septic tank absorption fields should be elevated by adding fill material. Foundations and roadbeds require special measures to provide additional strength.

The excessive wetness is a severe limitation affecting recreational uses. Water-control methods that keep the seasonal high water table below a depth of about 2.5 feet are required to overcome this limitation. Suitable topsoil or pavement can stabilize the surface in heavy traffic areas.

The capability subclass is IIIw.

63—Tavares-Urban land complex, 0 to 5 percent slopes. This map unit consists of moderately well drained Tavares soil and Urban land. The individual areas of Tavares soil and Urban land are so small and intermixed that mapping them separately at the selected scale is not practical. The areas are somewhat rectangular.

The Tavares soil makes up about 45 to 65 percent of the map unit. Typically, it has a dark grayish brown fine sand surface layer about 8 inches thick. The underlying material to a depth of at least 80 inches is brownish fine sand.

Under natural conditions this Tavares soil has a seasonal high water table at a depth of 40 to 80 inches for several months during most years. The available water capacity is very low. Permeability is rapid or very rapid.

The Urban land makes up about 20 to 45 percent of the map unit. It is covered by streets, driveways, houses and other buildings, parking lots, and other similar structures.

Included in mapping are areas of other sandy soils. These soils make up 15 to 20 percent of the map unit.

Present development precludes the use of this Tavares soil for crops, pasture, or pine tree production.

Neither a capability subclass nor a woodland ordination symbol has been assigned to this map unit.

64—Neilhurst-Urban land complex, 1 to 5 percent slopes. This map unit consists of areas of excessively drained Neilhurst soil and Urban land. The individual areas of Neilhurst soil and Urban land are so small and intermixed that mapping them separately at the selected scale is not practical. The areas range from about 10 to 20 acres and are irregular to somewhat rectangular in shape.

The Neilhurst soil makes up about 45 to 60 percent of the map unit. Typically, it has a grayish brown sand surface layer about 3 inches thick. The underlying material is light gray sand mixed with reddish brown and brown sand to a depth of at least 80 inches.

This Neilhurst soil generally does not have a high water table within a depth of 80 inches. In places the high water table is within 30 inches of the surface for brief periods during the summer rainy season. The available water capacity is very low. Permeability is very rapid.

The Urban land makes up about 20 to 45 percent of the map unit. It is covered by streets, driveways, houses and other buildings, parking lots, and other structures.

Included in mapping are areas where slickens have been added to the Neilhurst soil to improve the water-holding capacity. Differential settling of particles has resulted in intermittent ponds. These inclusions make up 15 to 20 percent of the map unit.

Present development precludes the use of this Neilhurst soil for crops, pasture, or pine tree production.

Neither a capability subclass nor a woodland ordination symbol has been assigned to this map unit.

66—Fort Meade-Urban land complex, 0 to 5 percent slopes. This map unit consists of areas of well drained Fort Meade soil and Urban land. The individual areas of Fort Meade soil and Urban land are so intermixed that mapping them separately at the selected scale is not practical. The areas are somewhat rectangular.

The Fort Meade soil makes up about 45 to 65 percent of the map unit. Typically, it has a very dark gray sand surface layer about 25 inches thick. The underlying material is brownish sand to a depth of at least 80 inches.

This Fort Meade soil does not have a water table within a depth of 72 inches. The available water capacity is low. Permeability is rapid.

The Urban land makes up about 20 to 45 percent of the complex. It is covered by streets, driveways, houses and other buildings, parking lots, and other similar structures.

Included in mapping are small areas of other sandy soils. These soils make up 15 to 20 percent of the map unit.

Present development precludes the use of this Fort Meade soil for crops, pasture, or pine tree production.

Neither a capability subclass nor a woodland ordination symbol has been assigned to this map unit.

67—Bradenton fine sand. This poorly drained soil is on flatwoods and in low hammocks. Areas of this soil range from 10 to several hundred acres. Slopes are smooth to convex and are 0 to 2 percent.

Typically, this soil has a black fine sand surface layer about 4 inches thick. The subsurface layer is dark grayish brown fine sand to a depth of about 12 inches. The subsoil is dark gray sandy loam to a depth of about 16 inches and gray sandy clay loam to a depth of about 22 inches. The underlying material is white sandy loam to a depth of about 60 inches and light gray loamy sand to a depth of at least 80 inches.

Included with this soil in mapping are small areas of Chobee, Felda, and Wabasso soils. Felda soils have a loamy subsoil at a depth of 20 to 40 inches. Wabasso soils have a dark subsoil. Chobee soils are similar to the Bradenton soil. The included soils make up about 10 to 30 percent of the map unit.

This Bradenton soil has a seasonal high water table within 12 inches of the surface for 1 to 4 months in most years. The available water capacity is moderate. Permeability is moderate in the subsoil.

The natural vegetation is mostly a hammock of cabbage palm, live oak, laurel oak, and water oak with scattered slash pine, South Florida slash pine, and longleaf pine. The understory is mostly saw palmetto, waxmyrtle, a variety of vines, creeping bluestem, pineland threeawn, and low panicums.

Wetness is a severe limitation affecting cultivated crops. If a complete water-control system is installed and maintained, many fruits and vegetables can be grown. The system must remove excess surface and internal water rapidly and provide a means of applying irrigation water. Good management also includes crop rotations that keep a close-growing crop on the land at least two-thirds of the time. Soil-improving cover crops and crop residue help to control soil blowing and to maintain organic matter content. Seedbed preparation should include bedding, and fertilizer should be applied according to the needs of the crop.

If water is controlled adequately, this soil is well suited to citrus. A water-control system should maintain good drainage to an effective depth. Bedding of the land and planting the trees on the beds provide good surface drainage. A close-growing plant cover should be maintained between the trees to control soil blowing. Fertilizer is needed.

This soil is well suited to pastures of pangolagrass, bahiagrass, and clover. Good pastures of grass or grass-clover mixtures can be grown. Fertilizer and controlled grazing are needed for the highest yields.

Typically, the Oak Hammock range site includes areas of this soil. The dominant vegetation is a dense canopy of predominantly live oak trees. Because of the dense canopy and relatively open understory, cattle use this range site mainly for shade and resting areas. Desirable forage includes longleaf uniola, low panicums, low paspalum, switchgrass, and lopsided indiangrass.

The potential productivity for pine trees is high. The major concerns in management are the equipment use limitation, seedling mortality, and plant competition. Planting the trees on beds lowers the effective depth of the water table. A water-control system can remove excess surface water. Slash pine and South Florida slash pine are the best trees to plant.

This soil is severely limited as a site for most urban uses because of the wetness. Because of the high water table, sites for small buildings without basements should be mounded to prevent moisture problems. Septic tank absorption fields should also be mounded to maintain them above the seasonal high water table and to increase percolation. Most of the problems caused by the wetness can be overcome by providing adequate drainage.

The wetness and the sandy surface are severe limitations affecting recreational uses. The problems caused by the wetness can be overcome if a water-control system can be established to keep the high water table below a depth of 2.5 feet. Suitable topsoil or pavement can stabilize the surface in heavy traffic areas.

The capability subclass is IIIw.

68—Arents, 0 to 5 percent slopes. These highly variable soils have been reworked by earth-moving equipment during phosphate mining. The areas of these soils are reclaimed and planted to grass and pine trees. Slopes are smooth to convex. The areas range from 5 to 500 acres. The soil material is 2 to 20 feet thick. Small open pits filled with water are common in some areas.

Typically, these soils consist of mixed soil material that is white, light gray, brownish yellow, very pale brown, yellowish brown, grayish brown, brown, dark brown, and black. They are fine sand, sand, loamy sand, sandy loam, sandy clay loam, sandy clay, or clay and are remnants of spodic and argillic horizons. They do not have an orderly sequence of horizons.

The available water capacity, although quite variable, generally is low but increases with clay content. Permeability is variable but generally ranges from moderately rapid to slow. Drainage is variable depending upon the amount of clay. In most areas the high water table is within 60 inches of the surface for 2 to 6 months during most years.

These soils are very severely limited for cultivated crops because of variations in soil texture. Water percolation is variable, which causes problems with irrigation, drainage, and erosion. Aeration is poor because of compaction, and the soil has a tendency to develop a surface crust.

These soils are moderately suited to improved pasture and pine trees. Low fertility, the hazard of erosion, and soil compaction are limiting factors. Bahiagrass is the most common pasture grass. Grazing should be controlled to maintain plant vigor. Most plantings are experimental.

These soils are moderately well suited to use as habitat for upland wildlife.

Most areas are moderately well suited to dwellings without basements; however, onsite investigation is needed before constructing buildings or installing septic systems. In some places these soils need to be compacted to provide sufficient strength. Lawn grasses and ornamental plants require fertilizer, and water-control measures are needed to remove excess water during the rainy season. Topsoil is needed in most areas to make a suitable root zone.

Most areas have moderate restrictions for recreational uses because of the wetness and the hazard of erosion.

Neither a capability subclass nor a woodland ordination symbol has been assigned to this map unit.

70—Duette fine sand. This moderately well drained soil is on low ridges on flatwoods. Areas of this soil range from about 10 to 300 acres. Slopes are smooth to concave and are 0 to 2 percent.

Typically, this soil has a gray fine sand surface layer about 7 inches thick. The subsurface layer is fine sand to a depth of about 59 inches. It is light brownish gray to a depth of about 10 inches and white below that depth. The subsoil to a depth of at least 80 inches is dark brown fine sand that grades to black.

Included with this soil in mapping are small areas of Archbold, Electra, and Pomello soils. Archbold soils do not have a dark subsoil. Electra and Pomello soils are similar to the Duette soil. The included soils make up about 10 to 20 percent of the map unit.

This Duette soil has a seasonal high water table at a depth of 4 to 6 feet for 1 to 4 months during most years. The available water capacity is low. Permeability is moderately rapid in the subsoil.

Most areas of this soil are used for improved pasture. Some remain in natural vegetation that is mostly myrtle oak, Chapman oak, sand live oak, turkey oak, sand pine, and slash pine. The understory includes saw palmetto, running oak, and pineland threeawn.

Droughtiness and the rapid leaching of plant nutrients are severe limitations affecting cultivated crops. Natural fertility is low, and the response to fertilizer is slight.

This soil is poorly suited to citrus; however, fair yields of oranges and grapefruit generally can be obtained if a good irrigation system is used. Where water for irrigation is readily available, increased yields are feasible.

This soil is fairly suited to pastures of pangolagrass and bahiagrass. Grazing should be controlled to maintain plant vigor and good ground cover.

Typically, the Sand Pine Scrub range site includes areas of this soil. This dominant vegetation is a fairly dense stand of sand pine trees with a dense understory of oak, saw palmetto, and other shrubs. Because of past timber management practices, sand pines are not on all sites. The droughtiness limits the potential for producing native forage. If good grazing management practices are used, this range site has the potential to provide limited amounts of lopsided indiangrass, creeping bluestem, and switchgrass. Livestock generally do not use this range site if more productive sites are available. Summer shade, winter protection, and dry bedding ground during wet periods are provided on this range site.

The potential productivity for pine trees is low. The main concerns in management are the moderate equipment use limitation and severe seedling mortality. Slash pine and South Florida slash pine are the best trees to plant.

This soil is only slightly limited as a site for most urban uses; however, seepage is a severe limitation affecting sewage lagoons and sanitary landfills. The sidewalls of lagoons and landfills should be sealed.

The sandy surface causes poor trafficability in recreational areas. Suitable topsoil or some form of surfacing can reduce or overcome this limitation.

The capability subclass is VIs.

72—Bradenton-Felda-Chobee association, frequently flooded. This map unit consists of poorly drained Bradenton and Felda soils, a very poorly drained Chobee soil, and some similar soils. It is about 40 percent Bradenton soil, 30 percent Felda soil, 20 percent Chobee soil, and 10 percent other soils. These soils are in a regular repeating pattern along the flood plain of the Peace River and adjacent streams, mainly in the southern part of the county. The Felda and Bradenton soils generally are in the highest positions on the landscape, and the Chobee soil is in the lowest positions. Slopes are less than 2 percent. The areas of each soil are large enough to be mapped separately, but because of the present and predicted use, these soils were mapped as one unit. The areas generally are narrow.

The composition of this map unit is more variable than that of most other map units in the county; nevertheless, valid interpretations for expected uses of these soils can still be made.

Typically, this Bradenton soil has a very dark gray fine sand surface layer about 6 inches thick. The subsurface layer is grayish brown fine sand to a depth of about 12 inches. The subsoil is dark grayish brown sandy loam to a depth of about 21 inches. The underlying material is gray or light gray sandy loam to a depth of about 58 inches and gray fine sand or loamy sand to a depth of 80 inches. In some places the surface layer is thicker.

Unless drained, this Bradenton soil has a seasonal high water table within a depth of 12 inches for 1 to 4 months during most years. Permeability is moderate in the subsoil. The available water capacity is moderate.

Typically, this Felda soil has a very dark gray fine sand surface layer about 3 inches thick. The subsurface layer is light brownish gray fine sand to a depth of about 22 inches. The subsoil is gray sandy loam to a depth of about 35 inches and light gray loamy sand to a depth of about 45 inches. The underlying material is greenish gray loamy sand that extends to a depth of 80 inches. In some places the surface layer is thicker.

Unless drained, this Felda soil has a seasonal high water table within a depth of 12 inches for 2 to 6 months in most years. Permeability is moderately rapid in the subsoil.

Typically, this Chobee soil has a black fine sandy loam surface layer about 12 inches thick. The subsoil extends to a depth of 55 inches. In sequence downward it is gray sandy clay loam; grayish brown sandy clay loam that has pockets of soft, white carbonatic material; and gray sandy loam. The underlying material to a depth of 80 inches or more is light brownish gray fine sand. In some places the subsoil has more clay.

Unless drained, this Chobee soil has a seasonal high water table at a depth of less than 12 inches for 6 months or more in most years. Permeability is slow or very slow in the subsoil. The available water capacity is moderate.

Included with this association in mapping are areas of Floridana, Holopaw, and Pompano soils. Floridana and Holopaw soils are similar to Bradenton, Felda, and Chobee soils. Pompano soils do not have a loamy subsoil. Also included are small areas of organic soils.

Almost all areas of the soils in this map unit are in natural vegetation that is mostly sweetgum, oak, bay, cypress, blackgum, red maple, cabbage palm, scattered pines, and saw palmetto. Water-tolerant grasses are in a few places.

Bradenton, Felda, and Chobee soils are not suited to crops, but they are moderately well suited to improved pasture. Wetness and the hazard of flooding are difficult to overcome. If the soils are drained and well managed, good quality pasture plants can be grown.

These soils are not suited to citrus.

The potential productivity for slash pine is high on Bradenton soil and moderately high on Felda soil. The Chobee soil is not suited to pine because of the very long duration of flooding. The equipment limitation and seedling mortality caused by the wetness are the main concerns in management. Slash pine and South Florida slash pine are the best trees to plant. Water control is needed in most areas to reach the yield potential.

The wetness and the hazard of flooding are severe limitations affecting urban and recreational development, and careful consideration and planning are needed.

The Bradenton, Felda, and Chobee soils are in capability subclass Vw.

73—Gypsum land. This miscellaneous area consists of gypsum, a by-product of acid manufacturing plants in the phosphate mining area. Gypsum is formed by reacting sulfuric acid with rock phosphate to form phosphoric acid. It is mostly a white crystalline substance with various impurities of silica and organic matter. The material is mounded 30 to 80 feet high. The areas are 100 to 640 acres.

Gypsum land generally is barren, but weeds and wild grasses grow in some places. Acidity and compaction inhibit the growth of most plants.

Gypsum land has very limited use. It has been used as a soil conditioner and experimentally as a road base; however, the suspected low level radiation has discouraged the use of gypsum in most cases.

Neither a capability subclass nor a woodland ordination symbol has been assigned to this map unit.

74—Narcoossee sand. This somewhat poorly drained soil is on low hammocks and ridges on flatwoods. Areas of this soil range from 3 to 100 acres. Slopes are smooth to convex and are 0 to 2 percent.

Typically, this soil has a very dark gray sand surface layer about 5 inches thick. The subsurface layer is light gray fine sand to a depth of about 17 inches. The subsoil is black sand to a depth of about 19 inches, dark reddish brown sand to a depth of about 22 inches, and dark yellowish brown fine sand to a depth of about 30 inches. The underlying material is pale brown fine sand to a depth of about 48 inches and pinkish gray loamy sand to a depth of 80 inches.

Included with this soil in mapping are small areas of Adamsville, Myakka, Pomello, and Tavares soils. Adamsville and Tavares soils do not have a dark subsoil. Myakka soils are poorly drained. Pomello soils are similar to the Narcoossee soil. The included soils make up about 5 to 10 percent of the map unit.

This Narcoossee soil has a seasonal high water table at a depth of 24 to 40 inches for 4 to 6 months during most years. The available water capacity is low. Permeability is moderately rapid in the subsoil.

The natural vegetation is mostly water oak, live oak, laurel oak, cabbage palm, scattered pines, greenbrier, saw palmetto, pineland threeawn, creeping bluestem, and panicums.

Periodic wetness, droughtiness, and low fertility are severe limitations affecting cultivated crops. Intensive soil management practices are required. If good water-control and soil-improving measures are used, vegetable crops can be grown. A water-control system must remove excess water in wet periods and provide water for irrigation in dry periods. Row crops should be rotated with close-growing, soil-improving crops that remain on the land two-thirds of the time. Crop residue and soil-improving crops should be plowed under. Fertilizer and lime should be added according to the needs of the crop.

In its natural state, this soil is poorly suited to citrus because of the wetness. It is moderately suited if a water-control system is used that maintains the water table at an effective depth. Citrus trees should be planted on beds, and a plant cover should be maintained between the trees to control soil blowing in dry weather and water erosion during heavy rainfall. Fertilizer and lime are needed. The highest yields require irrigation in periods of light rainfall.

This soil is moderately well suited to pastures of pangolagrass and bahiagrass. Drainage is required to remove excess surface water in times of heavy rainfall. Regular applications of fertilizer and lime are needed. Grazing should be controlled to maintain healthy plants for highest yields.

Typically, the Oak Hammock range site includes areas of this soil. The dominant vegetation is a dense canopy of predominantly live oak trees. Because of the dense canopy and relatively open understory, cattle use this range site mainly for shade and resting areas. Desirable forage includes longleaf uniola, low panicums, low paspalum, switchgrass, and lopsided indiangrass.

The potential productivity for pine trees is moderately high. The major concerns in management are the equipment use limitation, moderate seedling mortality, and plant competition. Slash pine, South Florida slash pine, and longleaf pine are the best trees to plant.

The wetness is a severe limitation affecting septic tank absorption fields and a moderate limitation affecting dwellings without basements and local roads and streets. It can be overcome by elevating the absorption field and, if adequate outlets are available, by using a water-control system that keeps the high water table below a depth of 2.5 feet. Adding fill material to elevate building sites and roadways is needed if effective water control cannot be established.

The sandy surface is a severe limitation affecting recreational uses. Suitable topsoil or pavement can be used to stabilize the surface.

The capability subclass is IIIw.

75—Valkaria sand. This poorly drained soil is in sloughs on flatwoods. Areas of this soil range from about 20 to several hundred acres. Slopes are smooth to concave and are 0 to 2 percent.

Typically, this soil has a black sand surface layer about 5 inches thick. The subsurface layer is light gray sand to a depth of about 26 inches. The subsoil is brownish sand to a depth of about 46 inches. The underlying material is light gray and white sand to a depth of at least 80 inches.

Included with this soil in mapping are small areas of Basinger, Felda, Malabar, Myakka, and Smyrna soils. Felda and Malabar soils have a loamy subsoil. Myakka and Smyrna soils have a dark subsoil. Basinger soils are similar to the Valkaria soil. The included soils make up about 20 to 40 percent of the map unit.

This Valkaria soil has a seasonal high water table within a depth of 12 inches for 2 to 4 months during most years. During periods of heavy rainfall, the surface is covered by shallow, slowly moving water for 1 to 7 days or more. The available water capacity is low, and permeability is rapid.

The natural vegetation is mostly waxmyrtle, gallberry, cabbage palm, pineland threeawn, scattered saw palmetto, pine, and oak.

Wetness is a very severe limitation affecting cultivated crops. Intensive soil management practices are required. If good water-control and soil-improving measures are used, vegetable crops can be grown. A water-control system must remove excess water in wet periods and provide water through subirrigation in dry periods. Row crops should be rotated with close-growing, soil-improving crops, which remain on the land three-fourths of the time. Crop residue and soil-improving crops help to maintain organic matter content and protect the soil from erosion. Seedbed preparation should include bedding of the rows. Fertilizer and lime should be added according to the needs of the crop.

This soil is poorly suited to citrus because of the wetness. It is suited only if a water-control system is used that maintains the water table at an effective depth. Citrus trees should be planted on beds, and a plant cover should be maintained between the trees to control soil blowing in dry weather and water erosion during heavy rainfall. Fertilizer and lime are needed.

This soil is well suited to pastures of pangolagrass, improved bahiagrass, and white clover. Water-control measures are needed to remove excess surface water

Figure 8.—An area of Valkaria sand. Cypress and hardwood swamps are common in the Slough range site.

after heavy rainfall. Fertilizer and lime are needed. Grazing should be controlled to prevent overgrazing and weakening of the plants or to maintain healthy plants for the highest yields.

Typically, the Slough range site includes areas of this soil (fig. 8). The dominant vegetation is an open expanse of grasses, sedges, and rushes in an area where the soil is saturated during the rainy season. If good grazing management practices are used, this range site has potential for forage production almost as high as that of the Freshwater Marshes and Ponds range site. Desirable forage includes blue maidencane, maidencane, chalky bluestem, toothachegrass, and Florida bluestem. If excessive grazing occurs, common carpetgrass, an introduced plant, is dominant.

The potental productivity for pine trees is moderate. The major concerns in management, caused by the wetness, are the severe equipment use limitation and moderate seedling mortality. If surface drainage and bedding are used, slash pine and South Florida slash pine are the best trees to plant.

This soil is severely limited as a site for septic tank absorption fields, sanitary landfills, and building site development because of the wetness and seepage. The wetness and the sandy texture are severe limitations affecting recreational uses. A combination of drainage and fill can improve conditions for most urban and recreational uses.

The capability subclass is IVw.

76—Millhopper fine sand, 0 to 5 percent slopes. This moderately well drained soil is on upland ridges and knolls on flatwoods. Areas of this soil range from about 10 to 40 acres. Slopes are smooth to concave.

Typically, this soil has a dark grayish brown fine sand surface layer about 6 inches thick. The subsurface layer to a depth of about 63 inches is light yellowish brown and very pale brown fine sand. The subsoil is fine sandy loam to a depth of at least 80 inches. It is light yellowish brown in the upper part and gray in the lower part.

Included with this soil in mapping are small areas of Apopka, Kendrick, Sparr, and Tavares soils. Apopka and Kendrick soils are in the highest, better drained positions on the landscape, and Sparr soils are in the lower, wetter positions. Tavares soils are in the same positions on the landscape as those of the Millhopper soil, but they do not have a loamy subsoil. Apopka, Kendrick, and Sparr soils are similar to the Millhopper soil. The included soils make up less than 10 percent of the map unit.

This Millhopper soil has a seasonal high water table at a depth of 40 to 60 inches for 1 to 4 months in most years. The available water capacity is low. Permeability is slow in the subsoil.

Most areas of this soil are in citrus. Some remain in natural vegetation that is mostly live oak, laurel oak, slash pine, South Florida slash pine, and longleaf pine.

Droughtiness and rapid leaching of plant nutrients are severe limitations affecting cultivated crops. Intensive soil management practices are needed if this soil is cultivated. Row crops should be planted on the contour in strips of close-growing crops. Crop rotations should keep the close-growing crops on the land at least three-fourths of the time. Soil-improving crops and crop residue help to protect the soil from erosion. Unless irrigation is used, only a few crops produce good yields. Irrigation generally is feasible only where irrigation water is readily available.

In places relatively free from freezing temperatures, this soil is suited to citrus. A good ground cover of close-growing plants is needed between the trees to control soil blowing and water erosion. Good yields of oranges and grapefruit can be obtained in some years without irrigation; however, a well designed irrigation system that maintains optimum moisture conditions is needed to obtain the highest yields.

This soil is moderately suited to pasture and hay crops. Deep-rooted plants, such as coastal bermudagrass and bahiagrass, are suitable, but yields are reduced by periodic droughts. Fertilizer and lime are needed.

Typically, the Oak Hammock range site includes areas of this soil. The dominant vegetation is a dense canopy of predominantly live oak trees. Because of the dense canopy and relatively open understory, cattle use this range site mainly for shade and resting areas. Desirable forage includes longleaf uniola, low panicums, low paspalum, switchgrass, and lopsided indiangrass.

The potential productivity for pine trees is moderately high. The major concerns in management are the equipment use limitation, seedling mortality, and plant competition. Slash pine, South Florida slash pine, and longleaf pine are the best trees to plant.

This soil is moderately limited as a site for septic tank absorption fields because of the wetness. The absorption field should be slightly elevated. The soil is well suited to use as a site for dwellings without basements and local roads and streets.

The sandy surface is a severe limitation affecting recreational uses. Suitable topsoil or pavement can be used to stabilize the surface.

The capability subclass is IIIs.

77—Satellite sand. This somewhat poorly drained soil is on low knolls and ridges on flatwoods. Areas of this soil range from 3 to 200 acres. Slopes are smooth to convex and are 0 to 2 percent.

Typically, this soil has a very dark gray sand surface layer about 6 inches thick. The underlying material to a depth of at least 80 inches is gray sand that grades to grayish brown.

Included with this soil in mapping are small areas of Archbold, Immokalee, Pomello, and Pompano soils. Immokalee and Pomello soils have a dark subsoil. Pompano soils are poorly drained. Archbold soils are similar to the Satellite soil. The included soils make up about 5 to 10 percent of the map unit.

This Satellite soil has a seasonal high water table within a depth of 12 to 40 inches for 2 to 6 months in most years. The available water capacity is very low. Permeability is very rapid.

The natural vegetation is mostly slash pine, saw palmetto, sand live oak, and pineland threeawn.

This soil is not suited to cultivated crops or citrus because of periodic wetness, droughtiness, and low fertility.

This soil is only fairly suited to pastures of pangolagrass and bahiagrass.

Typically, the Sand Pine Scrub range site includes areas of this soil. The dominant vegetation is a fairly dense stand of sand pine trees with a dense understory of oak, saw palmetto, and other shrubs. Because of past timber management practices, sand pines are not on all sites. Droughtiness limits the potential for producing native forage. If good grazing management practices are used, this range site has the potential to provide limited amounts of lopsided indiangrass, creeping bluestem, and switchgrass. Livestock generally do not use this range site if more productive sites are available. Summer shade, winter protection, and dry bedding ground during wet periods are provided on this range site.

The potential productivity for pine trees is moderate. The major concerns in management are the equipment use limitation, seedling mortality, and plant competition. Slash pine, South Florida slash pine, and longleaf pine are the best trees to plant.

This soil is severely limited as a site for septic tank absorption fields, sanitary landfills, and sewage lagoons because of the wetness and seepage. The wetness is a severe limitation affecting sites for dwellings without basements and small commercial buildings. Fill material can be added to increase the effective depth to the high water table.

The sandy surface and the wetness are severe limitations affecting recreational uses. Suitable topsoil or pavement can be used to stabilize the surface.

The capability subclass is VIs.

78—Paisley fine sand, stony subsurface. This poorly drained soil is on low, broad flatwoods. Areas of this soil range from 40 to several hundred acres. Surface and subsurface boulders and stones occur randomly in small groups, individually 20 to 100 feet apart, or in large groups scattered throughout the map unit. Cropland and improved pastureland generally have fewer boulders and stones because many have been removed, but the remaining boulders and stones can damage equipment that penetrates the soil. Slopes are smooth and are 0 to 2 percent.

Typically, this soil has a very dark gray fine sand surface layer about 4 inches thick. The subsurface layer is gray and light gray stony fine sand to a depth of about 18 inches. The subsoil is light brownish gray sandy clay to a depth of about 22 inches and gray sandy clay to a depth of about 34 inches. To a depth of about 60 inches it is gray sandy clay that has many soft limestone nodules. The underlying material is unconsolidated limestone.

Included with this soil in mapping are small areas of Bradenton, Felda, and Wabasso soils. Felda and Wabasso soils have a loamy subsoil at a depth of 20 to 40 inches. Bradenton soils are similar to the Paisley soil. The included soils make up about 15 to 30 percent of the map unit.

This Paisley soil has a seasonal high water table within 12 inches of the surface for 2 to 4 months during most years. The available water capacity is moderate. Permeability is slow in the subsoil.

The natural vegetation is mostly slash pine, South Florida slash pine, oak, sweetgum, and cabbage palm. The understory includes saw palmetto, pineland threeawn, gallberry, staggerbush, and low panicums.

Wetness is a severe limitation affecting cultivated crops. Unless boulders and stones at or near the surface are removed, they can cause problems during operations that mix the surface layer. The slow permeability makes adequate drainage difficult to establish and maintain. If adequately drained, this soil is suited to several important crops. A water-control system is needed to remove excess surface and subsurface water rapidly. Crop rotations should keep close-growing, soil-improving crops on the land at least two-thirds of the time. Fertilizer, applied according to the needs of the crop, and occasional applications of lime are needed for the highest yields.

In its natural condition, this soil is poorly suited to citrus. It is suited only if a water-control system is used that maintains the high water table at an effective depth. Surface boulders and stones must be removed before bedding. The trees should be planted on beds, and a plant cover should be maintained between the trees.

This soil is well suited to pastures of pangolagrass, improved bahiagrass, and white clover. Water-control measures are needed to remove excess surface water after heavy rainfall. Boulders and stones must be removed to prevent damage to equipment.

Typically, the South Florida Flatwoods range site includes areas of this soil. The dominant vegetation is scattered pine trees with an understory of saw palmetto and grass. If good grazing management practices are used, this range site has the potential to produce significant amounts of creeping bluestem, lopsided indiangrass, chalky bluestem, and various panicums. If range deterioration occurs, saw palmetto and pineland threeawn are dominant.

The potential productivity for pine trees is very high. The major concerns in management, caused by the wetness and boulders, are the severe equipment use limitation, seedling mortality, and plant competition. Slash pine and South Florida slash pine are the best trees to plant.

This soil is severely limited as a site for urban and recreational uses because of the wetness, the high shrink-swell potential, and the clayey subsoil. A drainage system that lowers the seasonal high water table can reduce or overcome the wetness limitation. Because of the wetness and the slow permeability, mounding is needed in places for septic tank absorption fields. Random large boulders and stones can make it necessary to modify installation of structures or to select an alternate site within the map unit.

The sandy surface causes poor trafficability in recreational areas. Good topsoil material or some type of surface stabilization can easily overcome this problem.

The capability subclass is IIIw.

80—Chobee fine sandy loam, frequently flooded. This very poorly drained soil is on flood plains. Areas of this soil range from 50 to several hundred acres. Slopes are smooth to concave and are 0 to 2 percent.

Typically, this soil has a black fine sandy loam surface layer about 12 inches thick. The subsoil extends to a depth of 55 inches. It is gray sandy clay loam to a depth of about 18 inches. To a depth of about 32 inches, it is grayish brown sandy clay loam that has pockets of soft, white carbonatic material. Below that depth the subsoil is gray sandy loam. The underlying material to a depth of at least 80 inches is light brownish gray fine sand.

Included with this soil in mapping are Floridana, Kaliga, Nittaw, and Paisley soils. Floridana soils have a loamy subsoil at a depth of 20 to 40 inches. Kaliga soils are organic. Nittaw and Paisley soils are similar to the Chobee soil. The included soils make up 5 to 15 percent of the map unit.

This Chobee soil has a seasonal high water table within 12 inches of the surface for more than 6 months in most years. It is subject to flooding during periods of heavy rainfall. The available water capacity is moderate. Permeability is slow or very slow in the subsoil.

Most of the acreage of this soil remains in natural vegetation that is mainly mixed hardwoods, baldcypress, red maple, and gum with an understory of waxmyrtle, cabbage palm, and a few shade- and water-tolerant forbs and grasses.

This soil is too wet for cultivated crops, citrus, or pasture. The flooding and the wetness are difficult to overcome.

The potential productivity for pine trees is low because of the surface wetness. Pine trees can be highly productive if water-control systems are developed. The major concerns in management, caused by wetness, are severe seedling mortality and the equipment use limitation. Pine trees are generally not planted on this soil.

This soil is not suited to urban and recreational uses because of the wetness and the flooding.

81—St. Augustine sand. This somewhat poorly drained soil is on ridges or mounds along the Kissimmee River. It was formed by dredging the river. Slopes generally are 0 to 2 percent; they are steeper on the edge of the ridges or mounds.

Typically, this soil has a gray sand surface layer about 2 inches thick. The underlying material to a depth of at least 80 inches is light gray sand that has shell and fragments of shell. A few pockets of sandy loam and sandy clay loam are at a depth of 25 to 60 inches.

Included with this soil in mapping are small areas of Kaliga and Samsula soils in which the sand extends to a depth of less than 20 inches and shell fragments cover the surface. Also included are areas of other St. Augustine soils in which the sand is underlain by clay to a depth of 40 to 80 inches. The included soils make up less than 15 percent of the map unit.

This St. Augustine soil has a seasonal high water table at a depth of 20 to 30 inches for 2 to 6 months in most years and at a depth of at least 50 inches during long, dry periods. The available water capacity is low. Permeability is rapid.

Some areas of this soil are used for improved pasture. Most are nearly barren and have only a few desirable grasses.

This soil is not suited to cultivated crops. Droughtiness and rapid leaching of plant nutrients limit the choice of plants and reduce potential crop yields.

This soil is poorly suited to pasture and hay crops. Grasses are difficult to establish because of the low fertility and the droughtiness.

The potential productivity for pine trees is low. Seedling mortality is a concern in management. Slash pine is the best tree to plant. This soil has not been used for commercial woodland.

This soil is severely limited for most urban uses because it is too wet during periods of heavy rainfall and too sandy during periods of drought. The high water table interferes with the proper functioning of septic tank absorption fields. The high water table and seepage interfere with the proper functioning of sewage lagoons and sanitary landfills. Wetness is a moderate limitation affecting sites for buildings and local roads and streets. It can be overcome by adding suitable fill material.

The sandy surface is a severe limitation affecting recreational uses. Suitable fill material can improve trafficability.

The capability subclass is VIIs. A woodland ordination symbol is not assigned to this soil.

82—Felda fine sand, frequently flooded. This poorly drained soil is on the flood plains of well defined creeks and streams. Areas of this soil range from 25 to several hundred acres. Slopes are smooth to concave and are 0 to 1 percent.

Typically, the surface layer is very dark gray fine sand about 3 inches thick. The subsurface layer is light brownish gray fine sand to a depth of about 22 inches. The subsoil is gray sandy loam to a depth of about 35 inches and light gray loamy sand to a depth of about 45 inches. The underlying material is greenish gray loamy sand to a depth of at least 80 inches.

Included with this soil in mapping are small areas of Floridana and Holopaw soils, which are similar to the Felda soil. These soils make up 15 to 20 percent of the map unit.

This Felda soil has a seasonal high water table within 12 inches of the surface for 2 to 4 months during most years. On the average it is flooded more than once during most years. The flooding results in deposition on or scouring of the surface. In addition, debris is deposited on the surface and sand is deposited adjacent to the channel. The available water capacity is moderate, and permeability is moderately rapid in the subsoil.

The natural vegetation is mostly red maple, water oak, cabbage palm, scattered pines, and many water-tolerant grasses.

The frequent flooding prevents using this soil for cultivated crops, citrus, or urban development.

If an adequate water-control system can be established, the potential productivity for pine trees is moderately high. Because of the frequent flooding and the wetness, the equipment use limitation, seedling mortality, and plant competition are management concerns. Slash pine and South Florida slash pine are the best trees to plant; however, pine trees are normally not planted on this soil.

The capability subclass is Vw.

83—Archbold sand, 0 to 5 percent slopes. This moderately well drained soil is on uplands and knolls on flatwoods. Areas of this soil range from about 15 to several hundred acres. Slopes are smooth to concave.

Typically, this soil has a gray sand surface layer about 4 inches thick. The underlying material is white sand to a depth of at least 80 inches.

Included with this soil in mapping are small areas of Duette and Satellite soils. Duette soils have a dark subsoil. The included soils make up about 5 to 15 percent of the map unit.

This Archbold soil has a seasonal high water table at a depth of 42 to 60 inches for 1 to 6 months in most years and at a depth of 60 to 80 inches for most of the rest of the year. The available water capacity is very low, and permeability is very rapid.

Most areas of this soil are in native vegetation. Some have been cleared and are used for citrus. Other areas are used for urban development. The natural vegetation is mostly sand pine, Chapman oak, myrtle oak, sand live oak, scrub hickory, saw palmetto, pricklypear, and scattered pineland threeawn.

This soil is not suited to cultivated crops.

This soil is suited to citrus. A ground cover of close-growing plants is needed between the trees to control soil blowing. A well designed irrigation system that maintains optimum moisture conditions is needed to ensure the best yields. Regular applications of fertilizer and lime help to maintain plant vigor and produce the best yields.

This soil is fairly suited to pasture grasses, such as pangolagrass and bahiagrass, if good management practices are used (fig. 9).

Typically, the Sand Pine Scrub range site includes areas of this soil. The dominant vegetation is a fairly dense stand of sand pine trees with a dense understory of oak, saw palmetto, and other shrubs. Because of past timber management practices, sand pines are not on all sites. Droughtiness limits the potential for producing native forage. If good grazing management practices are used, this range site has the potential to provide limited amounts of lopsided indiangrass, creeping bluestem, and switchgrass. Livestock generally do not use this range site if more productive sites are available. Summer shade, winter protection, and dry bedding ground during wet periods are provided on this range site.

The potential productivity for pine trees is low. The major concerns in management, caused by the sandiness and the droughtiness, are the equipment use limitation and seedling mortality. Sand pine is the best tree to plant.

This soil is only slightly limited as a site for most urban uses; however, seepage is a severe limitation affecting sewage lagoons and landfill areas. The sidewalls and bottom of lagoons and landfills should be sealed.

The sandy surface causes poor trafficability in recreational areas. Suitable topsoil or some form of surfacing can reduce or overcome this limitation.

The capability subclass is VIs.

85—Winder fine sand, depressional. This very poorly drained soil is in depressions on flood plains.

Figure 9.—Fair yields of pasture and hay crops can be produced on Archbold sand, 0 to 5 percent slopes.

Areas of this soil range from 3 to several hundred acres. Slopes are concave and are 0 to 2 percent.

Typically, this soil has a dark gray fine sand surface layer about 4 inches thick. The subsurface layer is light brownish gray fine sand to a depth of about 16 inches. The subsoil is dark gray sandy clay loam to a depth of about 50 inches. Vertical tongues of loamy sand are in the upper 4 inches of the subsoil. The underlying material is olive gray sandy loam to a depth of least 80 inches.

Included with this soil in mapping are small areas of Chobee, Felda, Floridana, and Malabar soils. Felda, Floridana, and Malabar soils have a loamy subsoil at a depth of more than 20 inches. Chobee soils are similar to the Winder soil. The included soils make up about 10 to 25 percent of the map unit.

This Winder soil is ponded for 6 months or more in most years. Areas on flood plains are subject to frequent flooding as well as ponding. The available water capacity is moderate. Permeability is slow or moderately slow in the subsoil.

The natural vegetation is mostly St. Johnswort, pickerelweed, waxmyrtle, gallberry, maidencane, and other water-tolerant forbs and grasses. A few areas are in water-tolerant trees.

The ponding is a very severe limitation affecting cultivated crops. Crops cannot be grown unless this soil is drained, and suitable drainage outlets generally are not available.

This soil is not suited to citrus because of the high water table and a shallow root zone.

Because of the shallow root zone and the ponding, this soil is not suited to pasture unless drainage outlets are established.

Typically, the Freshwater Marshes and Ponds range site includes areas of this soil. The dominant vegetation is an open expanse of grasses, sedges, rushes, and other herbaceous plants in areas where the soil generally is saturated or covered with water for at least 2 months during the year. If good grazing management practices are used, this range site has the potential to produce more forage than any of the other range sites. Chalky bluestem and blue maidencane dominate the drier parts of the site, and maidencane is dominant in the wetter parts. Other desirable forage includes cutgrass, bluejoint panicum, sloughgrass, and low panicums. Periodic high water levels provide a much needed natural deferment from overgrazing. If excessive grazing occurs, common carpetgrass, an introduced plant, tends to dominate the drier parts of the site.

In its natural state, this soil is not suited to pine trees. The major concerns in management, caused by the wetness, are the equipment use limitation, seedling mortality, and plant competition.

This soil is not suited to urban and recreational uses because of the ponding. Reclamation is needed before development.

The capability subclass is VIIw.

86—Felda fine sand, depressional. This very poorly drained soil is in wet depressions on flatwoods. Areas of this soil range from 3 to more than 100 acres. Slopes are smooth to concave and are 0 to 2 percent.

Typically, this soil has a black fine sand surface layer about 6 inches thick. The subsurface layer is grayish brown and light brownish gray fine sand to a depth of about 27 inches. The subsoil is dark grayish brown sandy loam to a depth of about 38 inches and gray sandy clay loam to a depth of about 45 inches. The underlying material is gray loamy sand to a depth of at least 80 inches.

Included with this soil in mapping are small areas of Eaton, Floridana, and Holopaw soils. These soils are similar to the Felda soil. The included soils make up 15 to 20 percent of the map unit.

This Felda soil is ponded for more than 6 months during most years. The available water capacity is low. Permeability is moderately rapid in the subsoil.

Most of the acreage of this soil is in natural vegetation that is mostly cypress and other water-tolerant trees with an understory of waxmyrtle, vines, shrubs, and water-tolerant grasses.

Under natural conditions this soil is not suited to cultivated crops, citrus, or pasture. Crops cannot be grown unless this soil is drained, and drainage outlets are generally hard to establish.

Typically, the Freshwater Marshes and Ponds range site includes areas of this soil. The dominant vegetation is an open expanse of grasses, sedges, rushes, and other herbaceous plants in an area where the soil is generally saturated or covered with water for at least 2 months during the year. If good grazing management practices are used, this range site has the potential to produce more forage than any of the other range sites. Chalky bluestem and blue maidencane dominate the drier parts of the site, and maidencane is dominant in the wetter parts. Other desirable forage includes cutgrass, bluejoint panicum, sloughgrass, and low panicums. The periodic high water levels provide a much needed natural deferment from overgrazing. If excessive grazing occurs, common carpetgrass, an introduced plant, tends to dominate the drier parts of the site.

This soil is not suited to pine trees unless surface drainage or bedding is used. The major concerns in management, caused by the high water table, are the equipment use limitation, seedling mortality, and plant competition.

This soil is severely limited as a site for urban uses because of the ponding.

The capability subclass is VIIw.

87—Basinger fine sand. This poorly drained soil is in sloughs or poorly defined drainageways on flatwoods. Areas of this soil generally range from about 25 to several hundred acres. Slopes are smooth to concave and are 0 to 2 percent.

Typically, this soil has a dark gray fine sand surface layer about 7 inches thick. The subsurface layer is light gray fine sand to a depth of about 19 inches. The subsoil is a mixture of brown and light brownish gray fine sand to a depth of about 39 inches. The underlying material is light brownish gray fine sand to a depth of at least 80 inches.

Included with this soil in mapping are small areas of Immokalee, Myakka, Smyrna, Placid, and St. Johns soils. These soils are similar to the Basinger soil. They make up about 15 to 30 percent of the map unit.

This Basinger soil has a seasonal high water table within 12 inches of the surface for 2 to 4 months in most years. During periods of heavy rainfall, the surface is covered by shallow, slowly moving water for 1 to 7 or more days. The available water capacity is low. Permeability is rapid.

Most areas of this soil are rangeland or woodland. Some that have adequate water control are used for truck crops or improved pasture. The natural vegetation is mostly waxmyrtle, St. Johnswort, pineland threeawn, and scattered cypress and pines.

Wetness and droughtiness are very severe limitations affecting cultivated crops. If good water-control and soil-improving measures are used, vegetable crops can be grown.

In its natural condition, this soil is poorly suited to citrus. It is suited only if a water-control system is used that maintains the water table at an effective depth. Citrus trees should be planted on beds, and a plant cover should be maintained between the trees.

This soil is well suited to pastures of pangolagrass, improved bahiagrass, and white clover. Water-control measures are needed to remove excess surface water after heavy rainfall. Addition of lime and fertilizer increases quantity and quality of forage.

Typically, the Slough range site includes areas of this soil. The dominant vegetation is an open expanse of grasses, sedges, and rushes in an area where the soil is saturated during the rainy season. If good grazing management practices are used, this range site has potential forage production almost as high as that of the Freshwater Marshes and Ponds range site. Desirable forage includes blue maidencane, maidencane, chalky bluestem, toothachegrass, and Florida bluestem. If excessive grazing occurs, common carpetgrass, an introduced plant, is dominant.

The potential productivity for pine trees is moderate. The major concerns in management, caused by the wetness, are the equipment use limitation and seedling mortality. If surface drainage and bedding are adequate, slash pine and South Florida slash pine are the best trees to plant.

This soil is severely limited as a site for septic tank absorption fields and building site development because of the wetness and seepage. The wetness and the sandy surface, which causes poor trafficability, are severe limitations affecting recreational development. A combination of drainage and fill improves conditions for most urban and recreational uses.

The capability subclass is IVw.

Use and Management of the Soils

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

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

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

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

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

Health officials, highway officials, engineers, real estate agents, appraisers, 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. It can also help to determine the market value of residential and commercial sites.

Crops and Pasture

William F. Kuenstler, 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.

About 508,539 acres in Polk County was used for crops and pasture according to the 1982 Census of Agriculture preliminary report. Of that total, 209,020 acres was used as pasture and rangeland; more than 138,143 acres was used for citrus; and 5,000 acres was used for specialty crops, mainly cucumbers, watermelons, snap beans, peppers, some squash, field peas, sod nursery plants, grapes, blueberries, strawberries, tomatoes, and green boiling peanuts.

The acreage in crops, pasture, and woodland has been gradually decreasing as more land is used for urban development. At the completion of the survey, about 61,000 acres was being used for urban development. This acreage has increased at about 4 percent a year for the past 10 years according to estimates of the Central Florida Regional Planning Council.

Soil erosion caused by wind and water is a hazard on many soils in Polk County if the soil is not protected by a plant cover. The well drained Apopka soils, the moderately well drained Millhopper and Tavares soils, and the excessively drained Astatula and Candler soils that have slopes of more than 2 percent are susceptible to wind and water erosion. The somewhat poorly drained Sparr soils and poorly drained Smyrna, Myakka, and Immokalee soils are susceptible to wind erosion if they are not protected during the critical soil blowing period of January through April. Soil blowing also occurs on all cleared or scalped soils during the dry season from January through April. Future development or construction sites need to be temporarily protected from soil losses and offsite damages.

Loss of the surface layer through erosion is damaging because productivity is reduced as the surface layer is lost and as part of the subsoil is incorporated into the plow layer and because soil erosion on farmland results in sediment entering streams and lakes. If erosion is controlled, the pollution of streams and lakes by sediment can be reduced and the quality of water for municipal use, for recreation, and for fish and wildlife can be improved.

Erosion control practices reduce runoff, increase infiltration, and control soil blowing and water erosion. A plant cover on the soil reduces the rate of movement of water across the soil surface, thereby reducing the potential of runoff. Infiltration is enhanced by plant roots penetrating the surface and subsurface layers creating voids in which water can move downward. The plant cover holds the soil in place, reducing the potential of soil blowing and water erosion.

Other conservation practices that help control erosion are minimizing tillage and leaving crop residue on the surface. 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 soil. Legumes and grasses grown for forage help to control erosion on sloping soils, provide nitrogen, and improve soil tilth.

Conservation tillage leaves crop residue on the surface. The surface residue increases infiltration, reduces runoff, and helps to control erosion. Conservation tillage can be used on most of the soils in Polk County. No-tillage for citrus is effective in controlling erosion on sloping soils. No-tillage in citrus includes mowing, using herbicides under trees, and light disking that leaves enough plant residue on the surface to prevent erosion.

The soils in Polk County are so sandy and the slopes are so short and irregular that contour tillage or terracing is not practical. Diversions reduce the length of the slope and help to control runoff and erosion. They are practical on deep, well drained soils that have regular slopes.

Soil blowing is a major hazard on sandy and organic soils. It damages or destroys crops by sandblasting; spreads diseases, insects, and weed seeds; and creates health hazards and cleaning problems. In a few hours it can damage soils and tender crops in open, unprotected areas if the winds are strong and the soil is dry and bare of vegetation and surface mulch. Maintaining a plant cover or mulch on the surface minimizes soil blowing.

Soil blowing reduces soil fertility by removing the finer textured soil particles and organic matter from the soil. Control of soil blowing minimizes duststorms and improves air quality.

Field windbreaks of adapted trees and shrubs, such as cypress in its natural habitat and southern redcedar, and strip crops of small grains or other vegetables, such as large Florida sweet onions, effectively reduce crop damage from soil blowing. 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 on the susceptibility of the crop to damage from sandblasting.

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

Soil drainage is a concern in management on much of the acreage used for crops and pasture. The very poorly drained Eaton, Felda, Floridana, Nittaw, Placid, Myakka, Samsula, Kaliga, Holopaw, Hontoon, Basinger, Chobee, Winder, and Anclote soils are naturally so wet that the production of crops common to the area is generally not practical.

Unless the poorly drained soils are artificially drained, they are wet enough in the root zone to cause damage to most crops during the wet season. Included in this category are Basinger, EauGallie, Pomona, Lynne, Malabar, St. Johns, Smyrna, Myakka, Immokalee, Ona, Pompano, Wauchula, Felda, Oldsmar, Paisley, Wabasso, Bradenton, and Valkaria soils and clayey Haplaquents.

Unless some of the somewhat poorly drained soils are artificially drained, they are wet enough to cause damage to citrus crops during the wet season. Included in this category are Adamsville, Satellite, Sparr, Lochloosa, Electra, Narcoossee, and Zolfo soils. An irrigation system is needed on these soils for adequate crop production throughout the growing season.

The design of surface drainage and irrigation systems varies with the kind of soil and cropping system. For intensive pasture or hay production, a combination of these systems is needed. Information on the drainage and irrigation needed for each kind of soil and crop is available at the local office of the Soil Conservation Service.

Soil fertility is naturally low on most soils in Polk County. Most of the soils have a sandy, light colored surface layer low in organic matter. Apopka, Felda, Millhopper, and Sparr soils have a loamy subsoil. The Adamsville, Archbold, Astatula, Candler, and Tavares soils have sandy material to a depth of at least 80 inches. Basinger, Duette, Electra, Pomello, Ona, Smyrna, Myakka, Pomona, Wabasso, and EauGallie soils have a dark, sandy subsoil that is coated with organic matter.

Most of the soils in the county have a strongly acid or very strongly acid surface layer. Ground limestone is required to raise the pH level sufficiently for good growth of crops. The levels of nitrogen, potassium, and available phosphorus are naturally low in most of the soils. On all of the soils, additions of lime and fertilizer should be based on soil tests, the needs of the crop, and the expected level of yields. Fertilizer should be applied throughout the growing season. Split applications of fertilizer minimize nutrient loss. The Cooperative Extension Service can help determine the kind and amount of fertilizer and lime to apply.

Soil tilth is an important factor in the germination of seeds and in the infiltration of water into the soil. Soils that have good tilth are granular and porous. Adding organic matter to the soil improves the tilth.

Most of the soils in the county have a sandy surface layer that is low to moderate in content of organic matter. Some of the soils have a sandy, black or very dark gray surface layer that is moderate to very high in content of organic matter. Eaton, Anclote, Basinger, Hontoon, Kaliga, and Samsula soils have a muck or mucky fine sand surface layer that is very high in content of organic matter. The structure of the surface layer of most soils generally is weak. Most of the excessively drained and well drained soils are low or moderate in content of organic matter and are droughty. Returning crop residue to the soil improves soil structure and increases the moisture available to crops. Field crops are grown on a very small acreage in Polk County. The acreage of corn varies yearly and ranges from less than 100 acres to 400 acres. All of the corn harvested is used by the local cattle industry.

Specialty crops grown commercially are citrus, cherry tomatoes, watermelons, cucumbers, strawberries, boiling peanuts, sweet onions, peppers, squash, snap beans, grapes, blueberries, nursery plants, and sod. If economic conditions are favorable, the acreage of grapes, blueberries, nursery plants, and sod can be increased.

If irrigated, deep soils that have good natural drainage, such as Apopka and Candler soils on slopes of less than 5 percent, are especially well suited to small fruits. Well drained soils are well suited to peanuts. If irrigated, the Millhopper, Sparr, Tavares, and Zolfo soils are very well suited to citrus. If a water management system is installed, the Adamsville, Felda, Kaliga, Immokalee, Ona, Pompano, Smyrna, Myakka, Wabasso, and Wauchula soils are very well suited to vegetables.

The well drained and moderately well drained soils are suitable for citrus and nursery plants. Soils in low areas where air drainage is poor and frost pockets are common generally are poorly suited to early vegetables, small fruits, and citrus.

The latest information on specialty crops can be obtained from local offices of the Soil Conservation Service and the Cooperative Extension Service.

Pasture produces forage for beef and dairy cattle. Cow-calf operations are the major livestock enterprises. Bahiagrass and improved bermudagrass are the major pasture plants grown. Bahiagrass seeds are harvested and used for tame pasture plantings as well as for commercial purposes. In summer, excess pangolagrass and bermudagrass are harvested for feeding cattle in winter.

The well drained Apopka soils, the excessively drained Candler soils, and the moderately well drained Tavares soils are well suited to bahiagrass and improved bermudagrass. Under good management, hairy indigo and Alyce clover can be grown in summer and fall.

The somewhat poorly drained Adamsville, Sparr, and Zolfo soils are well suited to bahiagrass, improved bermudagrass, and legumes, such as clover and aeschynomene, but adequate lime and fertilizer are needed.

If a water management system is installed, Basinger, Bradenton, Felda, Immokalee, Ona, Pomona, Wauchula, Wabasso, Smyrna, Myakka, and Lynne soils are well suited to pastures of bahiagrass and limpograss. Irrigation increases the length of the growing season and the total forage production. Legumes, such as white clover and aeschynomene, are well suited if adequate amounts of lime and fertilizer are added to the soil.

In some parts of Polk County, pasture is greatly depleted by continuous excessive grazing. This is evidenced by invader plants, such as dogfennel, pawpaw, and ragweed. Yields of pasture forage are increased by applying a system of rotation grazing, adding lime and fertilizer, growing legumes, and using other management practices.

Pasture yields are closely related to the kind of soil. Management of pasture is based on the relationship of soils, pasture plants, lime, fertilizer, and moisture. The type of pasture is determined by soil characteristics. For example, some pastures require well drained soils, and others require poorly drained or somewhat poorly drained soils.

The latest information and current practices in pasture management can be obtained from the Soil Conservation Service and the Cooperative Extension Service.

Most of the land currently used as pasture in the southwest quadrant of the county will be mined for phosphate and eventually reclaimed. Much of the area will probably be reseeded to tame pasture grasses, such as bahiagrass.

Native range species, such as yellow indiangrass, switchgrass, and panic grass, are being planted on some of the reclaimed land. Pasture grasses, vegetables, and pine trees are being planted on an experimental basis on Arents and Neilhurst soils. Trial plantings of vegetable crops and some grasses are on Haplaquents. The major concern is water management, specifically maintaining adequate moisture on Arents and Neilhurst soils and removing excess water from Haplaquents during periods of heavy rainfall.

Expected yields for a suitable grass and legume under a high level of management are shown in table 5.

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 ensures the smallest possible loss.

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the crops grown, that good quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

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

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

Land Capability Classification

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

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

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

Class I soils have few limitations that restrict their use. There are no class I soils in Polk County.

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

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

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

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

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

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

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production. There are no class VIII soils in Polk County.

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

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

The 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."

Rangeland

Dennis Thompson, field office conservationist, Soil Conservation Service, helped prepare this section.

Rangeland is land on which the native vegetation is predominantly grasses, grasslike plants, forbs (broadleaf flowering plants), and shrubs. Rangeland covers about 200,000 acres of Polk County. It provides livestock with a significant part of their year-round forage needs. This forage is readily available and is economical for livestock producers. Rangeland also provides valuable wildlife habitat, watersheds, forest products, recreational opportunities, and scenic beauty. Most of the rangeland acreage is in the southeastern part of the county.

In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland are closely related to the kind of soil. Effective management is based on the relationship of the soils, vegetation, and water.

Table 7 shows, for each soil, the range site and the total annual production of vegetation in favorable, average, and unfavorable years. Only those soils that are used as rangeland are listed. Explanation of the column headings in table 7 follows.

A *range site* is a distinctive kind of rangeland that produces a characteristic climax plant community that differs from natural plant communities on other range sites in kind, amount, or proportion of range plants. The relationship between soils and vegetation was established during this survey; thus, range sites generally can be determined directly from the soil map. Soil properties that affect moisture supply and plant nutrients have the greatest influence on the productivity of range plants. Soil reaction, salt content, and a seasonal high water table are also important.

Potential annual production for kind of growing season is the amount of vegetation that can be expected to grow annually on well managed rangeland that is supporting the climax plant community. Potential production includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants, but it does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, average, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In an average year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture.

Range management requires a knowledge of the kinds of soil and of the potential climax plant community. It also requires an evaluation of the present range condition. Range condition is determined by comparing the present plant community with the climax plant community on a particular range site. The more closely the existing community resembles the climax community, the better the range condition. Range condition is an ecological rating only. It does not convey a meaning that pertains to the present plant community for a given use.

Range conditions are *excellent* if the range is producing 76-100 percent of the potential; *good* if the range is producing 51-75 percent of the potential; *fair* if the range is producing 26-50 percent of the potential; and *poor* if the range is producing less than 26 percent of the potential.

Native rangeland plants are classified in three categories according to their response to grazing. *Decreasers* generally are the most palatable plants to livestock and are eliminated if the range is under continuous heavy grazing. *Increasers* are plants less palatable to livestock; they increase for a short time under continuous heavy grazing but decrease if excessive grazing persists. *Invaders* are plants native to the site in small amounts but having little value as forage. They increase as the range site deteriorates from excessive grazing over a period of years.

The objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as the potential climax plant community for that site. Such management generally results in the optimum production of vegetation, reduction of undesirable brush species, conservation of water, and control of erosion. Sometimes, however, a range condition somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

Management of the range sites should be planned with the potential productivity in mind. The wettest soils, such as those in marshes, produce the most vegetation. The droughty, deep, sandy ridge soils generally produce the least herbage annually. Soils that have the highest production potential should be given the highest priority if economic considerations are important.

Major management considerations are livestock grazing, the length of time that the sites are grazed, and the length of time and the season that the sites are rested. Other management considerations are the grazing pattern of livestock in a pasture that contains more than one range site and the palatability of the dominant plants within the site. Manipulation of a range site often involves mechanical brush control, controlled burning, and controlled livestock grazing. Predicting the effects of these practices on range sites is important. Monitoring the range site condition allows the resource manager to determine the effects of range management practices on the current plant community. Proper management results in maximum sustained production, conservation of the soil and water resources, and improvement of the habitat for many wildlife species.

Woodland Management and Productivity

Cherry Wadsworth, county forester, Florida Division of Forestry, helped prepare this section.

Soils vary in their ability to produce trees. Depth, fertility, texture, and the available water capacity influence tree growth. Climate determines the kinds of trees that can grow on a site. Available water capacity and depth of the root zone are major influences of tree growth.

About 23 percent of the total land area in Polk County is woodland. It is about 17,000 acres of reserved woodland and 254,000 acres of commercial woodland. More than 81 percent of the commercial woodland is privately owned *(18)*.

Predominant commercial species are slash pine, South Florida slash pine, longleaf pine, sand pine, baldcypress, pondcypress, sweetbay, loblollybay gordonia, sweetgum, and blackgum. The pines are harvested mainly for pulpwood and sawtimber. Trees in wetlands produce fencing materials, sawtimber, and mulch.

Over 2.8 million cubic feet of wood was harvested in Polk County in 1984. Wood products generated an estimated total income for the county of more than $211,600,000 *(5)*.

The woodland in Polk County is diverse, ranging from flatwoods and swamps in the north, to sand hill scrub on the ridge in the east and reclaimed phosphate mines in the south.

The largest forestry operation in the county is in the extreme southeast corner on 50,000 acres of the Avon Park Air Force Bombing Range and 13,000 acres of state owned land adjacent to Lake Arbuckle. On the Air Force range, 15,000 acres is in planted pines ranging from 66 to 76 years old. The pines are under multiple use management, with grazing, wildlife, recreation, and timber being the principal uses. About 8,000 acres of natural South Florida slash pine and longleaf pine are on the bombing range. All stands are managed for natural regeneration with good results. Controlled burning of pine stands in 3-year cycles keeps the fire hazard at a minimum.

The tract on the west side of Lake Arbuckle is made up of sand hill scrub and slash pine flatwoods. It is managed for timber and wildlife on 10,000 acres and for recreation on 3,000 acres.

The area north of Interstate 4 is generally referred to as the Green Swamp. The predominant forest types in this area are natural longleaf-slash pine flatwoods and cypress-hardwood swamps. The Southwest Florida Water Management District owns about 19,403 acres in the part of the county along the Withlacoochee River and bordering Lake and Sumter Counties. Most of this acreage is natural longleaf-slash pine flatwoods and hardwood riverine forest.

These natural stands are well stocked. The principal management objectives on this tract are water management and conservation. Management activities are designed for maintenance and protection of the woodlands. Harvests are limited to salvage and sanitation cuts after fires, lightning strikes, and insect attacks. Prescribed burning every third year encourages natural regeneration, improves wildlife habitat and forage for cattle, and reduces the fire hazard.

Phosphate mining companies own or control almost 210,000 acres in southern Polk County. Wetland forests, pine flatwoods, and sand hill scrub are native to this part of the county. Mining has impacted these forest types. Mining regulations require acre for acre reclamation, with specific requirements as to the species and amounts to be planted. Efforts are being made to reforest parts of mined lands to each of the native forest types.

Timber generally is managed as a secondary resource in conjunction with cattle or citrus operations. More detailed information can be obtained at the local office of the Soil Conservation Service, the Florida Division of Forestry, or the County Extension Service.

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

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

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

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

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

Ratings of *equipment limitation* indicate limits on the use of forest management equipment, year-round or seasonal, because of such soil characteristics as slope, wetness, stoniness, or susceptibility of the surface layer to compaction. As slope gradient and length increase, it becomes more difficult to use wheeled equipment. The rating is *slight* if equipment use is restricted by soil wetness for less than 2 months and if special equipment is not needed. The rating is *moderate* if soil wetness restricts equipment use from 2 to 6 months per year, if stoniness restricts ground-based equipment, or if special equipment is needed to avoid or reduce soil compaction. The rating is *severe* if soil wetness restricts equipment use for more than 6 months per year, if stoniness restricts ground-based equipment, or if special equipment is needed to avoid or reduce soil compaction. Ratings of *moderate* or *severe* indicate a need to choose the most suitable equipment and to carefully plan the timing of harvesting and other management operations.

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

Ratings of *windthrow hazard* indicate the likelihood of trees being uprooted by the wind. Restricted rooting depth is the main reason for windthrow. Rooting depth can be restricted by a high water table or by a combination of such factors as soil wetness, texture, and structure. The risk is *slight* if strong winds cause trees to break but do not uproot them; *moderate* if strong winds cause an occasional tree to be blown over and many trees to break; and *severe* if moderate or strong winds commonly blow trees over. Ratings of *moderate* or *severe* indicate the need for care in thinning or possibly not thinning. Specialized equipment may be needed to avoid damage to shallow root systems in partial cutting operations. A plan for periodic salvage of windthrown trees and the maintenance of a road and trail system may be needed.

Ratings of *plant competition* indicate the likelihood of the growth or invasion of undesirable plants. Plant competition becomes more severe on the more productive soils, on poorly drained soils, and on soils having a restricted root zone that holds moisture. The risk is *slight* if competition from undesirable plants inhibits adequate natural or artificial reforestation but does not necessitate intensive site preparation and maintenance. The risk is *moderate* if competition from undesirable plants inhibits natural or artificial reforestation to the extent that intensive site preparation and maintenance are needed. The risk is *severe* if competition from undesirable plants prevents adequate natural or artificial reforestation unless the site is intensively prepared and maintained. A *moderate* or *severe* rating indicates the need for site preparation to ensure the development of an adequately stocked stand. Managers must plan site preparation measures to ensure reforestation without delays.

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

For the soils that are commonly used to produce timber, the yield is predicted in cubic meters. The yield is predicted at the point where mean annual increment culminates.

The *site index* is determined by taking height measurements and determining the age of selected trees within stands of a given species. This index is the average height, in feet, that the trees attain in a specified number of years. This index applies to fully stocked, even-aged, unmanaged stands. The site index values given in table 8 are based on standard procedures and techniques *(12, 17, 20)*.

The *productivity class* represents an expected volume produced by the most important trees, expressed in cubic meters per hectare per year. Cubic meters per hectare can be converted to cubic feet per acre by multiplying by 14.3. Cubic feet can be converted to board feet by multiplying by a factor of about 5. For example, a productivity class of 8 means the soil can be expected to produce 114 cubic feet per acre per year at the point where mean annual increment culminates, or about 570 board feet per acre per year.

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

Windbreaks and Environmental Plantings

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

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

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

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

Recreation

Polk County offers a variety of recreational activities, including fishing, hunting, swimming, boating, canoeing, and camping. Several freshwater lakes provide excellent fishing. The Avon Park Air Force Range and the Tenoroc Game Preserve provide excellent hunting for deer, turkey, and feral hogs. Quail are also hunted. Many of the freshwater lakes near population centers have facilities for swimming, and boat docking facilities are available at many of the major lakes. The scenic Peace River is excellent for canoeing. Lake Kissimmee State Park has facilities for overnight camping as well as for fishing and boating.

In table 9, the soils of the survey area are rated according to the limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreational use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 9, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations, if any, 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 by soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 9 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 12 and interpretations for dwellings without basements and for local roads and streets in table 11.

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

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

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

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

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

Wildlife Habitat

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

The soils in Polk County support a wide diversity of plant communities that are productive for a variety of wildlife species. Primary ecological communities include the lakes, marshes, swamp forests, pine flatwoods, sand hills, sand pine scrub, oak hammock, and wetland hardwood hammock.

Game species include white-tailed deer, wild turkey, quail, fox squirrels, gray squirrels, cottontails, marsh rabbits, dove, and several species of ducks. Nongame species include raccoon, opossum, armadillo, red fox, gray fox, Florida black bears, feral hogs, bobcat, otter, mink, skunks, and a variety of songbirds, woodpeckers, wading birds, predatory birds, reptiles, and amphibians. Some of the most valuable habitat is the Green Swamp area in the northern part of the county; the Kissimmee River, Chain of Lakes, and Avon Park Bombing Range in the eastern and southern parts; and the old phosphate mine pits in the western and south-central parts. The pits provide good habitat for waterfowl, wading birds, otter, alligator, and fish. Bald eagles, wood storks, white pelicans, Florida sandhill cranes, and osprey are often seen in these areas.

Areas of concern are the impact of urbanization in the central part of the county; the habitat changes caused by intensive agricultural practices, such as citrus and tame pasture; and the phosphate mining with the monoculture type of reclamation that has been done in the past. Present reclamation laws and rules require that a diversity of land uses and plant covers be reestablished during reclamation.

Polk County provides much fishery habitat with its streams, swamps, marshes, and lakes. The 536 natural lakes are more than 10 acres in size, and 110 of these lakes are larger than 100 acres. Many lakes offer excellent fishing. In some urban areas, however, overenrichment of lakes results in fish kills. The main species include largemouth bass, bluegill, speckled perch (black crappie), redear sunfish, redbreast sunfish, spotted sunfish, and catfish. Other prominent species include gar, bowfin, lake chubsuckers, tilapia, and gizzard shad.

A number of endangered and threatened wildlife species are in Polk County. They range from the seldom-seen red-cockaded woodpecker and short-tailed snake to more common species, such as the wood stork and bald eagle. A more detailed list of these species with information on range and habitat needs is available from the district conservationist at the local office of the Soil Conservation Service.

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

In table 10, 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, browntopmillet, 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 grasses, goldenrod, beggarweed, partridge pea, and ragweed.

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

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

Wetland plants are annual and perennial, wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, pickerelweed, 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 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 rabbit, 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, herons, shore birds, otter, mink, and alligator.

Engineering

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

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

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

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

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

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

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

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

Building Site Development

Table 11 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, if any, are minor and easily overcome; *moderate* if soil properties or site features are somewhat restrictive 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 that special design, soil reclamation, 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 very firm dense layer, stone content, soil texture, and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

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

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized 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. A high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, depth to a high water table, 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 12 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, if any, are minor and easily overcome; *moderate* if soil properties or site features are moderately favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if one or more soil properties or site features are unfavorable for the use and special design, extra maintenance, or alteration are required to overcome the unfavorable properties.

Table 12 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and that good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, depth to a high water table, 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 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 12 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, depth to a high water table, flooding, large stones, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope 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 12 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

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

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

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 13 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

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

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

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

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

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 13, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

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

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

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

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

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are 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, and soils that have an appreciable amount of gravel, stones, or soluble salts. 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, or have a seasonal water table at or near the surface.

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

Water Management

Table 14 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, if any, are minor and are easily overcome; *moderate* if soil properties or site features are somewhat restrictive 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 unfavorable for the use. Special design, possibly increased maintenance, or alteration is required.

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

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to permeable material.

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

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

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

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and the salinity of the soil. 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 layers that affect the rate of water movement, permeability, depth to a high water table or depth of standing water if the soil is subject to ponding, slope, susceptibility to flooding, and subsidence of organic layers. Excavating and grading and the stability of ditchbanks are affected by large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

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

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, and large stones affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of soil blowing or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, and slope affect the construction of grassed waterways. A hazard of soil blowing, low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics. These results are reported in table 22.

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 15 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 22.

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

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

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

Physical and Chemical Properties

Table 16 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

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

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They influence the soil's adsorption of cations, moisture retention, shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

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

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

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

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

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

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

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

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion. Losses are expressed in tons per acre per year. These estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

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

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

1. Sands, coarse sands, fine sands, and very fine sands. They are extremely erodible, and vegetation is difficult to establish.

2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, and sapric organic soils. These soils are very highly erodible. Crops can be grown if intensive measures to control soil blowing are used.

3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control soil blowing are used.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams. These soils are erodible. Crops can be grown if intensive measures to control soil blowing are used.

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

5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic organic soils. These soils are slightly erodible. Crops can be grown if measures to control soil blowing are used.

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

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

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

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

In table 16, 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 17 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

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

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

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

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

In table 17, some soils are assigned to two hydrologic soil groups. Soils that have a seasonal high water table but can be drained are assigned first to a hydrologic group that denotes the drained condition of the soil and then to a hydrologic group that denotes the undrained condition, for example, B/D. Because there are different degrees of drainage and water table control, onsite investigation is needed to determine the hydrologic group of the soil in a particular location.

Flooding, the temporary covering of the soil surface by flowing water, is caused by overflowing streams, by runoff from adjacent slopes, or by inflow from high tides. Shallow water standing or flowing for short periods after rainfall or snowmelt is not considered flooding. Standing water in swamps and marshes or in a closed depression is considered ponding.

Table 17 gives the frequency and duration of flooding and the time of year when flooding is most likely to occur.

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

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

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

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 17 are the depth to the seasonal high water table; the kind of water table, that is, *perched* or *apparent;* and the months of the year that the water table commonly is highest. A water table that is seasonally high for less than 1 month is not indicated in table 17.

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

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

Table 18 shows depths to the water table based on bimonthly measurements taken on two soils in Polk County from 1977 through 1986.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. Table 17 shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

Not shown in the table is subsidence caused by an imposed surface load or by the withdrawal of ground water throughout an extensive area as a result of lowering the water table.

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

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

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

Physical, Chemical, and Mineralogical Analyses of Selected Soils

Dr. Victor W. Carlisle, professor, and Dr. W.G. Harris, assistant professor, Soil Science Department, University of Florida, helped prepare this section.

Parameters for physical, chemical, and mineralogical properties of representative pedons sampled in Polk County are presented in tables 19, 20, and 21. The analyses were conducted and coordinated by the Soil Characterization Laboratory at the University of Florida. Detailed profile descriptions of analyzed soils are given in alphabetical order in the section "Classification of the Soils." Laboratory data and profile information for additional soils in Polk County, as well as for other counties in Florida, are on file at the University of Florida, Soil Science Department.

Typifying pedons were sampled from pits at carefully selected locations. Samples were air dried, crushed, and sieved through a 2-millimeter screen. Most analytical methods used are outlined in Soil Survey Investigations Report No. 1 *(19)*.

Particle-size distribution was determined using a modified pipette method with sodium hexametaphosphate dispersion. Hydraulic conductivity and bulk density were determined on undisturbed soil cores. Water retention parameters were obtained from duplicate undisturbed soil cores placed in tempe pressure cells. Weight percentages of water retained at 100 centimeters water (1/10 bar) and 345 centimeters water (1/3 bar) were calculated from volumetric water percentages divided by bulk density. Samples were oven dried and ground to pass a 2-millimeter sieve, and the 15-bar water retention was determined. Organic carbon was determined by a modification of the Walkley-Black wet combustion method.

Extractable bases were obtained by leaching soils with normal ammonium acetate buffered at pH 7.0. Sodium and potassium in the extract were determined by flame emission. Calcium and magnesium were determined by atomic absorption spectrophotometry. Extractable acidity was determined by the barium chloride-triethanolamine method at pH 8.2. Cation-exchange capacity was calculated by adding the values for extractable bases and extractable acidity. Base saturation is the ratio of extractable bases to cation-exchange capacity expressed in percent. The pH measurements were made with a glass electrode using a soil-water ratio of 1:1; a 0.01 molar calcium chloride solution in a 1:2 soil-solution ratio; and normal potassium chloride solution in a 1:1 soil-solution ratio.

Electrical conductivity determinations were made with a conductivity bridge on 1:1 soil to water mixtures. Iron and aluminum extractable in sodium dithionite-citrate were determined by atomic absorption spectrophotometry. Aluminum, carbon, and iron were extracted from probable spodic horizons with 0.1 molar sodium pyrophosphate. Determination of aluminum and iron was by atomic absorption, and determination of extracted carbon was by the Walkley-Black wet combustion method.

Mineralogy of the clay fraction less than 2 microns was ascertained by x-ray diffraction. Peak heights at 18-, 14-, 10-, 7.2-, 4.83-, and 4.31-angstrom positions represent montmorillonite, interstratified expandable vermiculite or 14-angstrom intergrades, mica, kaolinite, gibbsite, and quartz, respectively. Peaks were measured, summed, and normalized to give the percent of soil minerals identified in the x-ray diffractograms. These percentage values do not indicate absolute determined quantities of soil minerals but do imply a relative distribution of minerals in a particular mineral suite. Absolute percentages would require additional knowledge of particle size, crystallinity, unit structure substitution, and matrix problems.

Physical Properties

Soils sampled for laboratory analyses in Polk County were inherently very sandy (table 19). Some had an argillic horizon in the lower part of the solum. Total sand content exceeded 90 percent in one horizon or more in all soils. Archbold, Astatula, Candler, Myakka, Satellite, Tavares, and Zolfo soils contained more than 92 percent total sand to a depth of more than 2 meters. One horizon in Narcoossee soil contained less than 90 percent total sand. Apopka, Millhopper, Ona, Pomona, and Sparr soils contained more than 90 percent total sand to a depth of slightly more than 1 meter.

Clay content in these excessively sandy horizons was rarely more than 2 percent. Deeper argillic horizons in the Apopka, Lynne, Millhopper, Pomona, Sparr, and Wabasso soils contained enhanced amounts of clay ranging from 14.2 to 45.5 percent.

Silt content exceeded 10 percent in one horizon or more of the Kaliga, Ona, and Pomona soils but rarely exceeded 5 percent in all other soils.

Fine sand dominated the sand fractions in most soils; however, medium sand was dominant in the Archbold, Candler, Immokalee, and Satellite soils. All horizons of Tavares soil contained in excess of 70 percent fine sand. Very coarse sand was barely detectable in many soils and totally absent in Archbold, Candler, Kaliga, Millhopper, Myakka, Narcoossee, Ona, Samsula, Satellite, and Tavares soils. The content of coarse sand was less than 1 percent in Ona and Tavares soils and less than 2 percent in Apopka, Millhopper, Myakka, Narcoossee, Pomona, and Zolfo soils. The content of very fine sand ranged from 0.2 percent in the Btg horizon of Sparr soils to 21.5 percent in the E′2 horizon of Pomona soils. Sandy soils in Polk County rapidly become droughty during periods of low precipitation when rainfall is widely scattered. Conversely, they are rapidly saturated when high amounts of rainfall occur.

Hydraulic conductivity values ranged widely from negligible amounts to more than 100 centimeters per hour. The highest values generally were representative of the moderately well drained to excessively drained sands, and the lowest values were representative of deeper argillic horizons. The higher clay content in Lynne and Wabasso soils resulted in low hydraulic conductivity values at depths that could affect the design and function of septic tank absorption fields. Hydraulic conductivity values of less than 10 centimeters per hour were recorded for spodic horizons in Immokalee, Lynne, Myakka, Pomona, Wabasso, and Zolfo soils and the deeper spodic horizon of Ona soils. The hydraulic conductivity values for the Bh horizon in the Narcoossee soils were higher than those generally recorded for spodic horizons in most soils in Florida. The available water for plants can be estimated from bulk density and water content data. Soils that have an excessive content of sand, such as Archbold, Astatula, Candler, and Tavares soils, retain very low amounts of available water. Conversely, soils that have a higher amount of fine-textured material or a higher content of organic matter, such as Kaliga and Samsula mucks, retain much larger amounts of available water.

Chemical Properties

Chemical soil properties (table 20) show that a wide range of extractable bases are in the soils of Polk County. All soils sampled had one horizon or more that had less than 1 milliequivalent per 100 grams extractable bases. Archbold, Astatula, Sparr, and Tavares soils contained less than 1 milliequivalent per 100 grams extractable bases throughout the pedons. The highest amounts of extractable bases generally occurred in horizons that had a high content of clay or organic carbon. The mild, humid climate of Polk County results in the depletion of basic cations (calcium, magnesium, sodium, and potassium) through leaching.

Calcium was the dominant base in all of the soils of Polk County; however, more magnesium than calcium occurred in some of the deeper horizons of the Kaliga, Lynne, Narcoossee, and Pomona soils. All of the soils sampled except Archbold, Astatula, Millhopper, Myakka, Narcoossee, Sparr, and Tavares soils contained one horizon or more in which the calcium content exceeded 2 milliequivalents per 100 grams. The content of extractable magnesium of 2 milliequivalents or more occurred in one horizon or more of the Kaliga, Lynne, and Ona soils. The highest amounts of both calcium and magnesium occurred in Kaliga soil. Sodium generally occurred in amounts that were much less than 0.3 milliequivalents per 100 grams; however, only the upper horizons of Kaliga muck and Samsula muck exceeded this amount. Most of the soils contained much less than 0.24 milliequivalents per 100 grams extractable potassium; however, one horizon or more in Ona, Samsula, and Wabasso soils exceeded this amount. Immokalee, Myakka, Pomona, Samsula, and Satellite soils had horizons with nondetectable amounts of potassium.

Values for cation-exchange capacity, an indicator of plant nutrient-holding capacity, exceeded 10 milliequivalents per 100 grams in the surface layer of Fort Meade, Immokalee, Kaliga, Lynne, Millhopper, Narcoossee, Ona, Pomona, and Samsula soils. A large cation-exchange capacity paralleled the higher clay content in deeper horizons of Apopka, Lynne, Millhopper, and Wabasso soils. Soils, such as Archbold sand, that have a low cation-exchange capacity in the surface layer require only small amounts of lime or sulfur to significantly alter the base status and soil reaction. Generally, soils of low inherent soil fertility are associated with low values for extractable bases and low cation-exchange capacity. Fertile soils are associated with high extractable base values, high base saturation values, and high cation-exchange capacities.

The content of organic carbon was less than 1 percent throughout Apopka, Archbold, Astatula, Candler, Millhopper, Sparr, Tavares, and Wabasso soils. Only Kaliga and Samsula soils contained more than 5 percent organic carbon. Immokalee, Lynne, Myakka, Narcoossee, Ona, Pomona, Wabasso, and Zolfo soils had a Bh horizon with large amounts of organic carbon that range from 0.23 percent in Zolfo soil to 2.91 percent in Immokalee soil. In the other soils, the content of organic carbon decreased rapidly as depth increased. Since the content of organic carbon in the surface layer is directly related to soil nutrient- and water-holding capacities of sandy soils, management practices that conserve and maintain the amounts of organic carbon are highly desirable.

Electrical conductivity values were all very low, generally less than 0.20 millimhos per centimeter; however, several horizons in a few soils exceeded this value somewhat. These data indicate that the content of soluble salt in soils sampled in Polk County was insufficient to detrimentally affect the growth of salt-sensitive plants.

Soil reaction in water ranged from pH 3.4 in the surface layer of the Narcoossee soil to pH 7.1 in the surface layer of the Satellite soil. Values for soil reaction were frequently 0.2 to 0.8 pH units lower when determined in potassium chloride and calcium chloride solutions than when determined in water. The maximum plant nutrient availability is generally attained when soil reaction is between pH 6.5 and 7.5; however, under Florida conditions, maintaining soil reaction at these levels is not economically feasible for most agricultural production purposes.

The ratio of pyrophosphate extractable carbon and aluminum to clay in the Bh horizon of Immokalee, Lynne, Myakka, Narcoossee, Ona, Pomona, Wabasso, and Zolfo soils was sufficient to meet the chemical criteria for the spodic horizons. Pyrophosphate extractable iron and aluminum ratio to citrate-dithionite extractable iron and aluminum was also sufficient to meet spodic horizon criteria. Sodium pyrophosphate extractable iron was 0.06 percent or less in the spodic horizon in all of these soils.

Citrate-dithionite extractable iron in the Bt horizon of Apopka, Lynne, Millhopper, Pomona, Sparr, and Wabasso soils ranged from 0.06 to 3.70 percent but was generally less than 1 percent. Aluminum extracted by citrate-dithionite from the Bt horizon in these soils ranged from 0.01 to 0.51 percent. Larger amounts of citrate-dithionite iron generally occurred in the Bt horizon as compared to the Bh horizon. The amounts of iron and aluminum in soils in Polk County were not sufficient to detrimentally affect phosphorus availability.

Mineralogical Properties

Sand fractions of 2.0 to 0.05 millimeters were siliceous, and quartz was overwhelmingly dominant in all pedons. Small amounts of heavy minerals were in most horizons with the greatest concentration in the very fine fraction. No weatherable minerals were observed. Crystalline mineral components of the clay fraction of less than 0.002 millimeters are shown in table 21 for major horizons of the pedons sampled. The clay mineralogical suite was composed mostly of montmorillonite, a 14-angstrom intergrade, kaolinite, gibbsite, quartz, and mica.

Montmorillonite occurred in the Archbold, Astatula, Immokalee, Kaliga, Millhopper, Myakka, Narcoossee, Ona, Samsula, Satellite, Tavares, and Wabasso soils. Montmorillonite was not detected in Apopka, Candler, Fort Meade, Lynne, Pomona, Sparr, and Zolfo soils. The 14-angstrom intergrade mineral was detected in all soils except Immokalee sand. Except for the A horizon of Narcoossee soil, the B'h1 horizon of Ona soil, the Ap horizon of Pomona soil, and the C2 horizon of Satellite soil, kaolinite occurred in all other horizons for which determinations for clay identification were performed. Gibbsite was detected only in the Apopka and Pomona soils. Varying amounts of quartz occurred in all pedons. Mica occurred only in the Archbold soil. Immokalee, Narcoossee, Ona, Satellite, and Wabasso soils had horizons with detectable feldspar, but the quantity was too low for assignment of numerical values.

Montmorillonite in soils in Polk County was generally inherited from the sediments in which these soils have formed. The stability of montmorillonite is generally favored by alkaline conditions. Montmorillonite frequently occurs in areas where alkaline elements have not been leached by percolation rainwater, such as soils saturated with limestone-influenced ground water.

The 14-angstrom intergrade, a mineral of uncertain origin, is widespread in soils in Florida. It tends to be most prevalent under moderately acidic, relatively well drained conditions, although it occurs in a variety of soil environments. It is a major constituent of sand grain coatings in the brownish yellow, excessively drained, sandy soils of Polk County.

Kaolinite may have been inherited from the parent material, or it may have formed as a weathering product of other minerals. It is relatively stable in the acidic soil environments of soils in Polk County. Clay-size quartz has primarily resulted from decrements of the silt fraction.

Clay mineralogy can have a significant impact on soil properties, particularly for soils that have a higher content of clay. Soils that contain montmorillonite have a higher capacity for plant nutrient retention than soils dominated by kaolinite, 14-angstrom intergrade minerals, and quartz. Large amounts of montmorillonitic clays can create problems for most types of construction because of the large amounts of swelling when the clay is wet and shrinking when it is dry. In most soils in Polk County, the clay mineralogy influences use and management less frequently than the total content of clay.

Engineering Index Test Data

Table 22 shows engineering index test data for some of the major soils in the county. The data were determined by the Soils Laboratory, Bureau of Materials and Research, Florida Department of Transportation, 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 limits and plastic limits.

The mechanical analyses were made by a combined sieve and hydrometer method *(4)*. The various grain-size fractions were calculated on the basis of all the material in the soil sample, including that coarser than 2 millimeters in diameter. These mechanical analyses should not be used in naming textural classes of soils.

Liquid limit and plasticity index indicate the effect of water on the strength and consistence of the soil material. As the moisture content of a clayey soil is increased from a dry state, the material changes from semisolid to plastic.

If the moisture content is further increased, the material changes from plastic to liquid. The plastic limit is the moisture content at which the soil material changes from semisolid to plastic, and the liquid limit is the moisture content at which the soil material changes from plastic to liquid. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which soil material is plastic. The data on liquid limit and plasticity index in table 22 are based on laboratory tests of soil samples.

Compaction (or moisture-density) data are important in earthwork. If soil material is compacted at a successively higher moisture content, assuming that the compactive effort remains constant, the density of the compacted material increases until the optimum moisture content is reached. After that, density decreases with an increase in moisture content. The highest dry density obtained in the compactive test is termed maximum dry density. As a rule, maximum strength of earthwork is obtained if the soil is compacted to the maximum dry density.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(16)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or on laboratory measurements. Table 23 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

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

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

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

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

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

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

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the *Soil Survey Manual (15)*. Many of the technical terms used in the descriptions are defined in *Soil Taxonomy (16)*. 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."

Adamsville Series

The Adamsville series consists of somewhat poorly drained soils that formed in sandy marine sediments. These soils are on low ridges on flatwoods and in low areas on uplands. Slopes are 0 to 2 percent. These soils are hyperthermic, uncoated Aquic Quartzipsamments.

The Adamsville soils are associated on the landscape with Basinger, Immokalee, Myakka, Smyrna, and Tavares soils. Basinger, Immokalee, Myakka, and Smyrna soils have a Bh horizon and are poorly drained. Tavares soils are moderately well drained.

Typical pedon of Adamsville fine sand; 750 feet west and 1,100 feet south of the northeast corner of sec. 22, T. 26 S., R. 27 E.

A—0 to 6 inches; very dark gray (10YR 3/1) fine sand; weak fine granular structure; very friable; slightly acid; clear smooth boundary.

C1—6 to 24 inches; light yellowish brown (10YR 6/4) fine sand; single grained; loose; slightly acid; gradual wavy boundary.

C2—24 to 32 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; slightly acid; gradual smooth boundary.

C3—32 to 41 inches; brown (10YR 5/3) fine sand; few fine distinct brownish yellow (10YR 6/6) mottles; single grained; loose; slightly acid; gradual wavy boundary.

C4—41 to 80 inches; very pale brown (10YR 7/3) fine sand; single grained; loose; slightly acid.

Reaction is very strongly acid to mildly alkaline.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1, or value of 4 and chroma of 2. It is 4 to 9 inches thick.

The C horizon has hue of 10YR, value of 5 to 7, and chroma of 1 to 3, or value of 6 and chroma of 4. In some pedons, the lower part of this horizon has value of 8 and chroma of 1 or 2. Texture is sand or fine sand.

Anclote Series

The Anclote series consists of very poorly drained soils that formed in sandy marine sediments. These soils are in depressional areas mostly around lakes throughout the lake section of the county. Slopes are 0 to 2 percent. These soils are sandy, siliceous, hyperthermic Typic Haplaquolls.

Anclote soils are associated on the landscape with the Basinger, Chobee, Felda, Floridana, Pompano, and Samsula soils. Chobee, Felda, and Floridana soils have a Bt horizon. Basinger and Pompano soils have an ochric epipedon. Samsula soils are organic.

Typical pedon of Anclote mucky fine sand, depressional; about 800 feet north and 600 feet west of the southeast corner of sec. 32, T. 29 S., R. 26 E.

A1—0 to 8 inches; black (10YR 2/1) mucky fine sand; weak fine granular structure; friable; many fine roots; slightly acid; clear smooth boundary.

A2—8 to 18 inches; very dark gray (10YR 3/1) fine sand; weak fine granular structure; friable; common fine and few medium roots; neutral; clear wavy boundary.

Cg1—18 to 60 inches; gray (10YR 6/1) fine sand; single grained; loose; neutral; clear wavy boundary.

Cg2—60 to 80 inches; dark gray (10YR 4/1) fine sand; single grained; loose; neutral.

Reaction ranges from strongly acid to moderately alkaline. Texture below the mucky fine sand surface layer includes sand, fine sand, loamy sand, or loamy fine sand.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2; has hue of 2.5Y, value of 3, and chroma of 2; or is neutral and has value of 2 or 3. This horizon is 10 to 24 inches thick.

The Cg horizon has hue of 10YR or 5Y, value of 4 to 6, and chroma of 2 or less. Mottles in shades of yellow or brown are in some pedons. This horizon has chroma of 1 or less in pedons that do not have mottles.

Apopka Series

The Apopka series consists of well drained soils that formed in sandy and loamy marine deposits. These soils are on uplands and knolls on flatwoods. Slopes range from 0 to 5 percent. These soils are loamy, siliceous, hyperthermic Grossarenic Paleudults.

Apopka soils are associated on the landscape with Candler, Fort Meade, Kendrick, Millhopper, and Sparr soils. Candler soils have lamellae and are excessively drained. Fort Meade soils have an umbric epipedon. Kendrick soils have loamy material within a depth of 40 inches. Millhopper soils are moderately well drained, and Sparr soils are somewhat poorly drained.

Typical pedon of Apopka fine sand, 0 to 5 percent slopes; 1,500 feet east and 1,000 feet south of the northwest corner of sec. 16, T. 29 S., R. 24 E.

Ap—0 to 7 inches; very dark gray (10YR 3/1) fine sand; weak fine granular structure; very friable; many fine and medium roots; neutral; clear smooth boundary.

E1—7 to 21 inches; pale brown (10YR 6/3) fine sand;

single grained; loose; many fine and medium roots; strongly acid; gradual wavy boundary.

E2—21 to 35 inches; very pale brown (10YR 7/4) fine sand; single grained; loose; many fine and medium roots; strongly acid; gradual wavy boundary.

E3—35 to 51 inches; very pale brown (10YR 7/4) fine sand; single grained; loose; many fine and medium roots; few yellow (10YR 7/6) loamy fine sand lamellae in the lower part of horizon; strongly acid; clear wavy boundary.

Bt1—51 to 61 inches; brownish yellow (10YR 6/8) fine sandy loam; few medium prominent red (2.5YR 4/6) sandy clay loam mottles; weak medium subangular blocky structure; friable; common fine and medium roots; sand grains coated and bridged with clay; very strongly acid; clear wavy boundary.

Bt2—61 to 80 inches; red (2.5YR 4/6) sandy clay; many coarse prominent yellow (10YR 7/8) and light gray (10YR 7/1) mottles; moderate subangular blocky structure; firm; few fine roots; thin patchy clay films on faces of peds and walls of pores; sand grains coated and bridged with clay; very strongly acid.

The solum is more than 60 inches thick. Reaction ranges from very strongly acid to medium acid except where lime has been added to the soil.

The A or Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It is 5 to 7 inches thick.

The E horizon has hue of 10YR, value of 5 to 8, and chroma of 3 to 8. It is 36 to 47 inches thick. Texture is fine sand or sand.

The Bt horizon has hue of 2.5YR to 10YR, value of 4 to 6, and chroma of 4 to 8. Mottles are mostly in shades of yellow and red, but light gray mottles occur at a depth of more than 60 inches. Texture ranges from sandy loam to sandy clay. Sandy clay is in the lower part of the horizon only, generally at a depth of more than 60 inches.

Archbold Series

The Archbold series consists of moderately well drained soils that formed in sandy marine or eolian deposits. These soils are on uplands and knolls on flatwoods. Slopes range from 0 to 5 percent. These soils are hyperthermic, uncoated Typic Quartzipsamments.

Archbold soils are associated on the landscape with Basinger, Duette, Placid, Satellite, and St. Lucie soils. Duette soils are in about the same position on the landscape as the Archbold soils, and they have a Bh horizon. Basinger soils are in wet depressions and sloughs adjacent to Archbold soils. Placid soils are in wet depressions and have a thick, black or very dark gray surface layer. Satellite soils are wetter than Archbold soils. Also, they are on the lower knolls and ridges. St. Lucie soils are on the slightly higher ridges and have a deeper water table.

Typical pedon of Archbold sand, 0 to 5 percent slopes; 0.5 mile south and 100 feet east of the northwest corner of sec. 5, T. 30 S., R. 29 E.

A—0 to 4 inches; gray (10YR 5/1) sand; salt-and-pepper appearance; single grained; loose; many fine, medium, and coarse roots; very strongly acid; clear smooth boundary.

C—4 to 80 inches; white (10YR 8/1) sand; single grained; loose; many fine and medium roots to a depth of 40 inches and few fine roots from 40 to 80 inches; few fine prominent brown (10YR 5/3) stains along root channels; very strongly acid.

Sand extends to a depth of more than 80 inches. Reaction ranges from extremely acid to strongly acid.

The A horizon has hue of 10YR, value of 4 to 6, and chroma of 1. It is 1 to 4 inches thick.

The C horizon has hue of 10YR, value of 6 to 8, and chroma of 1 or 2. In some pedons, it has stains along old root channels.

Astatula Series

The Astatula series consists of excessively drained soils that formed in sandy marine sediments. These soils are on sandy upland ridges. Slopes range from 0 to 8 percent. These soils are hyperthermic, uncoated Typic Quartzipsamments.

Astatula soils are associated on the landscape with Candler, St. Lucie, and Tavares soils. Candler soils have lamellae within a depth of 80 inches. St. Lucie soils have low chroma in the C horizon. Tavares soils are moderately well drained.

Typical pedon of Astatula sand, 0 to 8 percent slopes; 400 feet east and 200 feet south of the northwest corner of sec. 32, T. 30 S., R. 29 E.

Ap—0 to 7 inches; dark gray (10YR 4/1) sand; single grained; loose; many fine and few medium roots; very strongly acid; clear wavy boundary.

C1—7 to 64 inches; light yellowish brown (10YR 6/4) sand; single grained; loose; many fine and very fine roots; strongly acid; clear wavy boundary.

C2—64 to 80 inches; very pale brown (10YR 7/4) sand; single grained; loose; very strongly acid.

Reaction ranges from very strongly acid to slightly acid. Texture is sand or fine sand throughout.

The A horizon has hue of 10YR, value of 3 to 6, and chroma of 1 or 2; has hue of 2.5Y, value of 4 or 5, and chroma of 2; or is neutral and has value of 5 or 6. This horizon is 2 to 7 inches thick.

The C horizon has hue of 5YR to 10YR, value of 5 to 7, and chroma of 3 to 8.

Basinger Series

The Basinger series consists of poorly drained and very poorly drained soils that formed in sandy marine sediments. These soils are in sloughs and depressions on flatwoods. Slopes are 0 to 2 percent. These soils are siliceous, hyperthermic Spodic Psammaquents.

Basinger soils are associated on the landscape with EauGallie, Immokalee, Myakka, Placid, and Wabasso soils. All of these soils except the Placid soils have a spodic Bh horizon. Placid soils have a thick, black or very dark gray A horizon.

Typical pedon of Basinger fine sand; in a pasture, 1,250 feet north and 1,150 feet west of the southeast corner of sec. 19, T. 29 S., R. 26 E.

Ap—0 to 7 inches; dark gray (10YR 4/1) fine sand; weak fine granular structure; many fine roots; medium acid; abrupt smooth boundary.

E—7 to 19 inches; light gray (10YR 7/2) fine sand; single grained; loose; few fine and medium roots; strongly acid; clear wavy boundary.

Bh/E—19 to 39 inches; brown (10YR 4/3) (Bh) and light brownish gray (10YR 6/2) (E) fine sand; single grained; loose; very strongly acid; gradual wavy boundary.

C—39 to 80 inches; light brownish gray (10YR 6/2) fine sand; single grained; loose; very strongly acid.

Sand extends to a depth of more than 80 inches. Reaction ranges from extremely acid to neutral. Texture generally is sand or fine sand, but the surface layer is fine sand or mucky fine sand.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1, or it is neutral in hue and has value of 2. This horizon is 2 to 8 inches thick.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. It is 5 to 30 inches thick.

The Bh part of the Bh/E horizon has hue of 10YR, value of 4 or 5, and chroma of 3. The E part has a similar range in colors as that of the E horizon. Mottles or weakly cemented bodies having hue of 5YR, value of 2, and chroma of 2 are in some pedons. The Bh/E horizon is 6 to 25 inches thick.

The C horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2.

Bradenton Series

The Bradenton series consists of poorly drained soils that formed in loamy marine sediments influenced by calcareous material. These soils are on flatwoods and on cabbage palm and wetland hardwood hammocks. Slopes are 0 to 2 percent. These soils are coarse-loamy, siliceous, hyperthermic Typic Ochraqualfs.

Bradenton soils are associated on the landscape with Chobee, Felda, Pomona, and Wabasso soils. Chobee soils are very poorly drained and have a mollic epipedon. They are in well defined drainageways and on flood plains. Felda soils have an argillic horizon at a depth of 20 to 40 inches. Pomona and Wabasso soils have a spodic horizon.

Typical pedon of Bradenton fine sand; 2,200 east and 100 feet south of the northwest corner of sec. 15, T. 25 S., R. 23 E.

A—0 to 4 inches; black (10YR 2/1) fine sand; weak fine granular structure; friable; many fine and medium roots; neutral; clear wavy boundary.

E—4 to 12 inches; dark grayish brown (10YR 4/2) fine sand; single grained; loose; many fine and medium roots; neutral; clear smooth boundary.

Bt1—12 to 16 inches; dark gray (10YR 4/1) sandy loam; weak medium subangular blocky structure; friable; common fine and medium roots; moderately alkaline; clear smooth boundary.

Bt2—16 to 22 inches; gray (10YR 5/1) sandy clay loam; weak medium subangular blocky structure; friable; common fine and medium roots; moderately alkaline; clear smooth boundary.

Ck1—22 to 60 inches; white (10YR 8/1) sandy loam; massive; many medium carbonate nodules; moderately alkaline; clear wavy boundary.

Ck2—60 to 80 inches; light gray (2.5Y 7/2) loamy sand; massive; sand grains coated with carbonates; moderately alkaline.

The solum is 20 to 50 inches thick. Reaction is strongly acid to neutral in the A and E horizons, slightly acid to moderately alkaline in the Bt horizon, and mildly alkaline or moderately alkaline in the C horizon.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1, or it is neutral in hue and has value of 2 to 4. It is 4 to 6 inches thick.

The E horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2. Some pedons have mottles in shades of gray, yellow, or brown. The E horizon is 4 to 14 inches thick. Texture is fine sand or loamy fine sand.

The Bt horizon has hue of 10YR, value of 4 to 7, and chroma of 1; hue of 10YR or 2.5Y, value of 3 to 7, and chroma of 2; or is neutral and has value of 4 to 7. Some pedons have mottles in shades of yellow, brown, or red. Texture is loamy fine sand, fine sandy loam, sandy loam, or sandy clay loam. Clay content is less than 18 percent in the upper 20 inches of this horizon.

The C horizon has hue of 10YR, 2.5Y, 5GY, or 5Y, value of 5 to 8, and chroma of 1 or 2, or it is neutral and has value of 5 to 8. Part or all of this horizon is calcareous. Texture ranges from fine sand to sandy clay loam.

Candler Series

The Candler series consists of excessively drained soils that formed in sandy marine or eolian deposits. These soils are on broad undulating upland ridges and knolls on flatwoods. Slopes range from 0 to 8 percent. These soils are hyperthermic, uncoated Typic Quartzipsamments.

Candler soils are associated on the landscape with Apopka, Millhopper, Sparr, and Tavares soils. Apopka, Millhopper, and Sparr soils have an argillic horizon. Apopka soils are well drained, Millhopper soils are moderately well drained, and Sparr soils are somewhat poorly drained. Tavares soils are in lower positions on the landscape and show evidence of wetness at a depth of 40 to 80 inches.

Typical pedon of Candler sand, 0 to 5 percent slopes; 2,200 feet north and 150 feet east of the southwest corner of sec. 7, T. 30 S., R. 28 E.

Ap—0 to 6 inches; dark brown (10YR 3/3) sand; weak fine granular structure; loose; many fine roots; many uncoated sand grains; medium acid; clear wavy boundary.

E1—6 to 42 inches; brownish yellow (10YR 6/6) sand; single grained; loose; few fine roots; many uncoated sand grains; medium acid; clear wavy boundary.

E2—42 to 63 inches; yellow (10YR 7/6) sand; single grained; loose; few fine roots; many uncoated sand grains; medium acid; clear wavy boundary.

E&Bt—63 to 80 inches; yellow (10YR 7/6) sand; single grained; loose; few fine roots; many uncoated sand grains; strong brown (7.5YR 5/8) loamy sand lamellae 1 to 3 millimeters thick and 1 to 8 millimeters long; well coated sand grains in lamellae; strongly acid.

The solum is at least 80 inches thick. Texture is sand or fine sand. One- to eight-millimeter-thick lamellae begin at a depth of 50 to 75 inches. The cumulative thickness is 1 to 3 inches within a depth of 80 inches. Texture is loamy sand or loamy fine sand. Reaction is very strongly acid to medium acid. Few to common small and large pockets of light gray and white clean sand grains are in the E and the E&Bt horizons in some pedons.

The A or Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 1 to 3. It is 2 to 8 inches thick. The E horizon has hue of 10YR, value of 5 to 7, and chroma of 4 to 8. The E part of the E&Bt horizon has hue of 10YR, value of 6 or 7, and chroma of 4 to 8. The Bt part has hue of 7.5YR, value of 5 or 6, and chroma of 6 to 8 or hue of 10YR, value of 7, and chroma of 8.

Chobee Series

The Chobee series consists of very poorly drained soils that formed in sandy and loamy marine sediments. These soils are in depressions and on flood plains. Slopes are 0 to 2 percent. These soils are fine-loamy, siliceous, hyperthermic Typic Argiaquolls.

Chobee soils are associated on the landscape with Bradenton, Eaton, Felda, Floridana, Kaliga, Nittaw, Paisley, and Wabasso soils. Bradenton, Eaton, Felda, Paisley, and Wabasso soils do not have a mollic epipedon. Floridana soils are sandy to a depth of 20 to 40 inches. Kaliga soils are organic. Nittaw soils are fine textured.

Typical pedon of Chobee fine sandy loam, frequently flooded; 100 feet southwest of South Bend Road on the Arbuckle Creek flood plain, 800 feet west and 1,700 feet south of the northeast corner of sec. 31, T. 32 S., R. 30 E.

A—0 to 12 inches; black (10YR 2/1) fine sandy loam; weak fine granular structure; friable; many fine and medium roots; neutral; clear smooth boundary.

Btg1—12 to 18 inches; gray (10YR 5/1) sandy clay loam; few fine prominent light olive brown (2.5Y 5/6) mottles; weak fine subangular blocky structure; friable; common fine and medium roots; moderately alkaline; gradual wavy boundary.

Btg2—18 to 32 inches; grayish brown (2.5Y 5/2) sandy clay loam; common medium white (10YR 8/1) carbonatic material; few fine distinct light olive brown (2.5Y 5/6) mottles; weak fine subangular blocky structure; friable; many fine and medium roots; moderately alkaline; gradual wavy boundary.

Btg3—32 to 55 inches; gray (10YR 6/1) sandy loam; few fine distinct yellowish brown (10YR 5/6) mottles;

friable; moderately alkaline; clear wavy boundary.
Cg—55 to 80 inches; light brownish gray (10YR 6/2) fine sand; single grained; nonsticky; moderately alkaline.

The solum is 40 to 60 inches thick. Reaction ranges from strongly acid to neutral in the A horizon and from medium acid to moderately alkaline and calcareous in the other horizons.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It is 4 to 18 inches thick.

The Btg1 horizon has hue of 10YR, value of 2 to 5, and chroma of 1 or 2; has hue of 2.5Y, value of 3 to 5, and chroma of 2; or is neutral and has value of 2 to 5. Some pedons have mottles.

The Btg2 and Btg3 horizons have hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2. Some pedons have mottles. Clay content ranges from 18 to 35 percent in the control section. Texture is dominantly sandy clay loam but includes sandy loam or fine sandy loam.

The Cg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2; has hue of 5Y, value of 4 to 6, and chroma of 1 or 2; or is neutral and has value of 4 to 6. Texture is fine sand, loamy sand, or sandy clay loam.

Duette Series

The Duette series consists of moderately well drained soils that formed in sandy marine sediments. These soils are on low ridges on flatwoods. Slopes are 0 to 2 percent. These soils are sandy, siliceous, hyperthermic Grossarenic Entic Haplohumods.

Duette soils are associated on the landscape with Immokalee, Myakka, Pomello, and St. Lucie soils. Immokalee and Myakka soils are poorly drained. Immokalee and Pomello soils have a Bh horizon at a depth of 30 to 50 inches, and Myakka soils have a Bh horizon within a depth of 30 inches. St. Lucie soils do not have a Bh horizon, and they are excessively drained.

Typical pedon of Duette fine sand; 1,700 feet east and 600 feet south of the northwest corner of sec. 3, T. 30 S., R. 26 E.

Ap—0 to 7 inches; gray (10YR 5/1) fine sand; single grained; loose; many fine roots; strongly acid; clear wavy boundary.
E1—7 to 10 inches; light brownish gray (10YR 6/2) fine sand; single grained; loose; common fine roots; medium acid; clear wavy boundary.
E2—10 to 59 inches; white (10YR 8/1) fine sand; common medium distinct light brownish gray (10YR 6/2) stains along root channels; single grained; loose; common fine and few medium roots; medium acid; clear smooth boundary.
Bh1—59 to 63 inches; mixed dark brown (7.5YR 3/2) and black (5YR 2/1) fine sand; weak fine subangular blocky structure; firm; weakly cemented or brittle in less than 50 percent of the horizon; very strongly acid; clear wavy boundary.
Bh2—63 to 72 inches; mixed dark brown (10YR 3/3) and black (5YR 2/1) fine sand; weak fine subangular blocky structure; firm; few fine roots; very strongly acid; clear smooth boundary.
Bh3—72 to 80 inches; black (5YR 2/1) and dark brown (7.5YR 3/2) fine sand; massive; firm; very strongly acid.

The solum is at least 60 inches thick. Reaction ranges from very strongly acid to medium acid.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It is 4 to 6 inches thick.

The E horizon has hue of 10YR, value of 5 to 8, and chroma of 1 or 2. It is 46 to 69 inches thick. Texture is sand or fine sand.

The Bh horizon has hue of 10YR, value of 2 or 3, and chroma of 1 to 3; hue of 7.5YR, value of 3, and chroma of 2; or hue of 5YR, value of 2, and chroma of 1 or 2. Texture is fine sand or sand.

Eaton Series

The Eaton series consists of very poorly drained soils that formed in sandy and clayey marine sediments. These soils are in depressional areas on flatwoods. Slopes are 0 to 2 percent. These soils are clayey, mixed, hyperthermic Arenic Albaqualfs.

Eaton soils are associated on the landscape with Felda, Floridana, Lynne, Pomona, and Wauchula soils. Felda soils have less clay in the argillic horizon than the Eaton soils. Floridana soils have a mollic epipedon. Lynne, Pomona, and Wauchula soils have a spodic horizon and are poorly drained.

Typical pedon of Eaton mucky fine sand, depressional; in a cypress swamp 200 feet south and 700 feet east of the northwest corner of sec. 34, T. 26 S., R. 24 E.

A—0 to 6 inches; black (10YR 2/1) mucky fine sand; weak fine granular structure; very friable; common fine roots; very strongly acid; clear smooth boundary.

Eg—6 to 29 inches; light gray (10YR 7/1) fine sand; single grained; loose; few fine roots; very strongly acid; abrupt smooth boundary.

Btg1—29 to 33 inches; gray (N 5/0) sandy clay loam; moderate coarse subangular blocky structure; firm; few fine roots; thin clay films on faces of peds; strongly acid; clear wavy boundary.

Btg2—33 to 80 inches; gray (N 5/0) sandy clay; moderate coarse blocky structure; very firm; few fine roots; thin clay films on faces of peds; strongly acid.

The solum is at least 70 inches thick. Reaction ranges from medium acid to very strongly acid except where lime has been added to the soil.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1, or it is neutral in hue and has value of 2. It is 4 to 8 inches thick.

The Eg horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. It is 14 to 25 inches thick. Texture is sand or fine sand.

The Btg horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2, or it is neutral in hue and has value of 5 to 7. Texture ranges from sandy clay loam to sandy clay. The content of clay in the upper 20 inches averages from 35 to 50 percent.

EauGallie Series

The EauGallie series consists of poorly drained soils that formed in sandy and loamy marine sediments. These soils are on flatwoods. Slopes are from 0 to 2 percent. These soils are sandy, siliceous, hyperthermic Alfic Haplaquods.

EauGallie soils are associated on the landscape with Felda, Floridana, Holopaw, Malabar, Pomona, and Wabasso soils. Felda soils do not have a spodic horizon and have an argillic horizon at a depth of 20 to 40 inches. Floridana soils are in depressions, are very poorly drained, do not have a spodic horizon, and have an argillic horizon at a depth of 20 to 40 inches. Holopaw soils do not have a spodic horizon. Malabar soils have a Bw horizon. Pomona soils have less than 35 percent base saturation in the argillic horizon. Wabasso soils have an argillic horizon at a depth of less than 40 inches.

Typical pedon of EauGallie fine sand; 1,250 feet north and 600 feet east of the southwest corner of sec. 4, T. 26 S., R. 23 E.

A—0 to 6 inches; fine sand, black (10YR 2/1) when rubbed; salt-and-pepper appearance when unrubbed; weak fine granular structure; very friable; common fine roots; very strongly acid; clear smooth boundary.

E1—6 to 12 inches; gray (10YR 5/1) fine sand; single grained; loose; few fine roots; medium acid; clear smooth boundary.

E2—12 to 26 inches; light gray (10YR 7/1) fine sand; single grained; loose; few fine roots; medium acid; abrupt smooth boundary.

Bh—26 to 32 inches; black (N 2/0) fine sand; weak fine subangular blocky structure; friable; strongly acid; clear wavy boundary.

BE—32 to 52 inches; dark brown (10YR 4/3) fine sand; few fine and medium distinct black (10YR 2/1) Bh bodies; single grained; loose; slightly acid; clear wavy boundary.

Btg—52 to 80 inches; gray (5Y 5/1) sandy clay loam; weak medium subangular blocky structure; friable; neutral.

The solum is 46 to 90 inches thick. Reaction is very strongly acid to medium acid in the A and E horizons, very strongly acid to slightly acid in the Bh horizon, and very strongly acid to mildly alkaline in the Btg horizon.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1. It is 3 to 10 inches thick.

The E horizon has hue of 10YR, value of 5 to 8, and chroma of 1 or 2 or is neutral and has value of 5. It is 12 to 24 inches thick. Texture is sand or fine sand.

The Bh horizon has hue of 5YR or 10YR, value of 2 or 3, and chroma of 1 to 3; has hue of 7.5YR, value of 3, and chroma of 2; or is neutral and has value of 2 or 3. It is 6 to 29 inches thick. Texture is sand, fine sand, or loamy fine sand.

The BE horizon has hue of 10YR, value of 5, and chroma of 2 or value of 4 to 7 and chroma of 3 or 4 or has hue of 7.5YR, value of 5, and chroma of 6. It is as much as 24 inches thick. Texture is sand or fine sand. Some pedons do not have a BE horizon.

The Btg horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 6, and chroma of 2 or less. Some pedons have few to common yellow, brown, or gray mottles. Texture is sandy loam, fine sandy loam, or sandy clay loam.

Some pedons have a C horizon, which has hue of 10YR or 5Y, value of 5 or 6, and chroma of 1 or 2. Texture is sand, fine sand, or sandy loam.

Electra Series

The Electra series consists of somewhat poorly drained soils that formed in sandy and loamy marine deposits. These soils are on low ridges on flatwoods. Slopes are 0 to 2 percent. These soils are sandy, siliceous, hyperthermic Arenic Ultic Haplohumods.

Electra soils are associated on the landscape with Adamsville, Myakka, Pomello, Pomona, Smyrna, and Sparr soils. Adamsville and Sparr soils do not have a spodic horizon. Myakka, Smyrna, and Pomona soils are poorly drained, and Pomello soils are moderately well drained. Pomello soils do not have an argillic horizon.

Typical pedon of Electra fine sand; about 1 mile southeast of Tiger Lake, 2,000 feet north and 800 feet east of the southwest corner of sec. 16, T. 30 S., R. 30 E.

Ap—0 to 6 inches; dark gray (10YR 4/1) fine sand; weak fine granular structure; very friable; many fine and medium roots; medium acid; abrupt smooth boundary.

E—6 to 42 inches; light gray (10YR 7/1) fine sand; single grained; loose; few fine and medium roots; strongly acid; abrupt wavy boundary.

Bh—42 to 50 inches; black (10YR 2/1) fine sand; sand grains coated with organic matter; few medium faint dark reddish brown (5YR 3/2) mottles; weak medium and coarse subangular blocky structure; friable; few fine roots; very strongly acid; clear wavy boundary.

E'—50 to 55 inches; brown (10YR 5/3) fine sand; single grained; loose; few fine roots; very strongly acid; clear wavy boundary.

Btg—55 to 80 inches; gray (10YR 5/1) sandy clay loam; few fine distinct yellowish red (5YR 4/6) mottles; moderate medium subangular blocky structure; firm; very strongly acid.

The solum is more than 60 inches thick. Reaction ranges from extremely acid to strongly acid.

The A horizon has hue of 10YR, value of 4 to 6, and chroma of 1. It is 2 to 8 inches thick.

The E horizon has hue of 10YR, value of 5 to 8, and chroma of 1 or 2. It is 28 to 46 inches thick. Texture is sand or fine sand.

The Bh horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 to 3, or it is neutral and has value of 2. It is 7 to 18 inches thick. Texture is sand or fine sand.

The E' horizon has hue of 10YR, value of 5 to 7, and chroma of 1 to 3. Texture is sand or fine sand.

The Btg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 to 4. Texture is fine sandy loam, sandy loam, or sandy clay loam.

Felda Series

The Felda series consists of very poorly drained and poorly drained, moderately rapidly permeable soils that formed in unconsolidated sandy and loamy marine sediments. These soils are in sloughs or low hammocks on flatwoods, in depressions, and on flood plains. Slopes are 0 to 2 percent. These soils are loamy, siliceous, hyperthermic Arenic Ochraqualfs.

Felda soils are associated on the landscape with Chobee, Eaton, Floridana, Holopaw, Kaliga, and Pompano soils. Chobee and Floridana soils have a mollic epipedon. Eaton soils have an abrupt textural change between the E horizon and the Bt horizon and contain more clay in the Bt horizon than the Felda soils. Holopaw soils have a Bt horizon at a depth of 40 to 80 inches. Kaliga soils are organic. Pompano soils do not have a Bt horizon.

Typical pedon of Felda fine sand; 1,600 feet east and 700 feet north of the southwest corner of sec. 28, T. 28 S., R. 23 E.

A—0 to 5 inches; very dark gray (10YR 3/1) fine sand; weak medium granular structure; very friable; many fine and medium roots; medium acid; clear smooth boundary.

Eg1—5 to 14 inches; light brownish gray (10YR 6/2) fine sand; many medium faint light yellowish brown (10YR 6/4) mottles; single grained; loose; many fine roots; slightly acid; clear wavy boundary.

Eg2—14 to 22 inches; light gray (10YR 7/2) fine sand; single grained; loose; few fine and medium roots; slightly acid; clear wavy boundary.

Btg—22 to 45 inches; gray (10YR 6/1) sandy clay loam; common medium prominent yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; few fine roots; thin patchy clay films on faces of peds; moderately alkaline; gradual wavy boundary.

BCg—45 to 50 inches; light gray (10YR 7/1) sandy loam; few coarse prominent dark yellowish brown (10YR 4/4) mottles; weak coarse subangular blocky structure; firm; moderately alkaline; gradual wavy boundary.

Cg1—50 to 70 inches; light gray (10YR 7/1) sandy loam; few coarse prominent yellow (10YR 7/6) mottles; few masses of sandy clay loam; massive; firm; gradual wavy boundary.

Cg2—70 to 80 inches; pale green (5G 7/2) sandy loam; massive; very firm; moderately alkaline.

The solum is 30 to 60 inches thick. Reaction is strongly acid to mildly alkaline in the A and E horizons and slightly acid to moderately alkaline in the B and C horizons.

The A horizon has hue of 10YR, value of 2 to 5, and chroma of 1, or value of 5 and chroma of 2. It is 3 to 7 inches thick.

The E horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2. It has mottles in shades of yellow or brown. It is 15 to 32 inches thick. Texture is sand or fine sand.

The Bt horizon has hue of 10YR or 5Y, value of 4 to 7, and chroma of 1 or 2. Some pedons have mottles in shades of yellow or brown. Texture is sandy loam, fine sandy loam, or sandy clay loam.

The C horizon has hue of 10YR to 5G, value of 4 to 8, and chroma of 1 or 2. Texture ranges from fine sand to sandy loam.

Floridana Series

The Floridana series consists of very poorly drained soils that formed in sandy and loamy marine deposits. These soils are in depressions, mostly on flatwoods. Slopes are 0 to 2 percent. These soils are loamy, siliceous, hyperthermic Arenic Argiaquolls.

Floridana soils are associated on the landscape with EauGallie, Felda, Holopaw, Kaliga, and Myakka soils. EauGallie, Felda, Holopaw, and Myakka soils do not have a mollic epipedon. EauGallie and Myakka soils have a spodic horizon. Kaliga soils are organic.

Typical pedon of Floridana mucky fine sand, depressional; 2,700 feet south and 1,300 feet east of the northwest corner of sec. 6, T. 26 S., R. 23 E.

A1—0 to 8 inches; black (N 2/0) mucky fine sand; weak fine granular structure; very friable; many fine and few coarse roots; sand grains coated with organic material; neutral; clear smooth boundary.

A2—8 to 15 inches; black (10YR 2/1) fine sand; weak fine granular structure; very friable; common fine and few coarse roots; strongly acid; clear wavy boundary.

Eg1—15 to 23 inches; gray (10YR 5/1) fine sand; single grained; loose; common fine and few coarse roots; very strongly acid; gradual wavy boundary.

Eg2—23 to 28 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; common fine and few coarse roots; very strongly acid; abrupt wavy boundary.

Btg1—28 to 40 inches; grayish brown (10YR 5/2) sandy clay loam; few fine faint brownish yellow mottles; weak medium subangular blocky structure; firm; few coarse roots; strongly acid; gradual wavy boundary.

Btg2—40 to 48 inches; light brownish gray (10YR 6/2) sandy clay loam; common medium and coarse distinct light yellowish brown (10YR 6/4) mottles; moderate fine subangular blocky structure; firm; medium acid; clear wavy boundary.

Btg3—48 to 58 inches; gray (5Y 5/1) sandy clay loam; common coarse prominent light yellowish brown (10YR 6/4) mottles; moderate medium subangular blocky structure; firm; medium acid; gradual smooth boundary.

BCg—58 to 80 inches; greenish gray (5GY 5/1 and 6/1 mixed) sandy loam; pockets of fine sand; moderate medium subangular blocky structure; firm; medium acid.

The solum is 58 to more than 80 inches thick. Reaction ranges from very strongly acid to moderately alkaline.

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. It is 12 to 19 inches thick. Texture is fine sand or mucky fine sand.

The Eg horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2 or hue of 2.5Y, value of 4, and chroma of 2. Texture is fine sand or sand.

The Btg and BCg horizons have hue of 10YR, value of 4, and chroma of 1; have hue of 10YR, value of 5 or 6, and chroma of 1 or 2; have hue of 5Y, value of 5, and chroma of 1 or 2; have hue of 5GY, value of 5 or 6, and chroma of 1; or are neutral and have value of 4. Gray, yellow, and brown mottles are in some pedons. Texture is sandy loam, fine sandy loam, or sandy clay loam.

Fort Meade Series

The Fort Meade series consists of well drained soils that formed in sandy marine sediments underlain by or mixed with phosphatic material. These soils are on broad, undulating, upland ridges. Slopes range from 0 to 5 percent. These soils are sandy, siliceous, hyperthermic Quartzipsammentic Haplumbrepts.

Fort Meade soils are associated on the landscape with Apopka, Candler, and Tavares soils. Apopka, Candler, and Tavares soils do not have a mollic or umbric epipedon. Apopka soils have an argillic horizon within a depth of 80 inches, and Candler soils have loamy sand lamellae within a depth of 80 inches. Tavares soils are in lower positions on the landscape than Fort Meade soils and show evidence of wetness at a depth of 40 to 80 inches.

Typical pedon of Fort Meade sand, 0 to 5 percent slopes; 600 feet east and 2,000 feet south of the northwest corner of sec. 4, T. 32 S., R. 23 E.

Ap—0 to 8 inches; very dark gray (10YR 3/1) sand; weak fine granular structure; friable; many fine and medium roots; strongly acid; clear smooth boundary.

A—8 to 25 inches; very dark gray (10YR 3/1) sand; weak fine granular structure; friable; few fine, medium, and coarse roots; very strongly acid; clear wavy boundary.

C1—25 to 35 inches; brown (10YR 4/3) sand; weak fine granular structure; friable; few medium and fine roots; very strongly acid; clear wavy boundary.

C2—35 to 58 inches; yellowish brown (10YR 5/6) sand; weak fine granular structure; friable; few medium and fine roots; 1 percent phosphatic rock fragments increasing with depth; very strongly acid; gradual wavy boundary.

C3—58 to 80 inches; yellowish brown (10YR 5/4) sand; few coarse distinct pale brown (10YR 6/3) mottles; weak fine granular structure; friable; few medium and fine roots; 1 to 3 percent rock fragments; very strongly acid.

Sand, fine sand, loamy sand, and loamy fine sand extend to a depth of at least 80 inches. Reaction ranges from strongly acid to neutral in the A horizon and from very strongly acid to medium acid in the C horizon. Pebbles of phosphate rock or concretionary material enriched with phosphate are in some horizons. Content of weathered phosphatic and iron pebbles ranges from 0 to 5 percent. The pebbles are 4 to 20 millimeters in diameter.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 to 3 or hue of 7.5YR, value of 3, and chroma of 2. It is dominantly 16 to 30 inches thick, but ranges from 11 to 30 inches in thickness.

The C horizon has hue of 10YR to 5YR, value of 6, and chroma of 3 to 8 or hue of 10YR, value of 3, and chroma of 4.

Holopaw Series

The Holopaw series consists of very poorly drained soils that formed in sandy and loamy marine sediments. These soils are in depressions on flatwoods. Slopes are 0 to 2 percent. These soils are loamy, siliceous, hyperthermic Grossarenic Ochraqualfs.

Holopaw soils are associated on the landscape with EauGallie, Felda, Floridana, Malabar, and Pomona soils. EauGallie, Felda, Malabar, and Pomona soils are poorly drained. EauGallie and Pomona soils have a spodic horizon within 30 inches of the surface. Felda soils have an argillic horizon at a depth of 20 and 40 inches. Malabar soils have a Bw horizon. Floridana soils have a mollic epipedon and have an argillic horizon at a depth of 20 to 40 inches.

Typical pedon of Holopaw fine sand, depressional; 2,500 feet south and 1,200 feet east of the northwest corner of sec. 30, T. 28 S., R. 23 E.

A—0 to 6 inches; very dark gray (10YR 3/1) fine sand; single grained; loose; many fine roots; slightly acid; clear smooth boundary.

Eg1—6 to 9 inches; light brownish gray (10YR 6/2) fine sand; single grained; loose; many fine roots; slightly acid; clear smooth boundary.

Eg2—9 to 21 inches; dark grayish brown (10YR 4/2) fine sand; common medium faint dark yellowish brown (10YR 4/4) mottles; single grained; loose; common fine roots; slightly acid; clear smooth boundary.

Eg3—21 to 38 inches; light gray (10YR 7/2) fine sand; single grained; loose; few fine roots; slightly acid; clear smooth boundary.

Eg4—38 to 41 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; neutral; clear smooth boundary.

Btg—41 to 65 inches; light gray (5Y 7/1) sandy clay loam; few fine faint yellowish brown mottles; weak medium subangular blocky structure; firm; neutral; gradual wavy boundary.

Cg—65 to 80 inches; gray (5Y 5/1) loamy sand; massive; friable; neutral.

The solum is more than 50 inches thick. Reaction ranges from strongly acid to neutral in the surface layer and from strongly acid to moderately alkaline in the other layers.

The A horizon has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 2 or less. It is 2 to 13 inches thick. Where value is 3 or less, this horizon is less than 7 inches thick.

To a depth of 30 inches, the Eg horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 3 or less and has mottles that have chroma of 2 or less, or it has chroma of 2 or less with mottles of yellow or brown. The chroma is 2 or less below a depth of 30 inches. Texture is sand or fine sand.

The Btg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 2 or less. It has mottles in shades of brown or yellow. Texture is sandy loam, fine sandy loam, or sandy clay loam.

The C horizon has hue of 10YR to 5GY, value of 5 to 7, and chroma of 2 or less. Texture is sand, fine sand, loamy fine sand, or loamy sand.

Hontoon Series

The Hontoon series consists of very poorly drained soils that formed in hydrophytic nonwoody plant remains. These soils are in swamps and marshes. Slopes are dominantly less than 1 percent but range up to 2 percent. These soils are dysic, hyperthermic Typic Medisaprists.

Hontoon soils are associated on the landscape with Basinger, Kaliga, Myakka, Placid, St. Johns, and Samsula soils. All these soils are mineral in origin except the Kaliga and Samsula soils, which have mineral material within a depth of 51 inches.

Typical pedon of Hontoon muck; 1,600 feet east and 1,500 feet south of the northwest corner of sec. 16, T. 28 S., R. 25 E.

Oa1—0 to 11 inches; well decomposed black (N 2/0) muck; about 10 percent fiber; weak fine granular structure; friable; many fine roots; sodium pyrophosphate extract very dark grayish brown (10YR 3/2); extremely acid; clear wavy boundary.

Oa2—11 to 75 inches; well decomposed organic material (sapric), dark brown (7.5YR 3/2) when unrubbed; dark reddish brown (5YR 2.5/2) when rubbed; weak fine granular structure; friable; few fine roots; sodium pyrophosphate extract dark yellowish brown (10YR 3/4); extremely acid; abrupt wavy boundary.

C—75 to 80 inches; black (N 2/0) sandy loam; massive; friable; very strongly acid.

The organic matter is more than 51 inches thick. Measured on 0.01 molar calcium chloride solution, reaction is extremely acid in the control section and ranges to strongly acid in other parts of the profile.

The Oa horizon has hue of 10YR to 5YR, value of 2 or 3, and chroma of 1 or 2, or it is neutral and has value of 2. Fiber content is less than 16 percent after rubbing.

The C horizon has hue of 10YR, value of 2 to 5, and chroma of 1 or 2; hue of 5Y, value of 3 to 5, and chroma of 1; or hue of 5GY, value of 4 or 5, and chroma of 1. Texture ranges from sand to sandy clay loam. Some pedons do not have a C horizon.

Immokalee Series

The Immokalee series consists of poorly drained soils that formed in sandy marine sediments. These soils are in broad areas on flatwoods. Slopes are 0 to 2 percent. These soils are sandy, siliceous, hyperthermic Arenic Haplaquods.

Immokalee soils are associated on the landscape with Adamsville, Basinger, Duette, Myakka, Pomello, Pomona, Satellite, and Smyrna soils. Adamsville, Basinger, and Satellite soils do not have a spodic horizon. Basinger soils are in slightly lower positions on the landscape than the Immokalee soils and are wetter. Adamsville and Satellite soils are in higher positions and are better drained. Duette and Pomello soils are on slightly higher ridges and are better drained. Duette soils have a spodic horizon at a depth of more than 50 inches, and Pomello soils have a spodic horizon at a depth of 30 to 50 inches. Myakka, Pomona, and Smyrna soils are in landscape positions similar to those of the Immokalee soils and have a spodic horizon at a depth of less than 30 inches. In addition, Pomona soils have an argillic horizon below the spodic horizon.

Typical pedon of Immokalee sand; 850 feet south and 2,200 feet east of the northwest corner of sec. 30, T. 29 S., R. 26 E.

Ap—0 to 7 inches; sand, very dark gray (10YR 3/1) when rubbed; salt-and-pepper appearance when unrubbed; weak fine granular structure; friable; many fine roots; very strongly acid; clear wavy boundary.

E1—7 to 18 inches; light gray (10YR 7/1) sand; single grained; loose; few fine and medium roots; medium acid; clear wavy boundary.

E2—18 to 39 inches; white (10YR 8/1) sand; single grained; loose; few fine and medium roots; medium acid; abrupt wavy boundary.

Bh1—39 to 44 inches; black (5YR 2/1) sand; moderate medium subangular blocky structure; friable; common fine roots; very strongly acid; clear wavy boundary.

Bh2—44 to 58 inches; black (N 2/0) sand; moderate medium subangular blocky structure; friable; few fine roots; extremely acid; clear wavy boundary.

E'—58 to 66 inches; gray (10YR 5/1) sand; single grained; loose; few fine roots; strongly acid; abrupt wavy boundary.

B'h1—66 to 75 inches; very dark gray (10YR 3/1) sand; moderate medium subangular blocky structure; firm; very strongly acid; abrupt wavy boundary.

B'h2—75 to 80 inches; black (N 2/0) sand; moderate medium subangular blocky structure; very firm, weakly cemented in 40 percent of horizon; extremely acid.

The solum is 72 to 80 inches thick. Texture is sand or fine sand. Reaction is extremely acid to medium acid.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1. It is 4 to 10 inches thick. Where value is 3 or less, this horizon is less than 10 inches thick.

The E horizon has hue of 10YR, value of 5 to 8, and chroma of 1, or value of 5 to 7 and chroma of 2. It is 15 to 41 inches thick.

The Bh horizon has hue of 5YR, value of 2, and chroma of 1 or 2, or value of 3 and chroma of 2 or 3; has hue of 7.5YR, value of 3, and chroma of 2; has hue of 10YR, value of 2 or 3, and chroma of 1 or 2; or is neutral and has value of 2. It is 10 to 45 inches thick.

The E' horizon has the same range in color as that of the E horizon, and the B'h horizon has the same range in color as that of the Bh horizon. Some pedons do not have the E' and B'h horizons, but have a BC horizon, which has hue of 10YR, value of 3 or 4, and chroma of 3.

Some pedons have a C horizon, which has hue of 10YR, value of 6, and chroma of 1 or 2.

Kaliga Series

The Kaliga series consists of very poorly drained soils that formed in hydrophytic nonwoody plant remains. These soils are in swamps and marshes. Slopes are less than 2 percent. These soils are loamy, siliceous, dysic, hyperthermic Terric Medisaprists.

Kaliga soils are associated on the landscape with Basinger, Floridana, Hontoon, Myakka, and Samsula soils. Basinger, Floridana, and Myakka soils are of mineral origin. Hontoon soils have organic layers to a depth of more than 51 inches. Samsula soils are sandy in the underlying mineral layers.

Typical pedon of Kaliga muck; in an improved pasture, 1,000 feet east and 2,000 feet north of the southwest corner of sec. 2, T. 30 S., R. 26 E.

Oap—0 to 9 inches; muck, black (N 2/0) rubbed and pressed; about 10 percent unrubbed fiber, about 5 percent rubbed; moderate medium granular structure; friable; many fine and few medium roots; sodium pyrophosphate extract dark reddish brown (5YR 3/2); extremely acid; clear smooth boundary.

Oa—9 to 30 inches; muck, dark reddish brown (5YR 2/2) rubbed and pressed; about 30 percent unrubbed fiber, 10 percent rubbed; moderate thin platy structure parting to moderate fine granular; friable; few fine roots; sodium pyrophosphate extract dark brown (7.5YR 4/4); extremely acid; abrupt smooth boundary.

Cg1—30 to 55 inches; very dark gray (5Y 3/1) loam; common medium and coarse faint black (10YR 2/1) convolutions; massive; slightly sticky and slightly plastic; very strongly acid; clear wavy boundary.

Cg2—55 to 75 inches; dark gray (5Y 4/1) sandy loam; few fine prominent brownish yellow (10YR 6/6) and reddish yellow (7.5YR 6/8) mottles; massive; sticky and plastic; slightly acid; clear wavy boundary.

Cg3—75 to 80 inches; light gray (5Y 7/1) sand; nonsticky and nonplastic; strongly acid.

Reaction of the organic material is extremely acid except where lime has been added to the soil. Reaction of the mineral layer is very strongly acid to slightly acid.

The Oap and Oa horizons have hue of 5YR, value of 2, and chroma of 1; have hue of 10YR, value of 2, and chroma of 1; or are neutral and have value of 2. The combined thickness of these horizons is 19 to 38 inches.

The Cg horizon has hue of 10YR to 5Y, value of 2 to 7, and chroma of 1 or 2, or it is neutral and has value of 2 to 5. Texture ranges from sand to sandy clay loam. Average weighted clay content is 10 to 35 percent in the upper 12 inches of the Cg horizon or to a depth of 51 inches, whichever is thickest.

Kendrick Series

The Kendrick series consists of well drained soils that formed in sandy and loamy marine sediments. These soils are on broad uplands and high knolls on flatwoods. Slopes range from 0 to 5 percent. These soils are loamy, siliceous, hyperthermic Arenic Paleudults.

Kendrick soils are associated on the landscape with Apopka, Candler, Millhopper, and Fort Meade soils. Apopka and Millhopper soils have loamy material at a depth of 40 to 80 inches. Millhopper soils are moderately well drained. Candler soils have lamellae at a depth of 60 to 80 inches. Fort Meade soils are sandy throughout.

Typical pedon of Kendrick fine sand, 0 to 5 percent slopes; 500 feet east and 300 feet south of the northwest corner of sec. 16, T. 28 S., R. 23 E.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) fine sand; weak fine granular structure; very friable; few fine and medium roots; very strongly acid; clear smooth boundary.

E—9 to 29 inches; brownish yellow (10YR 6/6) fine sand; single grained; loose; few fine and medium roots; very strongly acid; clear wavy boundary.

BE—29 to 34 inches; brownish yellow (10YR 6/8) fine sandy loam; weak medium subangular blocky structure; friable; few fine and medium roots; very strongly acid; clear wavy boundary.

Bt1—34 to 39 inches; yellowish brown (10YR 5/8) sandy clay loam; discontinuous brown (7.5YR 4/4) clay films; moderate medium subangular blocky structure; firm; few fine roots; 1 percent plinthite; strongly acid; gradual wavy boundary.

Bt2—39 to 49 inches; yellowish brown (10YR 5/6) sandy clay loam; many coarse distinct red (2.5YR 4/6) mottles; discontinuous brown (7.5YR 4/4) clay films; moderate medium subangular blocky structure; firm; 4 percent plinthite; strongly acid; gradual wavy boundary.

Bt3—49 to 64 inches; brownish yellow (10YR 6/8) sandy clay loam; many coarse prominent dark red (2.5YR 3/6) mottles; strong coarse subangular blocky structure; very firm; 5 percent plinthite; strongly acid; gradual wavy boundary.

C—64 to 80 inches; gray (10YR 6/1) sandy clay loam; few medium distinct dark red (2.5YR 3/6) mottles; massive; very strongly acid.

The solum is more than 60 inches thick. Reaction ranges from very strongly acid to medium acid except where lime has been added to the soil.

The solum is at least 60 inches thick. Reaction is very strongly acid to medium acid in all horizons.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. It is 5 to 9 inches thick.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 3 to 8. It is 15 to 32 inches thick.

The BE horizon has the same range in color as that of the Bt horizon. Texture is sandy loam or fine sandy loam. Some pedons do not have a BE horizon.

The Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 4 to 8 or hue of 7.5YR, value of 7, and chroma of 8. It is 16 to 54 inches thick. Texture is sandy loam, fine sandy loam, or sandy clay loam. In some pedons, the lower part of this horizon is sandy clay.

The C horizon has hue of 10YR, value of 5 or 6, and chroma of 1.

Lochloosa Series

The Lochloosa series consists of somewhat poorly drained soils that formed in sandy and loamy marine sediments. These soils are in low areas on uplands and low knolls on flatwoods. Slopes are 0 to 2 percent. These soils are loamy, siliceous, hyperthermic Aquic Arenic Paleudults.

Lochloosa soils are associated on the landscape with Kendrick, Millhopper, Pomona, Sparr, and Wauchula soils. Kendrick soils are well drained and are in higher positions on the landscape than the Lochloosa soils. Millhopper and Sparr soils are sandy at a depth of 40 to 60 inches. Pomona and Wauchula soils are poorly drained and have a Bh horizon.

Typical pedon of Lochloosa fine sand; 1,650 feet east and 1,850 south of the northwest corner of sec. 10, T. 29 S., R. 23 E.

Ap—0 to 6 inches; dark gray (10YR 4/1) fine sand; weak fine granular structure; friable; common fine roots; strongly acid; abrupt smooth boundary.

E—6 to 36 inches; very pale brown (10YR 7/3) fine sand; few fine faint pale brown mottles; single grained; loose; few fine roots; strongly acid; clear wavy boundary.

Bt—36 to 40 inches; pale brown (10YR 6/3) sandy clay loam; few fine faint light gray mottles; moderate medium subangular blocky structure; firm; few fine roots; strongly acid; clear wavy boundary.

Btg1—40 to 46 inches; light brownish gray (10YR 6/2) sandy clay loam; common medium distinct yellowish brown (10YR 5/4) mottles; strong medium subangular blocky structure; firm; few fine roots; thin patches of clay films on faces of peds; clay flows along root channels; very strongly acid; clear wavy boundary.

Btg2—46 to 65 inches; gray (10YR 6/1) sandy clay loam; common medium prominent strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; firm; 2 percent plinthite; very strongly acid; gradual wavy boundary.

BC—65 to 80 inches; gray (10YR 5/1) sandy clay loam; common medium prominent yellowish red (5YR 4/6) mottles; massive; firm; few lenses of sandy loam; very strongly acid.

The solum is 60 to at least 80 inches thick. Reaction is strongly acid or very strongly acid.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1, or value of 5 and chroma of 2. It is 5 to 8 inches thick.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 3 or 4. Mottles are in shades of yellow and brown. This horizon is 15 to 32 inches thick. Texture is fine sand or loamy sand.

The Bt horizon has hue of 10YR, value of 5 to 7, and chroma of 3 to 6. Few to many mottles in shades of gray, yellow, brown, and red are in the upper part of the horizon. The Btg horizon has value of 5 to 7 and chroma of 1 or 2 with few to many mottles. Plinthite makes up as much as 5 percent of the Bt and Btg horizons in some pedons. Texture is sandy loam or sandy clay loam.

The BC horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. It has few to many mottles in shades of gray, yellow, brown, and red. Texture ranges from sandy loam to sandy clay. A few fine lenses of sandy loam or loamy sand are in some pedons.

Some pedons have a C horizon, which has hue of 10YR, value of 4 to 7, and chroma of 1 or 2 or is neutral and has value of 4 or 5. The C horizon has few to many mottles in shades of gray, yellow, brown, and red. Texture is sandy loam or sandy clay loam with common medium lenses of sandy loam or loamy sand.

Lynne Series

The Lynne series consists of poorly drained soils that formed in sandy and clayey marine sediments. These soils are in broad areas on flatwoods. Slopes are 0 to 2 percent. These soils are sandy over clayey, siliceous, hyperthermic Ultic Haplaquods.

Lynne soils are associated on the landscape with Immokalee, Myakka, Pomona, and Wauchula soils. Immokalee and Myakka soils do not have an argillic horizon. Pomona soils have a spodic horizon and loamy material at a depth of more than 40 inches. Wauchula soils have a spodic horizon and loamy material within a depth of 40 inches.

Typical pedon of Lynne sand; in an improved pasture, 1,000 feet west and 500 feet south of the northeast corner of sec. 34, T. 26 S., R. 24 E.

Ap—0 to 5 inches; black (10YR 2/1) sand; weak fine granular structure; very friable; many fine and medium roots; slightly acid; abrupt smooth boundary.

E1—5 to 11 inches; gray (10YR 5/1) fine sand; single grained; loose; many fine and medium roots; very strongly acid; clear smooth boundary.

E2—11 to 21 inches; light gray (10YR 7/1) fine sand; single grained; many fine and medium roots; strongly acid; abrupt wavy boundary.

Bh—21 to 28 inches; black (10YR 2/1) fine sand; weak coarse subangular blocky structure parting to moderate medium granular; firm; few fine and medium roots; strongly acid; clear wavy boundary.

BE—28 to 33 inches; light yellowish brown (10YR 6/4) fine sand; single grained; loose; few fine and medium roots; few yellowish brown (10YR 5/8) coatings on some sand grains; 1-inch layer of iron stones, 0.25 to 0.75 inch in diameter, in the lower part of the horizon; strongly acid; clear wavy boundary.

Btg1—33 to 52 inches; light gray (10YR 7/1) sandy clay; many medium prominent yellowish brown (10YR 5/8) mottles; weak fine subangular blocky structure; sticky; few fine and medium roots; few light reddish brown (5YR 6/4) coatings on some faces of peds; very strongly acid; clear wavy boundary.

Btg2—52 to 62 inches; light gray (10YR 7/1) sandy clay; many medium prominent yellowish brown (10YR 5/8) mottles; strong coarse subangular blocky structure; very firm; few fine and medium roots; strongly acid; clear wavy boundary.

Btg3—62 to 80 inches; light gray (5Y 7/1) sandy clay; strong coarse subangular blocky structure; very firm; few fine roots; few yellowish brown (10YR 5/8) coatings on faces of peds; strongly acid.

The solum is at least 50 inches thick. Reaction ranges from extremely acid to strongly acid except where lime has been added to the soil.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. It is 5 to 7 inches thick. Texture is fine sand or sand.

The E horizon has hue of 10YR, value of 4 to 8, and chroma of 1 or 2. It is 9 to 16 inches thick. Texture is fine sand or sand.

The Bh horizon has hue of 5YR, value of 2 or 3, and chroma of 1 to 3; has hue of 7.5YR, value of 3, and chroma of 2; has hue of 10YR, value of 2, and chroma of 1 or 2; or is neutral and has value of 2. It is 7 to 15 inches thick. Texture is fine sand or loamy sand.

The BE horizon has hue of 10YR, value 5 to 7, and chroma of 3 or 4. It is 4 to 36 inches thick. Texture is fine sand or sand. In some pedons, this layer is an E′ horizon that has lower chroma.

The Btg horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2, or it is neutral in hue and has value of 6. Texture is sandy clay loam or sandy clay. The average clay content in the upper 20 inches of this horizon is 35 to 50 percent.

Malabar Series

The Malabar series consists of poorly drained soils that formed in sandy and loamy marine sediments. These soils are in low, narrow sloughs on flatwoods. Slopes are 0 to 2 percent. These soils are loamy, siliceous, hyperthermic Grossarenic Ochraqualfs.

Malabar soils are associated on the landscape with

EauGallie, Felda, Floridana, and Holopaw soils, which do not have a Bw horizon. In addition, EauGallie soils have a spodic horizon, Felda soils have an argillic horizon within 40 inches of the surface, and Floridana soils have a mollic epipedon and are very poorly drained.

Typical pedon of Malabar fine sand; 250 feet west and 1,900 feet north of the southeast corner of sec. 4, T. 26 S., R. 23 E.

A—0 to 5 inches; black (10YR 2/1) fine sand; weak fine granular structure; very friable; common fine and very fine roots; slightly acid; clear smooth boundary.

E1—5 to 14 inches; grayish brown (10YR 5/2) fine sand; few fine distinct yellowish brown (10YR 5/6) mottles; single grained; loose; few fine roots; neutral; gradual smooth boundary.

E2—14 to 22 inches; light brownish gray (10YR 6/2) fine sand; few fine faint brownish yellow mottles; single grained; loose; few fine roots; neutral; clear wavy boundary.

Bw1—22 to 30 inches; brownish yellow (10YR 6/8) fine sand; few fine faint yellowish brown mottles; single grained; loose; moderately alkaline; gradual wavy boundary.

Bw2—30 to 38 inches; yellow (10YR 7/6) fine sand; single grained; loose; moderately alkaline; gradual wavy boundary.

E′—38 to 48 inches; light brownish gray (10YR 6/2) fine sand; single grained; loose; moderately alkaline; abrupt smooth boundary.

Btg1—48 to 60 inches; gray (5Y 6/1) sandy loam; weak medium subangular blocky structure; very friable; moderately alkaline; gradual wavy boundary.

Btg2—60 to 80 inches; gray (5Y 6/1) sandy clay loam; few fine distinct white (10YR 8/1) soft lime nodules; weak medium subangular blocky structure; friable; moderately alkaline.

The solum is more than 45 inches thick. Reaction ranges from strongly acid to moderately alkaline.

The A horizon has hue of 10YR, value of 2, and chroma of 1, or value of 3 or 4 and chroma of 2; or it has hue of 2.5Y, value of 3 or 4, and chroma of 2. It is 4 to 8 inches thick.

The E horizon has hue of 10YR, value of 5, and chroma of 2; hue of 10YR, value of 6, and chroma of 2 or 3; hue of 10YR, value of 7 or 8, and chroma of 3 or 4; or hue of 2.5Y, value of 5 or 6, and chroma of 2. It is 8 to 18 inches thick. Texture is sand or fine sand.

The Bw horizon has hue of 10YR, value of 5 to 7, and chroma of 4 to 8 or hue of 7.5YR, value of 5, and chroma of 6 to 8. Texture is sand or fine sand. It is 14 to 26 inches thick.

The E′ horizon has hue of 10YR or 5Y, value of 5 to 7, and chroma of 1 or 2; has hue of 2.5YR, value of 6 or 7, and chroma of 2; or is neutral and has value of 5 to 7. It is 10 to 12 inches thick. Texture is sand or fine sand.

The Btg horizon has hue of 10YR or 5Y, value of 5 to 7, and chroma of 1 or 2. Texture is sandy loam, fine sandy loam, or sandy clay loam.

Some pedons have a Cg horizon, which has hue of 10YR, value of 5 to 7, and chroma of 1 or 2; has hue of 2.5Y, value of 5 to 7, and chroma of 2; has hue of 5Y, value of 5, and chroma of 1; or is neutral and has value of 5 to 7.

Millhopper Series

The Millhopper series consists of moderately well drained soils that formed in sandy and loamy marine sediments. These soils are on upland sand knolls on flatwoods. Slopes range from 0 to 5 percent. These soils are loamy, siliceous, hyperthermic Grossarenic Paleudults.

Millhopper soils are associated on the landscape with Apopka, Candler, Fort Meade, Sparr, and Tavares soils. Apopka and Fort Meade soils are well drained. In addition, Fort Meade soils have an umbric epipedon. Candler soils are excessively drained. Sparr soils are somewhat poorly drained. Tavares soils are sandy throughout. In most areas the better drained soils are in the higher positions on the landscape.

Typical pedon of Millhopper fine sand, 0 to 5 percent slopes; 0.5 mile north and 400 feet east of the southwest corner of sec. 23, T. 29 S., R. 23 E.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) fine sand; single grained; loose; many fine roots; very strongly acid; clear wavy boundary.

E1—6 to 19 inches; light yellowish brown (10YR 6/4) fine sand; brown (10YR 5/3) stains around root channels; many charcoal chips; single grained; loose; few fine roots; strongly acid; clear smooth boundary.

E2—19 to 38 inches; very pale brown (10YR 7/4) fine sand; brownish yellow (10YR 6/6) iron segregation; single grained; loose; few fine roots; strongly acid; clear wavy boundary.

E3—38 to 63 inches; very pale brown (10YR 7/3) fine sand; many medium distinct light gray (10YR 7/2) and few fine distinct yellowish brown (10YR 5/8) and strong brown (7.5YR 5/8) mottles; single grained; loose; few fine roots; strongly acid; clear wavy boundary.

Bt—63 to 68 inches; light yellowish brown (10YR 6/4) fine sandy loam; many medium distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; few fine roots; very strongly acid; clear smooth boundary.

Btg—68 to 80 inches; gray (5YR 6/1) fine sandy loam; many coarse prominent strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm; few fine roots; very strongly acid.

The solum is more than 80 inches thick. Reaction ranges from very strongly acid to slightly acid in the A and E horizons and from very strongly acid to medium acid in the Bt and Btg horizons.

The A horizon has hue of 10YR, value of 4, and chroma of 1 or 2.

The E horizon has hue of 10YR, value of 5 to 8, and chroma of 3 or 4. It has mottles in shades of gray, yellow, and brown. Some pedons have an E3 horizon, which can have value of 8 and chroma of 1.

The Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. It has mottles in shades of yellow and brown. Texture is fine sandy loam or sandy loam. The Btg horizon has hue of 5YR to 2.5Y, value of 5 to 7, and chroma of 1 or 2. It has common mottles in shades of yellow, red, and brown.

Myakka Series

The Myakka series consists of poorly drained and very poorly drained soils that formed in sandy marine sediments. These soils are in broad, flat areas and depressional areas on flatwoods. Slopes range from 0 to 2 percent. These soils are sandy, siliceous, hyperthermic Aeric Haplaquods.

Myakka soils are associated on the landscape with Basinger, Immokalee, Ona, Placid, Pomona, and Smyrna soils. Basinger and Placid soils do not have a spodic horizon. Placid soils have an umbric epipedon. Immokalee soils have a spodic horizon at a depth of more than 30 inches. Ona soils have a spodic horizon directly below the surface horizon. Pomona soils have an argillic horizon within a depth of 80 inches. Smyrna soils have a spodic horizon at a depth of 18 to 20 inches.

Typical pedon of Myakka fine sand, in an area of Smyrna and Myakka fine sands; 1,000 feet east and 500 feet south of the northwest corner of sec. 36, T. 26 S., R. 23 E.

Ap—0 to 7 inches; fine sand, very dark gray (10YR 3/1) when rubbed; salt-and-pepper appearance when unrubbed; weak medium granular structure; very friable; many fine and medium roots; very strongly acid; clear smooth boundary.

E—7 to 25 inches; gray (10YR 6/1) fine sand; single grained; loose; common fine roots; very strongly acid; abrupt wavy boundary.

Bh1—25 to 30 inches; black (5YR 2/1) fine sand; moderate medium subangular blocky structure; friable; few fine faint dark yellowish brown stains along root channels; few fine roots; extremely acid; clear wavy boundary.

Bh2—30 to 36 inches; dark brown (7.5YR 3/2) fine sand; common medium distinct black (10YR 2/1) masses; weak medium subangular blocky structure; very friable; very strongly acid; gradual wavy boundary.

C—36 to 80 inches; yellowish brown (10YR 5/4) fine sand; single grained; loose; very strongly acid.

The solum is more than 40 inches thick. Texture is sand or fine sand. Reaction is extremely acid to slightly acid.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1, or it is neutral in hue and has value of 2 to 4. It is 3 to 8 inches thick.

The E horizon has hue of 10YR, value of 5 to 8, and chroma of 2 or less. It is 12 to 25 inches thick.

The Bh horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 to 3; has hue of 5YR, value of 3, and chroma of 4; or is neutral and has value of 2. It is 8 to 52 inches thick.

Some pedons have E′ and Bh′ horizons below the Bh horizon. Colors are similar to those of the E and Bh horizons.

The C horizon has hue of 10YR, value of 4 to 7, and chroma of 1 to 4. Some pedons have yellow, brown, or gray mottles.

Narcoossee Series

The Narcoossee series consists of somewhat poorly drained soils that formed in sandy marine sediments. These soils are on low ridges on flatwoods and low hammocks. Slopes are 0 to 2 percent. These soils are sandy, siliceous, hyperthermic Entic Haplohumods.

Narcoossee soils are associated on the landscape with Adamsville, Myakka, Pomello, Smyrna, and Tavares soils. Adamsville soils do not have a spodic horizon. Myakka and Smyrna soils are poorly drained and have a more strongly developed spodic horizon.

Pomello soils have a spodic horizon at a depth of more than 30 inches. Tavares soils do not have a spodic horizon and are better drained.

Typical pedon of Narcoossee sand; in a wooded area, 2,000 feet south and 800 feet west of the northeast corner of sec. 17, T. 30 S., R. 30 E.

A—0 to 5 inches; very dark gray (10YR 3/1) sand; weak fine granular structure; very friable; many fine and medium roots; extremely acid; clear wavy boundary.

E—5 to 17 inches; light gray (10YR 7/2) fine sand; single grained; loose; many medium and few coarse roots; extremely acid; clear wavy boundary.

Bh1—17 to 19 inches; black (10YR 2/1) sand; weak medium granular structure; firm; few fine roots; extremely acid; clear wavy boundary.

Bh2—19 to 22 inches; dark reddish brown (5YR 3/3) sand; moderate medium and coarse subangular blocky structure; friable; few fine roots; very strongly acid; clear smooth boundary.

BC—22 to 30 inches; dark yellowish brown (10YR 4/4) fine sand; single grained; loose; few fine roots; very strongly acid; clear smooth boundary.

C1—30 to 48 inches; pale brown (10YR 6/3) fine sand; single grained; loose; few fine roots; very strongly acid; clear smooth boundary.

C2—48 to 80 inches; pinkish gray (5YR 6/2) loamy sand; few black (5YR 2/1) Bh bodies; few ironstone concretions, 1 to 5 centimeters in diameter; single grained; nonsticky; very strongly acid.

The solum is 20 to 50 inches thick. Reaction is extremely acid to medium acid.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It is 4 to 7 inches thick.

The E horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2. It is 7 to 19 inches thick. Texture is sand or fine sand.

The Bh1 horizon has hue of 10YR, value of 2, and chroma of 1; hue of 7.5YR, value of 3, and chroma of 2; or hue of 5YR, value of 2 or 3, and chroma of 1 to 3. The Bh2 horizon has hue of 7.5YR, value of 3 or 4, and chroma of 2 to 4 or hue of 5YR, value of 3, and chroma of 3 or 4. These horizons combined are 3 to 5 inches thick. They are discontinuous in some pedons. Texture is sand or fine sand.

The BC horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4 or hue of 7.5YR, value of 4, and chroma of 4. Some pedons have mottles in shades of gray, brown, and yellow. This horizon is 6 to 16 inches thick. Texture is sand or fine sand.

The C horizon has hue of 10YR, value of 4 to 8, and chroma of 1 to 4. Some pedons have mottles in shades of gray, brown, and yellow. In some pedons, the lower part of the C horizon has hue of 5YR or 7.5YR, value of 4 to 6, and chroma of 2. Few to common black or brown Bh bodies are in some pedons. Texture of the C horizon is sand, fine sand, or loamy sand.

Neilhurst Series

The Neilhurst series consists of excessively drained soils that formed in homogeneous sandy material from phosphate and silica mining operations. These soils are on broad uplands and low knolls. Slopes are smooth to convex and range from 0 to 5 percent except for steep mounds of sand adjacent to silica mines. These soils are hyperthermic, uncoated Typic Quartzipsamments.

The Neilhurst soils are associated on the landscape with Astatula, Candler, Tavares, and other soils, depending upon the mining operations. Astatula soils have high chroma in the C horizon. Candler soils are well drained and have lamellae at a depth of 60 to 80 inches. Tavares soils are moderately well drained.

Typical pedon of Neilhurst sand, 1 to 5 percent slopes; about 2,500 feet north and 1,500 east of the southwest corner of sec. 34, T. 29 S., R. 25 E.

A—0 to 3 inches; grayish brown (10YR 5/2) sand; single grained; loose; medium acid; clear wavy boundary.

C—3 to 80 inches; light gray (10YR 7/2) sand; single grained; loose; common medium distinct dark reddish brown and reddish brown streaks and splotches of organic matter and iron stains; medium acid.

Texture is sand or fine sand throughout. Reaction is strongly acid to slightly acid.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 1 or 2.

The C horizon has hue of 10YR, value of 5 to 7, and chroma of 1 to 3.

Nittaw Series

The Nittaw series consists of very poorly drained soils that formed in clayey marine sediments. These soils are on flood plains. Slopes are 0 to 2 percent. These soils are fine, montmorillonitic, hyperthermic Typic Argiaquolls.

The Nittaw soils in Polk County are taxadjuncts to the Nittaw series because they have a slightly thicker mollic epipedon than required for the series. This difference does not alter the use and behavior of the soils.

Nittaw soils are associated on the landscape with Bradenton, Chobee, and Felda soils. Bradenton and Felda soils do not have a mollic epipedon. In addition, Bradenton soils are dominantly sandy loam in the argillic horizon, and Felda soils have an argillic horizon at a depth of 20 to 40 inches. Chobee soils are dominantly sandy clay loam in the argillic horizon.

Typical pedon of Nittaw sandy clay loam, frequently flooded; on the Saddle Creek flood plain, 1,900 feet north and 350 feet east of the southwest corner of sec. 13, T. 28 S., R. 24 E.

A—0 to 6 inches; black (10YR 2/1) sandy clay loam; weak medium granular structure; friable; many fine and medium roots; slightly acid; clear smooth boundary.

Btg1—6 to 29 inches; very dark gray (10YR 3/1) sandy clay; few fine distinct pale olive (5Y 6/3) and red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; sticky; common fine and medium roots; moderately alkaline; gradual wavy boundary.

Btg2—29 to 64 inches; gray (5Y 5/1) clay; common fine prominent red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; sticky; many medium and coarse roots; moderately alkaline; diffuse wavy boundary.

Btg3—64 to 75 inches; dark gray (5Y 4/1) sandy clay loam; few fine prominent red (2.5YR 4/6) and few medium prominent light greenish gray (5G 7/1) mottles; sticky; moderately alkaline; clear wavy boundary.

Cg—75 to 80 inches; gray (10YR 5/1) loamy sand; single grained; nonsticky; moderately alkaline.

The solum is 40 to 60 inches thick. Reaction is medium acid to neutral in the A horizon, medium acid to moderately alkaline in the Btg horizon, and neutral or moderately alkaline in the Cg horizon. Some pedons have pebbles of phosphate rock or concretionary material enriched with phosphate.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1, or it is neutral in hue and has value of 2 or 3. It is 4 to 14 inches thick.

The Btg1 horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2, or it is neutral in hue and has value of 2. The Btg2 and Btg3 horizons have hue of 10YR or 5Y, value of 4 to 6, and chroma of 1 or 2. The Btg horizon is 25 to 70 inches thick. Texture is sandy clay or clay.

The Cg horizon has hue of 10YR or 5Y, value of 5 to 8, and chroma of 1 or 2; has hue of 5GY, value of 4 to 6, and chroma of 1; or is neutral and has value of 5 to 7. Texture ranges from sand to fine sandy loam.

Oldsmar Series

The Oldsmar series consists of poorly drained soils that formed in sandy and loamy marine sediments. These soils are on flatwoods. Slopes are 0 to 2 percent. These soils are sandy, siliceous, hyperthermic Alfic Arenic Haplaquods.

Oldsmar soils are associated on the landscape with EauGallie, Electra, Immokalee, Myakka, Ona, Pomona, Smyrna, and Wabasso soils. EauGallie soils have a Bh horizon within 30 inches of the surface. Electra soils are somewhat poorly drained. Immokalee, Myakka, Ona, and Smyrna soils do not have a Bt horizon. Pomona soils have a Bt horizon that has low base saturation. Wabasso soils have a Bt horizon at a depth of less than 40 inches.

Typical pedon of Oldsmar fine sand; in a pasture, 1,200 feet south and 200 feet west of the northeast corner of sec. 21, T. 29 S., R. 26 E.

Ap—0 to 6 inches; dark gray (10YR 4/1) fine sand; weak fine granular structure; very friable; many fine and medium roots; medium acid; abrupt smooth boundary.

E—6 to 36 inches; gray (10YR 6/1) fine sand; single grained; loose; many fine and medium roots; very strongly acid; clear wavy boundary.

Bh1—36 to 40 inches; black (5YR 2/1) fine sand; moderate medium granular structure; weakly cemented in parts; common fine and medium roots; very strongly acid; clear wavy boundary.

Bh2—40 to 50 inches; dark reddish brown (5YR 3/2) fine sand; moderate medium granular structure; common fine and medium roots; very strongly acid; clear wavy boundary.

Bt—50 to 80 inches; mottled grayish brown (10YR 5/2), dark brown (10YR 4/3), and olive brown (2.5Y 4/4) sandy clay loam; moderate medium subangular blocky structure; firm; few fine and medium roots; medium acid.

The solum is 60 to 80 inches thick. Reaction is extremely acid to neutral in the A, E, and Bh horizons and moderately alkaline to medium acid in the Bt horizon.

The A or Ap horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. It is 4 to 8 inches thick.

The E horizon has hue of 10YR, value of 5 to 8, and chroma of 1 or 2; has hue of 2.5Y, value of 7 or 8, and chroma of 2; or is neutral and has value of 5 to 8. It is 23 to 35 inches thick. Texture is sand or fine sand.

The Bh horizon has hue of 10YR or 5YR, value of 2 or 3, and chroma of 1 to 3; has hue of 7.5YR, value of 3 or 4, and chroma of 2; or is neutral and has value of 2. It is 8 to 18 inches thick. Texture is sand, fine sand, or loamy fine sand.

The Bt horizon has hue of 10YR, value of 4 to 7, and chroma of 1; has hue of 2.5Y or 5Y, value of 5 or 6, and chroma of 1 or 2; or is neutral and has value of 5 or 6. Mottles of gray, yellow, or brown are in some pedons. Texture is sandy loam, sandy clay loam, or fine sandy loam.

Ona Series

The Ona series consists of poorly drained soils that formed in sandy marine sediments. These soils are in broad areas on flatwoods. Slopes are 0 to 2 percent. These soils are sandy, siliceous, hyperthermic Typic Haplaquods.

Ona soils are associated on the landscape with Basinger, Immokalee, Myakka, Placid, Pomello, and Pompano soils. Basinger, Placid, and Pompano soils do not have a spodic horizon. Placid soils have an umbric horizon. Immokalee soils have a spodic horizon at a depth of more than 30 inches. Myakka soils have a spodic horizon within a depth of 30 inches. Pomello soils are better drained than the Ona soils and have a spodic horizon at a depth of 30 to 50 inches.

Typical pedon of Ona fine sand; about 2,300 feet north and 900 feet west of the southeast corner of sec. 4, T. 28 S., R. 23 E.

Ap—0 to 4 inches; black (10YR 2/1) fine sand; salt-and-pepper appearance when unrubbed; weak fine granular structure; very friable; many fine roots; neutral; clear smooth boundary.

A—4 to 10 inches; very dark gray (10YR 3/1) fine sand; some clean sand grains; weak fine granular structure; very friable; many fine roots; medium acid; clear wavy boundary.

Bh—10 to 19 inches; dark brown (7.5YR 3/2) fine sand; medium moderate subangular blocky structure; friable; many fine roots; strongly acid; clear wavy boundary.

BE—19 to 24 inches; dark brown (10YR 4/3) fine sand; single grained; loose; many fine roots; strongly acid; clear wavy boundary.

E—24 to 50 inches; grayish brown (10YR 5/2) fine sand; common fine faint dark brown (10YR 4/3) mottles; single grained; loose; very strongly acid; clear wavy boundary.

B'h1—50 to 75 inches; dark brown (7.5YR 3/2) fine sand; common medium and coarse black (5YR 2/1) weakly cemented bodies; massive; nonsticky and nonplastic; extremely acid; clear wavy boundary.

B'h2—75 to 80 inches; dark brown (7.5YR 4/2) fine sand; massive; nonsticky and nonplastic; strongly acid.

The solum is more than 40 inches thick. Texture is fine sand or sand. Reaction is extremely acid to medium acid except where lime has been added to the soil.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1. It is 7 to 10 inches thick.

The Bh horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 to 3. It is 8 to 16 inches thick.

The BE horizon has hue of 10YR, value of 3 or 4, and chroma of 3 or 4 or hue of 7.5YR, value of 4, and chroma of 4. It is 5 to 28 inches thick.

The E horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. It is 10 to 26 inches thick.

The B'h horizon has hue of 5YR to 7.5YR, value of 3, and chroma of 1 or 2. It is 10 to 38 inches thick.

Some pedons have a C horizon, which has color similar to that of the E horizon.

Paisley Series

The Paisley series consists of poorly drained soils that formed in clayey marine sediments influenced by underlying calcareous material. These soils are on low, broad flatwoods. Slopes are 0 to 2 percent. These soils are fine, montmorillonitic, hyperthermic Typic Albaqualfs.

Paisley soils are associated on the landscape with Bradenton, EauGallie, Felda, Nittaw, and Wabasso soils. Bradenton soils have a loamy Bt horizon. EauGallie and Wabasso soils have organic coatings in the upper part of the subsoil. Felda soils are sandy to a depth of 20 to 40 inches and loamy below that depth. Nittaw soils are very poorly drained and have a mollic epipedon.

Typical pedon of Paisley fine sand; about 1,880 feet south and 840 feet east of the northwest corner of sec. 20, T. 25 S., R. 23 E.

A—0 to 3 inches; very dark gray (10YR 3/1) fine sand; weak fine granular structure; very friable; slightly acid; clear smooth boundary.

E1—3 to 7 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; neutral; clear smooth boundary.

E2—7 to 14 inches; gray (10YR 5/1) fine sand; single grained; loose; neutral; clear smooth boundary.

Btg1—14 to 22 inches; gray (5Y 6/1) sandy clay; few fine prominent yellow (10YR 7/6) mottles; moderate medium subangular blocky structure; firm; mildly alkaline; gradual wavy boundary.

Btg2—22 to 30 inches; gray (10YR 6/1) sandy clay; many medium prominent yellow (10YR 7/6 and 7/8) mottles; moderate medium subangular blocky structure; firm; mildly alkaline; gradual wavy boundary.

BCg—30 to 48 inches; gray (10YR 6/1) sandy clay; few fine prominent light yellowish brown (10YR 6/4) mottles; common medium distinct soft white (10YR 8/1) carbonatic nodules; massive; friable; moderately alkaline; gradual wavy boundary.

Cg—48 to 80 inches; light gray (10YR 7/1) sandy clay; few fine distinct light yellowish brown (10YR 6/4) mottles; many medium distinct soft white (10YR 8/1) carbonatic nodules; massive; friable; moderately alkaline.

The solum is at least 40 inches thick. Reaction ranges from very strongly acid to slightly acid in the A and E horizons and from medium acid to moderately alkaline in the B and C horizons.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1. It is 3 to 6 inches thick.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 2 or less. It is 3 to 14 inches thick. Texture is fine sand or stony fine sand.

The Btg horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2; hue of 2.5Y, value of 5, and chroma of 2; or hue of 5Y, value of 6, and chroma of 1. There are many yellow mottles in most pedons. The Btg horizon is 16 to 33 inches thick. Texture is sandy clay or clay.

The BCg horizon has hue of 10YR, value of 6 or 7, and chroma of 1. It has a few yellow mottles. Bodies of soft white (10YR 8/1) carbonatic material are present. The BCg horizon is 10 to 18 inches thick. Texture is sandy clay or clay.

The Cg horizon has the same range in color and texture as that of the BCg horizon and has many medium and large pockets of soft white (10YR 8/1) carbonatic material. This horizon extends to a depth of at least 80 inches. It is often underlain by soft carbonatic material or semihard lime material.

Placid Series

The Placid series consists of very poorly drained soils that formed in marine sediments. These soils are in depressional areas and on flood plains. Slopes are 0 to 2 percent. These soils are sandy, siliceous, hyperthermic Typic Humaquepts.

Placid soils are associated on the landscape with Basinger, Myakka, Pompano, and Samsula soils. Basinger and Pompano soils do not have umbric epipedon. Myakka soils have a spodic horizon at a depth of 20 to 30 inches and do not have an umbric epipedon. Samsula soils are organic.

Typical pedon of Placid fine sand, in an area of Placid and Myakka fine sands, depressional; in a wooded area, 800 feet north and 250 feet west of the southeast corner of sec. 28, T. 29 S., R. 26 E.

A1—0 to 13 inches; black (N 2/0) fine sand; weak fine granular structure; very friable; many fine roots; extremely acid; gradual smooth boundary.

A2—13 to 18 inches; black (10YR 2/1) fine sand; single grained; loose; few fine roots; very strongly acid; gradual smooth boundary.

Cg1—18 to 28 inches; dark grayish brown (10YR 4/2) fine sand; single grained; loose; few fine roots; very strongly acid; gradual wavy boundary.

Cg2—28 to 60 inches; light gray (10YR 7/1) fine sand; single grained; loose; few fine roots; very strongly acid; gradual wavy boundary.

Cg3—60 to 80 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; extremely acid.

Texture is fine sand or sand. Reaction is extremely acid to strongly acid.

The A horizon has hue of 10YR, value of 2 to 3, and chroma of 1 or 2, or it is neutral in hue and has value of 2. It is 10 to 21 inches thick.

The Cg horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2.

Pomello Series

The Pomello series consists of moderately well drained soils that formed in sandy marine deposits. These soils are on low ridges on flatwoods. Slopes are 0 to 2 percent. These soils are sandy, siliceous, hyperthermic Arenic Haplohumods.

Pomello soils are associated on the landscape with Duette, Immokalee, Satellite, and St. Lucie soils. Duette soils have a spodic horizon at a depth of more than 50 inches. Immokalee soils are poorly drained. Satellite soils are somewhat poorly drained and do not have a spodic horizon. St. Lucie soils are excessively drained and do not have a spodic horizon.

Typical pedon of Pomello fine sand; 800 feet east and 700 feet south of the northwest corner of sec. 30, T. 29 S., R. 26 E.

Ap—0 to 5 inches; dark gray (10YR 4/1) fine sand; weak fine granular structure; very friable; many fine and medium roots; strongly acid; abrupt smooth boundary.

E—5 to 48 inches; white (10YR 8/1) fine sand; single grained; loose; few fine roots; few thin dark gray (10YR 4/1) streaks in old root channels; strongly acid; abrupt wavy boundary.

Bh1—48 to 53 inches; dark reddish brown (5YR 3/3) fine sand coated with organic matter; massive parting to weak medium subangular blocky; friable; few fine roots; very strongly acid; clear wavy boundary.

Bh2—53 to 63 inches; black (10YR 2/1) fine sand coated with organic matter; massive parting to weak fine subangular blocky; friable; few fine roots; very strongly acid; clear wavy boundary.

BC—63 to 80 inches; dark brown (7.5YR 4/2) fine sand; single grained; loose; few fine roots; very strongly acid.

The solum is more than 40 inches thick. Reaction ranges from very strongly acid to medium acid. Texture is sand or fine sand.

The A horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 2 or less, or it is neutral in hue and has value of 6 or 7. It is 2 to 6 inches thick.

The E horizon has hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 2 or less, or it is neutral in hue and has value of 6 to 8. Some pedons have streaks that have hue of 10YR, value of 2 to 4, and chroma of 1 or 2. The E horizon is 30 to 49 inches thick.

The Bh horizon has hue of 5YR to 10YR, value of 2 to 4, and chroma of 1 to 3. It is 10 to 30 inches thick.

The BC horizon has hue of 5YR to 10YR, value of 3 or 4, and chroma of 2 to 4. Some pedons have brown or yellow mottles.

Some pedons have a C horizon, which has hue of 10YR, value of 5 to 7, and chroma of 1 to 4.

Pomona Series

The Pomona series consists of poorly drained soils that formed in sandy and loamy marine sediments. These soils are in broad flatwood areas. Slopes are 0 to 2 percent. These soils are sandy, siliceous, hyperthermic Ultic Haplaquods.

Pomona soils are associated on the landscape with Adamsville, Immokalee, Myakka, and Wauchula soils. Adamsville soils do not have a spodic or an argillic horizon. Myakka and Immokalee soils do not have an argillic horizon. Wauchula soils have an argillic horizon within the control section.

Typical pedon of Pomona fine sand; 750 feet west and 1,250 feet north of the southeast corner of sec. 34, T. 26 S., R. 24 E.

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

E1—6 to 12 inches; light brownish gray (10YR 6/2) sand; single grained; loose; many fine and medium roots; very strongly acid; clear wavy boundary.

E2—12 to 21 inches; light gray (10YR 7/2) sand; single grained; loose; many fine and medium roots; strongly acid; abrupt wavy boundary.

Bh—21 to 26 inches; dark reddish brown (5YR 3/3) loamy fine sand; moderate medium granular structure; firm; few fine and medium roots; sand grains coated with organic matter; extremely acid; gradual wavy boundary.

E'1—26 to 34 inches; very pale brown (10YR 7/3) fine sand; weak medium granular structure; friable; many uncoated sand grains; very strongly acid; gradual wavy boundary.

E'2—34 to 48 inches; light gray (10YR 7/1) fine sand; common medium distinct yellowish brown (10YR 5/6) and white (10YR 8/1) mottles; weak medium granular structure; friable; medium acid; gradual wavy boundary.

Btg1—48 to 60 inches; light gray (10YR 7/1) fine sandy loam; common medium distinct yellowish brown (10YR 5/8) mottles; moderate medium angular blocky and subangular blocky structure; firm; sand grains coated and bridged with clay; extremely acid; clear wavy boundary.

Btg2—60 to 73 inches; light gray (10YR 7/1) sandy clay loam; few fine distinct yellowish brown (10YR 5/8) and yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; firm; sand grains coated and bridged with clay; strongly acid; clear wavy boundary.

Cg—73 to 80 inches; light gray (5Y 7/1) loamy sand; massive; friable; very strongly acid.

The solum is at least 60 inches thick. Reaction ranges from extremely acid to strongly acid in all horizons except the E′ horizon, which ranges from extremely acid to medium acid.

The Ap or A horizon has hue of 10YR, value of 2 to 4, and chroma of 1. It is 3 to 8 inches thick.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. It is 9 to 24 inches thick. Texture is sand or fine sand.

The Bh horizon has hue of 5YR, value of 2 or 3, and chroma of 1 to 3; has hue of 7.5YR, value of 3 or 4, and chroma of 2; has hue of 10YR, value of 2 or 3, and chroma of 1 or 2; or is neutral and has value of 2. It is 5 to 18 inches thick. Texture is sand or fine sand.

The E′ horizon has hue of 10YR, value of 5 to 7, and chroma of 1 to 3. It is up to 24 inches thick. Texture is sand or fine sand.

The Btg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2; has hue of 5Y, value of 7, and chroma of 1; has hue of 5GY, value of 5 or 6, and chroma of 1; or is neutral and has value of 5. It is 10 to 38 inches thick. Texture ranges from sandy loam to sandy clay loam.

The Cg horizon has hue of 10YR or 5Y, value of 5 to 7, and chroma of 1. Texture ranges from fine sand to sandy loam.

Pompano Series

The Pompano series consists of poorly drained, rapidly permeable soils that formed in sandy marine sediments. These soils are on flatwoods. Slopes are 0 to 2 percent. These soils are siliceous, hyperthermic Typic Psammaquents.

Pompano soils are associated on the landscape with Anclote, Basinger, Immokalee, Myakka, and Placid soils. Anclote and Placid soils have a thicker epipedon than that of the Pompano soils. Basinger, Immokalee, and Myakka soils have a Bh horizon.

Typical pedon of Pompano fine sand; 1,800 feet south and 1,200 feet east of the northwest corner of sec. 25, T. 29 S., R. 25 E.

Ap—0 to 6 inches; dark gray (10YR 4/1) fine sand; weak fine granular structure; friable; many fine roots; slightly acid; abrupt smooth boundary.

A—6 to 15 inches; grayish brown (10YR 5/2) fine sand; few fine distinct strong brown (7.5YR 5/6) mottles; single grained; loose; many fine roots; medium acid; gradual wavy boundary.

C1—15 to 35 inches; very pale brown (10YR 7/3) fine sand; few fine distinct yellow (10YR 7/6) mottles; single grained; loose; few fine roots; medium acid; gradual wavy boundary.

C2—35 to 80 inches; light gray (10YR 7/1) fine sand; single grained; loose; medium acid.

Reaction is very strongly acid to mildly alkaline.

The Ap and A horizons have hue of 10YR, value of 2 to 5, and chroma of 1 or 2. Where the value is 3 or less, the horizon is less than 6 inches thick.

The C horizon has hue of 10YR, value of 5 to 7, and chroma of 1 to 3. Texture is sand or fine sand.

Samsula Series

The Samsula series consists of very poorly drained soils that formed in hydrophytic nonwoody plant remains. These soils are in swamps and marshes. Slopes are 0 to 2 percent. These soils are sandy or sandy-skeletal, siliceous, dysic, hyperthermic Terric Medisaprists.

Samsula soils are associated on the landscape with Basinger, EauGallie, Floridana, Immokalee, Myakka, Placid, and Pomona soils, which are all mineral soils. These soils are in higher positions on the landscape than the Samsula soils.

Typical pedon of Samsula muck; 1,320 feet south and 2,310 feet east of the northwest corner of sec. 33, T. 28 S., R. 27 E.

Oa1—0 to 7 inches; well decomposed muck, black (5YR 2/1) rubbed and pressed; about 10 percent fiber unrubbed, 5 percent rubbed; moderate fine and medium granular structure; friable; many fine and medium and few coarse roots; about 5 percent mineral material; sodium pyrophosphate extract color dark reddish gray (5YR 4/2); extremely acid; clear smooth boundary.

Oa2—7 to 27 inches; well decomposed muck, dark reddish brown (5YR 2/2) rubbed and pressed; about 25 percent fiber unrubbed, 10 percent rubbed; moderate fine and medium granular structure; friable; few fine roots; about 5 percent mineral material; sodium pyrophosphate extract color reddish brown (5YR 4/4); extremely acid; clear smooth boundary.

Oa3—27 to 31 inches; well decomposed muck, black (5YR 2/1) rubbed and pressed; about 30 percent fiber unrubbed, 10 percent rubbed; massive; very friable; about 5 percent mineral material; sodium pyrophosphate extract color light yellowish brown (10YR 6/4); extremely acid; abrupt smooth boundary.

C—31 to 52 inches; black (N 2/0) sand; single grained; loose; extremely acid; gradual smooth boundary.

Cg—52 to 80 inches; grayish brown (10YR 5/2) sand; single grained; loose; very strongly acid.

The organic matter is 16 to 40 inches thick. Measured in 0.01 molar calcium chloride solution, reaction is extremely acid in the organic horizons and extremely acid to medium acid in the mineral horizons.

The Oa horizon has hue of 10YR, value of 2, and chroma of 1 or 2; has hue of 5YR, value of 2 or 3, and chroma of 1 to 3; or is neutral and has value of 2.

The C horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2, or it is neutral in hue and has value of 2 or 3. Texture is mucky fine sand, fine sand, or sand. The Cg part has hue of 10YR, value of 5 to 7, and chroma of 1 or 2, or it is neutral in hue and has value of 5 to 7. Texture is sand, fine sand, or loamy sand.

Satellite Series

The Satellite series consists of somewhat poorly drained soils that formed in sandy marine sediments. These soils are on low ridges on flatwoods. Slopes are 0 to 2 percent. These soils are hyperthermic, uncoated Aquic Quartzipsamments.

Satellite soils are associated on the landscape with Archbold, Immokalee, Myakka, Pomello, Pompano, and St. Lucie soils. Archbold and St. Lucie soils are better drained than the Satellite soils and are in higher positions on the landscape. Immokalee, Myakka, and Pomello soils have a spodic horizon. Pompano soils are poorly drained and are in lower positions on the landscape.

Typical pedon of Satellite sand; in an improved pasture, 950 feet north and 1,100 feet east of the southwest corner of sec. 18, T. 26 S., R. 28 E.

Ap—0 to 6 inches; sand, very dark gray (10YR 3/1) rubbed; salt-and-pepper appearance unrubbed; single grained; loose; few fine and medium roots; neutral; clear wavy boundary.

C1—6 to 18 inches; gray (10YR 5/1) sand; single grained; loose; few fine and medium roots; slightly acid; clear wavy boundary.

C2—18 to 60 inches; light gray (10YR 7/1) sand; few medium prominent very dark grayish brown (10YR 3/2) stains along root channels; single grained; loose; few fine and medium roots; strongly acid; gradual wavy boundary.

C3—60 to 80 inches; grayish brown (10YR 5/2) sand; single grained; strongly acid.

Reaction ranges from very strongly acid to mildly alkaline.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It is 4 to 8 inches thick.

The C horizon has hue of 10YR, value of 5 to 8, and chroma of 1 or 2. Some pedons have mottles in shades of yellow, brown, or red. Texture is sand or fine sand.

Smyrna Series

The Smyrna series consists of poorly drained soils that formed in sandy marine sediments. These soils are on broad flatwoods. Slopes are 0 to 2 percent. These soils are sandy, siliceous, hyperthermic Aeric Haplaquods.

Smyrna soils are associated on the landscape with Basinger, Immokalee, Myakka, and Placid soils. Basinger soils have a Bh/E horizon. Immokalee soils have a Bh horizon at a depth of 30 to 50 inches. Myakka soils have a Bh horizon at a depth of 20 to 30 inches. Placid soils have an umbric epipedon and are very poorly drained.

Typical pedon of Smyrna fine sand, in an area of Smyrna and Myakka fine sands; about 2,900 feet south and 200 feet east of the northwest corner of sec. 24, T. 32 S., R. 26 E.

A—0 to 4 inches; fine sand, black (10YR 2/1) rubbed; salt-and-pepper appearance unrubbed; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; clear wavy boundary.

E—4 to 12 inches; gray (10YR 6/1) fine sand; single grained; loose; few fine roots; very strongly acid; clear wavy boundary.

Bh—12 to 18 inches; dark brown (7.5YR 3/2) fine sand; weak fine subangular blocky structure; very friable; few fine roots; very strongly acid; gradual wavy boundary.

BE&Bh—18 to 25 inches; brown (10YR 5/3) fine sand (BE); many fine distinct reddish brown (5YR 5/3) bodies (Bh); single grained; loose; very strongly acid; gradual wavy boundary.

E'—25 to 42 inches; very pale brown (10YR 7/3) fine sand; common medium prominent brownish yellow (10YR 6/6) mottles; single grained; loose; medium acid; clear wavy boundary.

B'h—42 to 48 inches; very dark brown (10YR 2/2) fine sand; weak fine subangular blocky structure; very friable; strongly acid; gradual wavy boundary.

C1—48 to 65 inches; brown (10YR 5/3) fine sand; common medium prominent yellowish brown (10YR

5/6) mottles; many large distinct light brownish gray (10YR 6/2) loamy sand nodules; very friable; strongly acid; gradual wavy boundary.

C2—68 to 80 inches; light brownish gray (10YR 6/2) fine sand; single grained; loose; strongly acid.

Texture generally is sand or fine sand. Loamy sand is in the lower part of some pedons. Reaction ranges from extremely acid to neutral.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1, or it is neutral in hue and has value of 2 to 4. It is 4 to 8 inches thick.

The E horizon has hue of 10YR, value of 5 to 8, and chroma of 1 or 2. It is 4 to 10 inches thick.

The Bh horizon has hue of 5YR, value of 2 or 3, and chroma of 1 or 2; has hue of 10YR, value of 2, and chroma of 1 or 2; has hue of 7.5YR, value of 3, and chroma of 2; or is neutral and has value of 2. The BE&BH horizon has hue of 7.5YR, value of 3 to 4, and chroma of 2 or 4 or hue of 10YR, value of 3 to 5, and chroma of 3. Some pedons do not have a BE&BH horizon.

The E′ and Bh′ horizons are similar in color and texture to the E and Bh horizons. Some pedons do not have an E′ or Bh′ horizon.

The C horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2. Some pedons have loamy sand nodules that are similar in color to the matrix, and some pedons have yellow, brown, or gray mottles.

Sparr Series

The Sparr series consists of somewhat poorly drained soils that formed in sandy and loamy marine deposits. These soils are on uplands and knolls on flatwoods. Slopes range from 0 to 5 percent. These soils are loamy, siliceous, hyperthermic Grossarenic Paleudults.

Sparr soils are associated on the landscape with Apopka, Candler, and Tavares soils. Apopka soils are well drained. Candler and Tavares soils do not have an argillic horizon. Candler soils are excessively drained, and Tavares soils are moderately well drained. In most areas, the associated soils are in higher positions on the landscape than the Sparr soils.

Typical pedon of Sparr sand, 0 to 5 percent slopes; 1,000 feet north and 900 feet west of the southeast corner of sec. 23, T. 26 S., R. 25 E.

Ap—0 to 8 inches; dark gray (10YR 4/1) sand; single grained; friable; many fine and medium roots; medium acid; clear smooth boundary.

E1—8 to 20 inches; brown (10YR 4/3) sand; single grained; loose; many fine and medium roots; medium acid; clear wavy boundary.

E2—20 to 38 inches; light yellowish brown (10YR 6/4) sand; few fine faint white mottles; single grained; loose; many fine and medium roots; medium acid; clear wavy boundary.

E3—38 to 46 inches; very pale brown (10YR 7/4) sand; common medium prominent yellowish brown (10YR 5/6) and white (10YR 8/1) mottles; single grained; loose; many fine and medium roots; medium acid; clear wavy boundary.

E4—46 to 57 inches; very pale brown (10YR 7/3) sand; few fine distinct yellow (10YR 7/6) mottles; single grained; loose; many fine and medium roots; medium acid; clear wavy boundary.

Bt1—57 to 62 inches; very pale brown (10YR 7/3) sandy clay loam; many medium prominent yellowish brown (10YR 5/8) and yellow (10YR 7/6) mottles; moderate medium subangular blocky structure; firm; common fine and medium roots; strongly acid; clear wavy boundary.

Bt2—62 to 66 inches; yellowish brown (10YR 5/6) sandy clay loam; many medium distinct yellowish brown (10YR 5/8) and prominent light gray (10YR 7/2) mottles; moderate medium subangular blocky structure; firm; common fine and medium roots; about 2 percent soft plinthite; strongly acid; clear wavy boundary.

Btg—66 to 80 inches; light gray (10YR 7/2) sandy clay loam; common medium prominent dark red (2.5YR 3/6) and strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm; common fine and medium roots; dark grayish brown coatings in old root channels; strongly acid.

The solum is more than 60 inches thick. Reaction ranges from extremely acid to slightly acid except where lime has been added to the soil.

The A horizon has hue of 10YR, value of 2 to 5, and chroma of 1 or 2. It is 4 to 10 inches thick.

The E horizon has hue of 10YR, value of 4 to 8, and chroma of 1 to 4. It is 31 to 64 inches thick. Texture is fine sand or sand.

The Bt horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 3 to 8. Mottles are in shades of gray, yellow, brown, and red. Texture is sandy loam, fine sandy loam, or sandy clay loam.

The Btg horizon is similar in color and texture to the Bt horizon except it has chroma of 2 or less.

St. Augustine Series

The St. Augustine series consists of somewhat poorly drained soils that formed from fill material. The fill material is a result of dredging the Kissimmee River. These soils are on long, narrow ridges or mounds along the Kissimmee River. Slopes are 0 to 2 percent. These soils are sandy, siliceous, hyperthermic Udalfic Arents.

St. Augustine soils are associated on the landscape with Floridana, Kaliga, Nittaw, and Samsula soils. Floridana soils have a mollic epipedon, and they have an argillic horizon at a depth of 20 to 40 inches. Kaliga and Samsula soils are organic. Kaliga soils have a loamy horizon with high base saturation at a depth of 16 to 40 inches. Nittaw soils have fine textured material within 20 inches of the surface.

Typical pedon of St. Augustine sand; 1,000 feet west and 1,100 feet north of the southeast corner of sec. 14, T. 31 S., R. 31 E.

A—0 to 2 inches; gray (10YR 6/1) sand; single grained; loose; many fine, medium, and coarse fragments of shell; moderately alkaline; clear smooth boundary.

C1—2 to 25 inches; light gray (10YR 7/1) sand; single grained; loose; many fine and medium fragments of shell; moderately alkaline; gradual wavy boundary.

C2—25 to 60 inches; light gray (10YR 7/1) sand; single grained; loose; few pockets of black (10YR 2/1) sandy loam and sandy clay loam; many fine and medium fragments of shell; moderately alkaline; gradual wavy boundary.

C3—60 to 80 inches; light gray (10YR 7/1) sand; single grained; loose; common fine fragments of shell; moderately alkaline.

Reaction is slightly acid to moderately alkaline.

The A horizon has hue of 10YR, value of 6, and chroma of 1 or hue of 2.5Y, value of 5 to 7, and chroma of 1 or 2. It is 2 to 6 inches thick.

The C horizon has hue of 10YR, value of 7, and chroma of 1 or 2 or hue of 2.5Y, value of 6 or 7, and chroma of 1 or 2.

St. Johns Series

The St. Johns series consists of poorly drained soils that formed in sandy marine deposits. These soils are on flatwoods and in sloughs on flatwoods. Slopes are 0 to 2 percent. These soils are sandy, siliceous, hyperthermic Typic Haplaquods.

St. Johns soils are associated on the landscape with Astatula, Basinger, Immokalee, Myakka, Ona, Placid, and Pomello soils. Astatula soils are excessively drained and do not have a Bh horizon. Basinger soils have a thinner surface layer than that of the St. Johns soils, and their Bh horizon is not as well developed. Immokalee, Myakka, and Ona soils are poorly drained and have a thinner surface layer than that of the St. Johns soils. Placid soils do not have a Bh horizon. Pomello soils are moderately well drained. Astatula and Pomello soils are in the highest positions on the landscape, and Placid soils are in the lowest positions. Immokalee and Ona soils are in slightly higher positions on the landscape than the St. Johns soils. Myakka soils are in depressions and in slightly higher positions on the landscape than the St. Johns soils.

Typical pedon of St. Johns sand; in a slough, about 2,300 feet west and 2,300 feet north of the southeast corner of sec. 8, T. 32 S., R. 30 E.

A—0 to 12 inches; black (10YR 2/1) sand; weak fine granular structure; friable; many fine and medium roots; strongly acid; abrupt wavy boundary.

E—12 to 22 inches; gray (10YR 5/1) sand; single grained; loose; common fine and medium roots; strongly acid; abrupt smooth boundary.

Bh1—22 to 40 inches; black (10YR 2/1) sand; massive; friable; weakly cemented; few fine roots; strongly acid; gradual wavy boundary.

Bh2—40 to 65 inches; very dark grayish brown (10YR 3/2) sand; massive; friable; weakly cemented; few fine roots; strongly acid; gradual wavy boundary.

C—65 to 80 inches; brown (10YR 5/3) sand; single grained; loose; strongly acid.

The solum is 55 to more than 80 inches thick. Reaction is strongly acid to extremely acid. Texture is sand or fine sand.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It is 8 to 14 inches thick. In some pedons, a few inches of muck or mucky fine sand are on the surface. The E horizon has hue of 10YR, value of 5 to 7, and chroma of 2 or less. It is 4 to 20 inches thick. Total thickness of the A and E horizons is less than 30 inches.

The Bh horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2; hue of 7.5YR, value of 3, and chroma of 2; or hue of 5YR, value of 2 or 3, and chroma of 2 or less. It is 12 to 45 inches thick.

The C horizon has hue of 10YR, value of 4 to 7, and chroma of 1 to 3.

St. Lucie Series

The St. Lucie series consists of excessively drained soils that formed in sandy marine or eolian deposits. These soils are on dunelike ridges and isolated knolls.

Slopes range from 0 to 5 percent. These soils are hyperthermic, uncoated Typic Quartzipsamments.

St. Lucie soils are associated on the landscape with Archbold, Astatula, Candler, Duette, and Tavares soils. Archbold and Tavares soils are moderately well drained. Astatula soils have chroma of 3 or higher in the C horizon. Candler soils have lamellae at a depth of 50 to 80 inches. Duette soils are moderately well drained and have a spodic horizon at a depth of 50 to 80 inches.

Typical pedon of St. Lucie fine sand, 0 to 5 percent slopes; in a sand pine scrub, about 4,000 feet south and 1,800 feet west of the northeast corner of sec. 26, T. 29 S., R. 25 E.

A—0 to 3 inches; gray (10YR 5/1) fine sand; weak fine granular structure; very friable; common fine and medium roots; extremely acid; clear smooth boundary.

C1—3 to 60 inches; white (10YR 8/1) fine sand; single grained; loose; few medium roots; very strongly acid; clear wavy boundary.

C2—60 to 80 inches; white (10YR 8/2) fine sand; single grained; loose; few medium roots; very strongly acid.

Reaction ranges from neutral to extremely acid.

The A horizon has hue of 10YR, value of 4 to 6, and chroma of 1. It is 3 to 5 inches thick.

The C horizon has hue of 10YR, value of 6 to 8, and chroma of 1 or 2. Texture is sand or fine sand.

Tavares Series

The Tavares series consists of moderately well drained soils that formed in sandy marine sediments. These soils are on broad uplands and knolls on flatwoods. Slopes range from 0 to 5 percent. These soils are hyperthermic, uncoated Typic Quartzipsamments.

Tavares soils are associated on the landscape with Adamsville, Astatula, Candler, and Millhopper soils. Adamsville soils are in lower positions on the landscape than Tavares soils and are somewhat poorly drained. Astatula and Candler soils are in the highest positions on the landscape and are excessively drained. Millhopper soils have loamy material within a depth of 80 inches.

Typical pedon of Tavares fine sand, 0 to 5 percent slopes; 600 feet east and 700 feet south of the northwest corner of sec. 35, T. 27 S., R. 23 E.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) fine sand; weak fine granular structure; very friable; few fine roots; many uncoated sand grains; very strongly acid; clear smooth boundary.

C1—8 to 17 inches; light yellowish brown (10YR 6/4) fine sand; single grained; loose; few fine roots; many uncoated sand grains; very strongly acid; gradual smooth boundary.

C2—17 to 30 inches; light yellowish brown (10YR 6/4) fine sand; common fine prominent strong brown (7.5YR 4/6) mottles; single grained; loose; few fine and medium roots; many uncoated sand grains; very strongly acid; gradual wavy boundary.

C3—30 to 52 inches; pale brown (10YR 6/3) fine sand; common medium prominent yellowish brown (10YR 5/8) mottles; single grained; loose; many uncoated sand grains; extremely acid; gradual smooth boundary.

C4—52 to 80 inches; very pale brown (10YR 7/3) fine sand; many medium prominent brownish yellow (10YR 6/8) mottles; single grained; loose; many uncoated sand grains; very strongly acid.

Reaction ranges from extremely acid to medium acid except where lime has been added.

The A or Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It is 4 to 9 inches thick.

The C1 and C2 horizons have hue of 10YR, value of 6 to 8, and chroma of 3 or 4, or value of 5 and chroma of 3 to 8. The C3 and C4 horizons have hue of 10YR, value of 6 to 8, and chroma of 1 to 4. Mottles in shades of brown or red are in some pedons. Texture is sand or fine sand.

Valkaria Series

The Valkaria series consists of poorly drained soils that formed in sandy marine sediments. These soils are in sloughs on flatwoods. Slopes are 0 to 2 percent. These soils are siliceous, hyperthermic Spodic Psammaquents.

Valkaria soils are associated on the landscape with Basinger, Felda, Holopaw, Immokalee, Malabar, and Myakka soils. Basinger soils have a discontinuous Bh/E horizon. Felda, Holopaw, and Malabar soils have a Bt horizon. Immokalee and Myakka soils have a Bh horizon and are in slightly higher positions on the landscape than the Valkaria soils.

Typical pedon of Valkaria sand; 1,000 feet west and 1,400 feet south of the northeast corner of sec. 29, T. 32 S., R. 31 E.

A—0 to 5 inches; black (10YR 2/1) sand; single grained; loose; strongly acid; clear smooth boundary.

E—5 to 26 inches; light gray (10YR 7/2) sand; single grained; loose; strongly acid; clear wavy boundary.

Bw1—26 to 32 inches; yellowish brown (10YR 5/8) sand; few fine prominent light gray (10YR 7/2) mottles; single grained; loose; medium acid; gradual wavy boundary.

Bw2—32 to 46 inches; very pale brown (10YR 7/3) sand; single grained; loose; medium acid; gradual wavy boundary.

C1—46 to 58 inches; light gray (10YR 7/2) sand; single grained; loose; neutral; gradual wavy boundary.

C2—58 to 80 inches; white (10YR 8/2) sand; single grained; loose; neutral.

The solum is at least 40 inches thick. Texture is sand or fine sand. Reaction ranges from very strongly acid to neutral in the solum and from very strongly acid to mildly alkaline in the substratum.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. It is 4 to 6 inches thick.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. It is 7 to 21 inches thick.

Some pedons have a BE horizon, which has hue of 10YR, value of 5 to 7, and chroma of 3 or 4.

The Bw1 horizon has hue of 10YR to 2.5Y, value of 5 to 7, and chroma of 4 to 8. The Bw2 horizon has hue of 10YR, value of 5 to 7, and chroma of 3 or 4. The Bw horizon has mottles in shades of gray, yellow, or brown. It is 18 to 40 inches thick.

The C horizon has hue of 10YR, value of 5 to 8, and chroma of 1 or 2.

Wabasso Series

The Wabasso series consists of poorly drained soils that formed in sandy and loamy marine deposits. These soils are on broad flatwoods. Slopes are 0 to 2 percent. These soils are sandy, siliceous, hyperthermic Alfic Haplaquods.

Wabasso soils are associated on the landscape with EauGallie, Felda, Floridana, Holopaw, Malabar, and Pomona soils. EauGallie and Pomona soils have a Bt horizon at a depth of more than 40 inches. They are in the same landscape positions as the Wabasso soils. Felda, Floridana, Holopaw, and Malabar soils do not have a spodic horizon and are in slightly lower positions. Floridana soils are very poorly drained. Holopaw and Malabar soils have a Bt horizon at a depth of more than 40 inches. Pomona soils have less than 35 percent base saturation in the Bt horizon.

Typical pedon of Wabasso fine sand; 2,000 feet north and 2,800 feet east of the southwest corner of sec. 18, T. 28 S., R. 25 E.

Ap—0 to 7 inches; fine sand, very dark gray (10YR 3/1) when rubbed; salt-and-pepper appearance when unrubbed; weak fine granular structure; very friable; many fine and few medium roots; neutral; clear smooth boundary.

E—7 to 22 inches; light gray (10YR 7/1) fine sand; few medium prominent very dark grayish brown (10YR 3/2) stains around root channels; single grained; loose; many fine roots; neutral; clear smooth boundary.

Bh—22 to 30 inches; dark brown (7.5YR 3/2) fine sand; weak medium subangular blocky structure; friable; many fine roots; slightly acid; clear wavy boundary.

BE—30 to 35 inches; dark brown (7.5YR 4/4) fine sand; weak fine subangular blocky structure; very friable; few fine roots; medium acid; clear wavy boundary.

Btg1—35 to 51 inches; gray (10YR 6/1) sandy clay loam; few fine distinct light yellowish brown (2.5Y 6/4) and many medium distinct brown (7.5YR 5/4) mottles; moderate coarse subangular blocky structure; firm; slightly sticky and slightly plastic; few fine roots; very strongly acid; gradual wavy boundary.

Btg2—51 to 67 inches; greenish gray (5GY 6/1) fine sandy loam; common medium prominent yellowish brown (10YR 5/8) and few fine faint light olive brown mottles; moderate coarse subangular blocky structure; firm; slightly sticky and slightly plastic; few fine roots; strongly acid; gradual wavy boundary.

Cg—67 to 80 inches; light greenish gray (5GY 7/1) fine sandy loam; common medium distinct grayish brown (2.5Y 5/2) mottles; massive; firm; medium acid.

The solum is more than 45 inches thick.

The A or Ap horizon has value of 3 or 4 and chroma of 1. It is 5 to 8 inches thick. Reaction ranges from extremely acid to slightly acid except where lime has been added to the soil.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. It is 10 to 19 inches thick. Texture is fine sand or sand. Reaction ranges from extremely acid to slightly acid except where lime has been added to the soil.

The Bh horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 or 2 or hue of 5YR, value of 2 or 3, and chroma of 2. It is 8 to 10 inches thick. Texture is fine sand, sand, or loamy sand. Reaction ranges from very strongly acid to neutral.

The BE horizon has hue of 10YR or 7.5YR, value of 4, and chroma of 3 or 4. It is as much as 8 inches thick. Texture is sand or fine sand. Reaction ranges from strongly acid to moderately alkaline. Some pedons do not have a BE horizon.

The Btg horizon has hue of 10YR, value of 5 or 6, and chroma of 1; hue of 10YR, value of 5, and chroma of 6; or hue of 5GY, value of 6 or 7, and chroma of 1. It has few to common brown or gray mottles. This horizon is 17 to 46 inches thick. Texture is sandy loam, fine sandy loam, or sandy clay loam. Reaction ranges from strongly acid to moderately alkaline.

The Cg horizon has hue of 5GY, value of 6 or 7, and chroma of 1, or it is neutral in hue and has value of 6. It has few to common brown or yellow mottles. Texture is sandy loam, fine sandy loam, or sandy clay loam. Reaction ranges from strongly acid to moderately alkaline.

Wauchula Series

The Wauchula series consists of poorly drained soils that formed in sandy and loamy marine sediments. These soils are in broad areas on flatwoods. Slopes are 0 to 2 percent. These soils are sandy, siliceous, hyperthermic Ultic Haplaquods.

Wauchula soils are associated on the landscape with Basinger, EauGallie, Immokalee, Myakka, Oldsmar, Ona, Placid, Pomello, and Pomona soils. Basinger, Immokalee, Myakka, Ona, Placid, and Pomello soils do not have an argillic horizon. EauGallie and Oldsmar soils have more than 35 percent base saturation in the argillic horizon. Pomona soils have an argillic horizon at a depth of more than 40 inches. Basinger and Placid soils are in lower positions on the landscape than the Wauchula soils.

Typical pedon of Wauchula fine sand; in a wooded area, 3,600 feet east and 2,300 feet south of the northwest corner of sec. 15, T. 26 S., R. 25 E.

A—0 to 7 inches; black (10YR 2/1) fine sand; single grained; loose; strongly acid; abrupt smooth boundary.

E1—7 to 10 inches; gray (10YR 5/1) fine sand; single grained; loose; strongly acid; clear smooth boundary.

E2—10 to 18 inches; gray (10YR 6/1) fine sand; single grained; loose; strongly acid; abrupt smooth boundary.

Bh1—18 to 21 inches; very dark brown (10YR 2/2) fine sand; weak fine subangular blocky structure; friable; strongly acid; clear smooth boundary.

Bh2—21 to 26 inches; dark brown (7.5YR 3/2) fine sand; weak fine subangular blocky structure; few fine distinct very dark brown (10YR 2/2) organic bodies; friable; strongly acid; clear smooth boundary.

E'—26 to 33 inches; dark grayish brown (10YR 4/2) fine sand; single grained; loose; strongly acid; clear smooth boundary.

Btg1—33 to 38 inches; light brownish gray (10YR 6/2) fine sandy loam; weak medium subangular blocky structure; friable; strongly acid; clear smooth boundary.

Btg2—38 to 56 inches; light gray (10YR 7/2) sandy clay loam; few fine prominent brownish yellow (10YR 6/6) mottles; moderate medium subangular blocky structure; firm; strongly acid; clear smooth boundary.

Btg3—56 to 70 inches; gray (5Y 6/1) fine sandy loam; common medium prominent strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; strongly acid; clear smooth boundary.

Cg—70 to 80 inches; light gray (5Y 7/1) fine sandy loam; few fine faint yellowish brown mottles; massive; firm; strongly acid.

The solum is at least 50 inches thick. Reaction is strongly acid to extremely acid.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1. It is 4 to 8 inches thick.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. It is 7 to 18 inches thick. Texture is sand or fine sand.

The Bh horizon has hue of 10YR, 7.5YR, or 5YR, value of 2 or 3, and chroma of 3 or less. It is 1 to 14 inches thick. Texture is sand or fine sand.

The E' horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. It is 4 to 11 inches thick. Texture is sand or fine sand. Some pedons do not have an E' horizon.

The Btg horizon has hue of 10YR, 2.5Y, or 5Y, value of 5 or 6, and chroma of 2 or less. It has brown, yellow, or red mottles. It is 15 to 40 inches thick. Texture is sandy clay loam, sandy loam, or fine sandy loam.

The Cg horizon has hue of 10YR or 5Y, value of 4 to 7, and chroma of 2 or less. Texture is dominantly fine sandy loam or sandy loam.

Winder Series

The Winder series consists of very poorly drained soils that formed in loamy marine material. These soils are in depressional areas on flood plains. Slopes are 0 to 2 percent. These soils are fine-loamy, siliceous, hyperthermic Typic Glossaqualfs.

Winder soils are associated on the landscape with Chobee, Felda, Floridana, Malabar, and Valkaria soils. Chobee and Floridana soils have a mollic epipedon. Felda soils have an argillic horizon at a depth of 20 to 40 inches. Malabar and Valkaria soils are poorly drained and are in slightly higher positions on the landscape than the Winder soils. In addition, Malabar soils have a Bw horizon and an argillic horizon at a depth of more than 40 inches. Valkaria soils have a Bw horizon but do not have an argillic horizon.

Typical pedon of Winder fine sand, depressional; 200 feet east and 400 feet south of the northwest corner of sec. 27, T. 32 S., R. 31 E.

A—0 to 4 inches; dark gray (10YR 4/1) fine sand; single grained; loose; strongly acid; abrupt smooth boundary.

Eg—4 to 16 inches; light brownish gray (10YR 6/2) fine sand; few fine distinct brownish yellow mottles; single grained; loose; medium acid; gradual irregular boundary.

B/A—16 to 20 inches; dark gray (10YR 4/1) sandy clay loam (B); common fine and medium prominent yellowish brown (10YR 5/8) mottles; common coarse distinct gray (10YR 5/1) vertical tongues of loamy sand (A) and few medium faint light brownish gray (10YR 6/2) streaks of sand; moderate medium subangular blocky structure; firm; moderately alkaline; gradual irregular boundary.

Btg1—20 to 42 inches; dark gray (10YR 4/1) sandy clay loam; many medium and coarse prominent yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm; moderately alkaline; clear smooth boundary.

Btg2—42 to 50 inches; dark gray (5Y 4/1) sandy clay loam; common medium prominent olive yellow (5Y 6/6) and strong brown (7.5YR 4/6) mottles; moderate medium subangular blocky structure; firm; moderately alkaline; clear smooth boundary.

Cg—50 to 80 inches; olive gray (5Y 5/2) sandy loam; massive; friable; moderately alkaline.

The solum is 22 to 54 inches thick. Reaction is medium acid to mildly alkaline in the A and E horizons, neutral to moderately alkaline in the B horizon, and mildly alkaline or moderately alkaline in the C horizon.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1. It is 3 to 6 inches thick.

The Eg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2, or value of 4 and chroma of 1. It is 7 to 12 inches thick. Texture is sand, fine sand, or loamy sand.

The B/A horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 7, and chroma of 1 or 2, or it is neutral in hue and has value of 4 to 7. Mottles are in shades of yellow, brown, or gray. Texture ranges from sandy loam to sandy clay loam in the B part and is sand or loamy sand in the A part.

The Btg horizon has hue of 10YR or 5Y, value of 4 to 7, and chroma of 1 or 2, or it is neutral in hue and has value of 4 to 7. Mottles are in shades of yellow, brown, or gray. This horizon is 11 to 43 inches thick. Texture ranges from sandy loam to sandy clay loam. Clay content ranges from 18 to 35 percent.

The Cg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. Texture is loamy sand, sandy loam, or sandy clay loam.

Zolfo Series

The Zolfo series consists of somewhat poorly drained soils that formed in sandy marine sediments. These soils are on low, broad ridges on flatwoods. Slopes are 0 to 2 percent. These soils are sandy, siliceous, hyperthermic Grossarenic Entic Haplohumods.

Zolfo soils are associated on the landscape with Adamsville, Immokalee, Pomello, and Tavares soils. Adamsville and Tavares soils do not have a Bh horizon. Immokalee and Pomello soils have a Bh horizon at a depth of 30 to 50 inches. Tavares soils are in higher positions on the landscape than the Zolfo soils and are moderately well drained. Immokalee soils are in the lower positions and are poorly drained.

Typical pedon of Zolfo fine sand; in an improved pasture, 2,000 feet east and 1,400 feet south of the northwest corner of sec. 28, T. 28 S., R. 23 E.

Ap—0 to 7 inches; very dark gray (10YR 3/1) fine sand; weak fine and medium granular structure; very friable; many fine and medium roots; slightly acid; clear smooth boundary.

E1—7 to 14 inches; brown (10YR 5/3) fine sand; single grained; loose; many fine and medium roots; medium acid; clear smooth boundary.

E2—14 to 30 inches; pale brown (10YR 6/3) fine sand; single grained; loose; common fine and medium roots; medium acid; clear smooth boundary.

E3—30 to 67 inches; light gray (10YR 7/2) fine sand; few medium distinct brownish yellow (10YR 6/8) mottles; single grained; loose; common fine and medium roots; strongly acid; clear smooth boundary.

BE—67 to 71 inches; brown (7.5YR 5/2) fine sand; weak coarse subangular blocky structure; friable; few fine roots; medium acid; clear smooth boundary.

Bh—71 to 80 inches; dark reddish brown (5YR 2/2) fine sand; weak coarse subangular blocky structure; friable; medium acid.

The solum is at least 80 inches thick. Reaction ranges from very strongly acid to neutral in the A, E, and BE horizons and from extremely acid to slightly acid in the Bh horizon.

The A or Ap horizon has hue of 10YR, value of 2 to 5, and chroma of 1 or 2. It is 4 to 9 inches thick.

The E horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 2 to 4. Few to common yellow, brown, or gray mottles are in some pedons. This horizon is 50 to 70 inches thick.

The Bh horizon has hue of 10YR, 7.5YR, or 5YR, value of 2 or 3, and chroma of 3 or less. Where the color is black, this horizon generally is less than 8 inches thick.

Formation of the Soils

In this section, the factors and processes of soil formation are described and related to the soils in Polk County.

Factors of Soil Formation

Soil is produced by forces of weathering acting on the parent material that has been deposited or accumulated by geologic agencies. The kind of soil that develops depends on five major factors. These factors are the climate under which soil material has existed since accumulation; the plant and animal life in and on the soil; the type of parent material; the relief, or lay of the land; and the length of time that the forces of soil formation have acted on the soil material.

The five soil-forming factors are interdependent; each modifies the effect of the others. Any one of the five factors can have more influence than the others on the formation of a soil and can account for most of its properties. For example, if the parent material is quartz sand, the soil generally has weakly expressed horizons. In some places, the effect of the parent material is modified greatly by the effects of climate, relief, and plants and animals in and on the soil. As a soil forms, it is influenced by more than one of the five factors, but in some places one factor has a predominant effect. A modification or variation in any of these factors results in a different kind of soil.

Parent Material

Parent material is the unconsolidated mass from which a soil is formed. It determines the limits of the chemical and mineralogical composition of the soil. All of the soils in Polk County formed in sediments that are underlain and influenced by the Ocala and Hawthorn geologic groups.

The sediments that cover most of Polk County range in age from Pliocene to Pleistocene *(13)*. The flood plains, swamps, and marshes are of Holocene age. These sediments are sand, silt, clay, and organic material. Generally, these sediments are thinnest in the southwest part of the county and thickest in the northern and eastern parts and beneath the ridges. The thickness ranges from less than 10 feet to more than 120 feet. Many differences among soils in the county reflect differences in the parent materials.

The characteristics, distribution, and depositional sequence of the parent materials are more thoroughly discussed in the section "Geology."

Climate

Polk County has a subtropical climate. The extreme temperatures are moderated by the many lakes; however, these bodies of water contribute to the high humidity of the area. The average rainfall is about 55 inches per year. In summer, the climate is uniform throughout the county.

Few differences among the soils are caused by the climate; however, climate aids in rapid decomposition of organic matter and hastens chemical reactions in the soil. The heavy rainfall leaches the soils of most plant nutrients and produces a strongly acid condition in many of the sandy soils. Rain also carries the less soluble fine particles downward. Because of these climatic conditions, many soils are sandy and have low content of organic matter, low natural fertility, and low available water capacity.

Plants and Animals

Plants have been the principal biological factor in the formation of soils in the county. Animals, insects, bacteria, and fungi have also been important agents. Plant and animal life furnish organic matter to the soil and bring plant nutrients from the lower layers of the soil to the upper layers. In places, plants and animals cause differences in the content of organic matter, nitrogen, and plant nutrients in the soil and differences in soil structure and porosity. For example, tree roots and crawfish have penetrated into the loamy subsoil and mixed the sandy surface layer with the subsoil.

Micro-organisms, including bacteria and fungi, weather and break down minerals and decompose

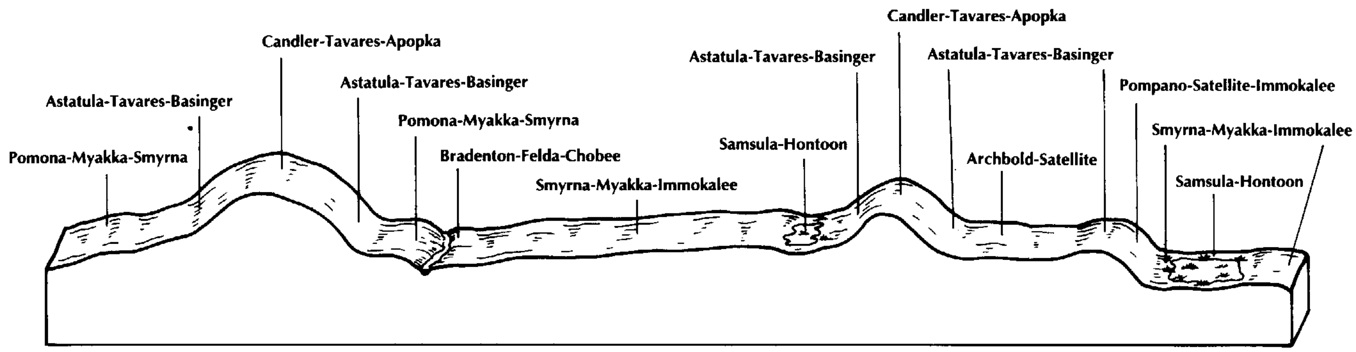


Figure 10.—Relationship of soils to topography.

organic matter. These organisms are most numerous in the upper few inches of the soil. Earthworms and other small animals inhabit the soil, alter its chemical composition, and mix it with other soil material. However, the native vegetation in the county has affected soil formation more than other living organisms.

Man has influenced the formation of the soils by clearing the forests, cultivating the soils, draining wet areas, and introducing different kinds of plants. The complex of living organisms that affect soil formation has been drastically changed because of man's activities; nevertheless, these activities have had little effect on the soils except for loss of organic matter.

Relief

Relief has affected the formation of soils in Polk County mainly through its influence on soil and water relationships (fig. 10). Other factors of soil formation generally associated with relief, such as erosion, temperature, and plant cover, are of minor importance.

The county is made up of flatwoods, swamps and marshes, and sand ridges. Differences among the soils in these areas are directly related to relief.

The soils on flatwoods have a high water table and are periodically wet to the surface; therefore, they are not so highly leached as the soils on the sand ridges. The soils in the swamps and marshes are covered with water for long periods. In many places, they have a high content of organic matter. The soils on the sand ridges are at a higher elevation than the soils on flatwoods and in swamps and marshes. Because these deep, sandy soils are mostly excessively drained, they are not influenced by a ground water table. These soils, however, are more subject to erosion than soils in other parts of the county.

Time

Time is an important factor in soil formation. The physical and chemical changes brought about by climate, plants and animals, and relief are slow. The length of time needed to convert raw geologic material into soil varies according to the nature of the geologic material and the interaction of the other factors. Some basic minerals from which soils are formed weather fairly rapidly; other minerals are chemically inert and show little change over long periods. The translocation of fine particles in the soil to form horizons varies under different conditions, but the processes always take a relatively long period.

In Polk County, the dominant geologic materials are inactive. The sand is almost pure quartz and is highly resistant to weathering. The fine textured silt and clay are the products of earlier weathering.

Relatively little geologic time has elapsed since the material in which the soils have developed was laid down or emerged from the sea. The loamy and clayey horizons formed in place through processes of clay translocation.

Processes of Soil Formation

Soil morphology refers to that process which involves the formation of the soil horizon or soil horizon differentiation. The differentiation of horizons in soils in Polk County is the result of accumulation of organic matter, leaching of carbonates, reduction and transfer of iron, or accumulation of silicate clay minerals. Sometimes, more than one of these processes is involved.

Some organic matter has accumulated in the upper layers of most of the soils to form an A horizon. The content of organic matter is low in some of the soils and fairly high in others.

Carbonates and salts have been leached in all of the soils. Because the leaching permitted the subsequent translocation of silicate clay materials in some soils, the effects of leaching have been indirect. Most of the soils are leached to varying degrees.

The process of chemical reduction, or gleying, is evident in many of the soils except in excessively drained and well drained soils. Gleying is caused by wetness. The gray matrix in the B horizon in many soils and the grayish mottles in other soils indicate the reduction of iron. In some sandy soils, however, gray is the color of the sand grains. In some horizons, reddish brown mottles and concretions indicate the segregation of iron and fluctuating water table.

The translocation of silicate clay, colloidal organic matter, and iron oxides has contributed to horizon development in many of the soils. The movement of clay, organic matter, or iron is evident in many of the soils; for example, in a light colored, leached E horizon; in a Bt or Bh horizon in which sand grains are bridged and coated with clay or colloidal organic matter; or in a few patchy clay films on ped faces and in root channels. Other processes of soil formation, however, are less important in the formation of horizons in the soils of Polk County than the translocation of silicate clay.

The soil-forming processes have resulted in a succession of layers, or horizons, in the soil from the surface downward. These horizons can differ from one another in one property or more, such as color, texture, structure, consistence, or reaction. They also can be thick or thin. The horizons can be the result of the activity of soil-forming processes at different periods.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep rocky slopes.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

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.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

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.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, such as fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay are in the soil. The soil is not a source of gravel or sand for construction purposes.

Fast intake (in tables). The 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.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant that is not a grass or a sedge.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric and the more decomposed sapric material.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual*. The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is, in part, a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as accumulation of clay, sesquioxides, humus, or a combination of these; prismatic or blocky structure; redder or browner colors than those in the A horizon; or a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Arabic numeral 2 precedes the letter C.

R layer.—Consolidated rock (unweathered bedrock) beneath the soil. The rock commonly underlies a C horizon but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the plants that are the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material. This contrasts with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake in inches per hour is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low

0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, invader plants follow disturbance of the surface.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Lamellae. Thin layering or stratification in some sandy textured soils. Individual layers typically are less than 1 inch thick and contain more clay particles than the overlying and underlying layers.

Large stones (in tables). Rock fragments that are 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

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. Coarse sandy loam, 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.

Mounding. To heap and shape fill material, generally sandy material, to elevate construction sites and sites for septic tank absorption fields. This practice is common in wet areas.

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 through the profile. Permeability is measured as the number of inches per hour that water moves through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitting (in tables). Pits caused by melting ground ice. They form on the soil after plant cover is removed.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

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.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Rangeland. Land on which the potential climax vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Range condition. The present composition of the plant community on a range site in relation to the potential climax plant community for that site. Range condition is expressed as excellent, good, fair, or poor, on the basis of how much the present plant community has departed from the potential.

Range site. An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct climax plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

Reaction, soil. A measure of the acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are—

Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Rill. A steep-sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rippable. Bedrock or hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 draw bar horsepower rating.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized 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 adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio. The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Sinkhole. A depression on the landscape where limestone has been dissolved.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in organic matter content than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace. An embankment, or ridge, constructed 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."

Thin layer (in tables). An otherwise suitable soil material that is too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, such as zinc, cobalt, manganese, copper, and iron, are in soils in extremely small amounts. They are essential to plant growth.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Weathering. All physical and chemical changes produced by atmospheric agents in rocks or other deposits at or near the earth's surface. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Data recorded in the period 1951-84 at Bartow, Florida]

Month	Temperature						Precipitation			
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more
	°F	°F	°F	°F	°F	Units	In	In	In	In
January--	73.1	48.5	60.8	85	26	355	2.41	0.74	3.75	4
February-	74.7	49.9	62.3	87	30	357	3.46	1.66	4.99	5
March----	80.0	54.9	67.5	91	34	543	3.40	1.12	5.26	5
April----	84.9	59.8	72.4	93	43	672	2.52	.58	3.82	4
May------	89.4	65.1	77.3	97	52	846	5.12	1.28	7.85	6
June-----	91.6	70.0	80.8	98	61	924	7.13	4.14	9.65	10
July-----	92.6	71.5	82.1	98	66	995	8.46	5.65	10.88	12
August---	92.6	71.8	82.2	97	67	998	7.52	5.26	9.27	13
September	90.4	70.6	80.5	96	63	915	6.75	3.43	9.35	10
October--	85.5	63.9	74.7	94	45	766	2.76	.77	4.17	5
November-	78.9	56.1	67.5	88	35	525	2.11	.47	3.40	4
December-	74.0	50.3	62.2	85	27	385	2.27	.74	3.51	4
Yearly:										
Average-	84.0	61.0	72.5	---	---	---	---	---	---	---
Extreme-	---	---	---	99	24	---	---	---	---	---
Total---	---	---	---	---	---	8,281	53.91	45.32	63.26	82

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Data recorded in the period 1951-84 at Bartow, Florida]

Probability	Temperature		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than---	Jan. 23	Feb. 10	Mar. 3
2 years in 10 later than---	Dec. 30	Jan. 27	Feb. 19
5 years in 10 later than---	*	Dec. 12	Jan. 28
First freezing temperature in fall:			
1 year in 10 earlier than-	Dec. 28	Dec. 12	Nov. 27
2 years in 10 earlier than-	Jan. 18	Dec. 27	Dec. 7
5 years in 10 earlier than-	*	Feb. 10	Dec. 25

* Probability of occurrence of threshold temperature is less than indicated probability.

TABLE 3.--GROWING SEASON

[Data recorded in the period 1951-84 at Bartow, Florida. The symbol > means more than]

Probability	Daily minimum temperature during growing season		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	>365	324	289
8 years in 10	>365	356	300
5 years in 10	>365	>365	325
2 years in 10	>365	>365	>365
1 year in 10	>365	>365	>365

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
2	Apopka fine sand, 0 to 5 percent slopes	18,841	1.6
3	Candler sand, 0 to 5 percent slopes	88,487	7.6
4	Candler sand, 5 to 8 percent slopes	2,728	0.2
5	EauGallie fine sand	9,239	0.8
6	Eaton mucky fine sand, depressional	9,456	0.8
7	Pomona fine sand	85,401	7.3
8	Hydraquents, clayey	49,248	4.2
9	Lynne sand	4,921	0.4
10	Malabar fine sand	12,107	1.0
11	Arents-Water complex	42,789	3.7
12	Neilhurst sand, 1 to 5 percent slopes	23,793	2.0
13	Samsula muck	52,639	4.5
14	Sparr sand, 0 to 5 percent slopes	19,820	1.7
15	Tavares fine sand, 0 to 5 percent slopes	50,446	4.3
16	Urban land	7,844	0.7
17	Smyrna and Myakka fine sands	150,319	13.0
19	Floridana mucky fine sand, depressional	18,477	1.6
20	Fort Meade sand, 0 to 5 percent slopes	5,969	0.5
21	Immokalee sand	28,955	2.5
22	Pomello fine sand	10,288	0.9
23	Ona fine sand	11,674	1.0
24	Nittaw sandy clay loam, frequently flooded	13,674	1.2
25	Placid and Myakka fine sands, depressional	20,511	1.7
26	Lochloosa fine sand	2,942	0.2
27	Kendrick fine sand, 0 to 5 percent slopes	3,531	0.3
29	St. Lucie fine sand, 0 to 5 percent slopes	2,849	0.2
30	Pompano fine sand	10,230	0.9
31	Adamsville fine sand	16,123	1.4
32	Kaliga muck	25,773	2.2
33	Holopaw fine sand, depressional	10,932	0.9
34	Anclote mucky fine sand, depressional	1,955	0.2
35	Hontoon muck	50,223	4.3
36	Basinger mucky fine sand, depressional	22,302	1.9
37	Placid fine sand, frequently flooded	850	*
38	Electra fine sand	584	*
39	Arents, clayey substratum	3,382	0.3
40	Wauchula fine sand	18,724	1.6
41	St. Johns sand	2,022	0.2
42	Felda fine sand	11,294	1.0
43	Oldsmar fine sand	8,661	0.7
44	Paisley fine sand	3,486	0.3
46	Astatula sand, 0 to 8 percent slopes	41,553	3.6
47	Zolfo fine sand	9,403	0.8
48	Chobee fine sandy loam, depressional	1,081	*
49	Adamsville-Urban land complex	1,459	0.1
50	Candler-Urban land complex, 0 to 5 percent slopes	7,581	0.6
51	Pomona-Urban land complex	1,080	*
53	Myakka-Immokalee-Urban land complex	3,345	0.3
54	Pomello-Urban land complex	1,452	0.1
55	Sparr-Urban land complex, 0 to 5 percent slopes	2,973	0.2
57	Haplaquents, clayey	7,522	0.6
58	Udorthents, excavated	2,820	0.2
59	Arents-Urban land complex, 0 to 5 percent slopes	3,152	0.3
60	Arents, sandy	875	*
61	Arents, organic substratum-Urban land complex	828	*
62	Wabasso fine sand	7,729	0.7
63	Tavares-Urban land complex, 0 to 5 percent slopes	4,586	0.4
64	Neilhurst-Urban land complex, 1 to 5 percent slopes	1,106	0.1
66	Fort Meade-Urban land complex, 0 to 5 percent slopes	2,575	0.2
67	Bradenton fine sand	6,393	0.6

See footnotes at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
68	Arents, 0 to 5 percent slopes	31,897	2.7
70	Duette fine sand	5,556	0.6
72	Bradenton-Felda-Chobee association, frequently flooded	2,948	0.2
73	Gypsum land	3,803	0.3
74	Narcoossee sand	7,824	0.7
75	Valkaria sand	5,890	0.5
76	Millhopper fine sand, 0 to 5 percent slopes	3,914	0.3
77	Satellite sand	6,101	0.5
78	Paisley fine sand, stony subsurface	1,107	*
80	Chobee fine sandy loam, frequently flooded	1,257	0.1
81	St. Augustine sand	1,170	0.1
82	Felda fine sand, frequently flooded	5,455	0.5
83	Archbold sand, 0 to 5 percent slopes	8,988	0.8
85	Winder fine sand, depressional	2,946	0.2
86	Felda fine sand, depressional	12,441	1.1
87	Basinger fine sand	19,834	1.7
	Water areas less than 40 acres in size	4,670	0.4
	Total**	1,166,803	100.0

* Less than 0.1 percent.
** Does not include 119,808 acres of lakes that are more than 40 acres in size.

TABLE 5.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Map symbol and soil name	Land capability	Oranges	Grapefruit	Watermelons	Cucumbers	Bahiagrass	Grass-clover
		Boxes	Boxes	Tons	Tons	AUM*	AUM*
2---------------- Apopka	IIIs	500	700	20.0	---	8.0	---
3---------------- Candler	IVs	425	625	10.0	---	7.0	---
4---------------- Candler	VIs	400	600	---	---	6.5	---
5---------------- EauGallie	IVw	375	575	---	---	8.0	12.0
6---------------- Eaton	VIIw	---	---	---	---	---	---
7---------------- Pomona	IVw	---	---	9.5	8.0	8.0	10.0
8. Hydraquents							
9---------------- Lynne	IIIw	---	---	10.0	---	9.0	12.0
10--------------- Malabar	IVw	325	575	---	6.0	8.0	12.0
11. Arents-Water							
12--------------- Neilhurst	VIs	---	---	---	---	3.5	---
13--------------- Samsula	VIIw	---	---	---	---	---	---
14--------------- Sparr	IIIw	415	615	10.0	---	9.0	---
15--------------- Tavares	IIIs	425	600	8.0	---	8.0	---
16. Urban land							
17--------------- Smyrna and Myakka	IVw	350	550	---	---	9.0	12.0
19--------------- Floridana	VIIw	---	---	---	---	---	---
20--------------- Fort Meade	IIIs	600	750	10.0	---	9.0	---
21--------------- Immokalee	IVw	350	550	---	---	7.5	10.0

See footnote at end of table.

TABLE 5.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Oranges	Grapefruit	Watermelons	Cucumbers	Bahiagrass	Grass-clover
		Boxes	Boxes	Tons	Tons	AUM*	AUM*
22--------------- Pomello	VIs	250	400	---	---	3.5	---
23--------------- Ona	IIIw	350	550	---	6	8.5	12.0
24--------------- Nittaw	Vw	---	---	---	---	---	---
25--------------- Placid and Myakka	VIIw	---	---	---	---	---	---
26--------------- Lochloosa	IIw	475	675	11	---	10.0	---
27--------------- Kendrick	IIe	525	725	---	---	10.0	---
29--------------- St. Lucie	VIIs	---	---	---	---	---	---
30--------------- Pompano	IVw	300	400	---	---	8.0	10.0
31--------------- Adamsville	IIIw	375	500	---	---	7.0	10.0
32--------------- Kaliga	VIIw	---	---	---	---	---	---
33--------------- Holopaw	VIIw	---	---	---	---	---	---
34--------------- Anclote	VIIw	---	---	---	---	---	---
35--------------- Hontoon	VIIw	---	---	---	---	---	---
36--------------- Basinger	VIIw	---	---	---	---	---	---
37--------------- Placid	VIw	---	---	---	---	---	---
38--------------- Electra	VIs	275	400	---	---	6.0	---
39. Arents							
40--------------- Wauchula	IIIw	400	575	---	---	10.0	12.0
41--------------- St. Johns	IIIw	300	550	---	---	8.5	12.0
42--------------- Felda	IIIw	425	625	---	---	7.5	10.5

See footnote at end of table.

TABLE 5.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Oranges	Grapefruit	Watermelons	Cucumbers	Bahiagrass	Grass-clover
		Boxes	Boxes	Tons	Tons	AUM*	AUM*
43--------------- Oldsmar	IVw	325	525	---	6.0	9.0	10.0
44--------------- Paisley	IIIw	---	---	---	---	10.0	12.0
46--------------- Astatula	VIs	400	525	10.0	---	5.5	---
47--------------- Zolfo	IIIw	375	500	---	---	7.0	---
48--------------- Chobee	VIIw	---	---	---	---	---	---
49. Adamsville- Urban land							
50. Candler-Urban land							
51. Pomona-Urban land							
53. Myakka- Immokalee- Urban land							
54. Pomello-Urban land							
55. Sparr-Urban land							
57--------------- Haplaquents	VIIw	---	---	---	---	---	---
58. Udorthents							
59. Arents-Urban land							
60. Arents							
61. Arents-Urban land							
62--------------- Wabasso	IIIw	400	575	---	---	8.0	12.0

See footnote at end of table.

TABLE 5.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Oranges	Grapefruit	Watermelons	Cucumbers	Bahiagrass	Grass-clover
		Boxes	Boxes	Tons	Tons	AUM*	AUM*
63. Tavares-Urban land							
64. Neilhurst-Urban land							
66. Fort Meade-Urban land							
67-------------- Bradenton	IIIw	450	550	---	---	9.0	12.0
68. Arents							
70-------------- Duette	VIs	---	---	---	---	5.0	---
72:							
Bradenton-------	Vw	---	---	---	---	---	---
Felda-----------	Vw	---	---	---	---	---	---
Chobee----------	Vw	---	---	---	---	---	---
73. Gypsum land							
74-------------- Narcoossee	IIIw	350	450	---	---	6.0	---
75-------------- Valkaria	IVw	350	450	---	---	7.5	10.0
76-------------- Millhopper	IIIs	450	650	10.0	---	8.5	---
77-------------- Satellite	VIs	---	---	5.0	---	5.0	---
78-------------- Paisley	IIIw	---	---	---	---	---	---
80-------------- Chobee	Vw	---	---	---	---	---	---
81-------------- St. Augustine	VIIs	---	---	---	---	---	---
82-------------- Felda	Vw	---	---	---	---	---	---
83-------------- Archbold	VIs	400	525	---	---	5.5	---
85-------------- Winder	VIIw	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Oranges	Grapefruit	Watermelons	Cucumbers	Bahiagrass	Grass-clover
		Boxes	Boxes	Tons	Tons	AUM*	AUM*
86--------------- Felda	VIIw	---	---	---	---	---	---
87--------------- Basinger	IVw	350	450	---	---	8.0	12.0

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

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 problems (s)
		Acres	Acres	Acres
I	---	---	---	---
II	6,473	3,531	2,942	---
III	199,690	---	120,520	79,170
IV	419,123	---	330,636	88,487
V	23,334	---	23,334	---
VI	100,441	---	850	99,591
VII	240,277	---	236,258	4,019
VIII	---	---	---	---

TABLE 7.--RANGELAND PRODUCTIVITY

[Only the soils that support rangeland vegetation suitable for grazing are listed]

Map symbol and soil name	Range site	Potential annual production for kind of growing season		
		Favorable	Average	Unfavorable
		Lb/acre	Lb/acre	Lb/acre
2 Apopka	Longleaf Pine-Turkey Oak Hills	4,000	3,000	2,000
3, 4 Candler	Longleaf Pine-Turkey Oak Hills	4,000	3,000	2,000
5 EauGallie	South Florida Flatwoods	6,000	4,500	3,000
6 Eaton	Freshwater Marshes and Ponds	10,000	7,500	5,000
7 Pomona	South Florida Flatwoods	6,000	4,500	3,000
9 Lynne	South Florida Flatwoods	6,000	4,500	3,000
10 Malabar	Slough	8,000	6,000	4,000
13 Samsula	Freshwater Marshes and Ponds	10,000	7,500	5,000
14 Sparr	Oak Hammock	3,500	2,500	2,000
15 Tavares	Longleaf Pine-Turkey Oak Hills	4,000	3,000	2,000
17 Smyrna-Myakka	South Florida Flatwoods	6,000	4,500	2,000
19 Floridana	Freshwater Marshes and Ponds	10,000	7,500	5,000
20 Fort Meade	Upland Hardwood Hammock	4,500	3,500	3,000
21 Immokalee	South Florida Flatwoods	6,000	4,500	3,000
22 Pomello	Sand Pine Scrub	3,500	2,500	1,500
23 Ona	South Florida Flatwoods	6,000	4,500	3,000
25 Placid-Myakka	Freshwater Marshes and Ponds	10,000	7,500	5,000
26 Lochloosa	Oak Hammock	3,500	2,500	2,000
27 Kendrick	Upland Hardwood Hammock	4,500	3,500	3,000

TABLE 7.--RANGELAND PRODUCTIVITY--Continued

Map symbol and soil name	Range site	Potential annual production for kind of growing season		
		Favorable	Average	Unfavorable
		Lb/acre	Lb/acre	Lb/acre
29: St. Lucie	Sand Pine Scrub	3,500	2,500	1,500
30: Pompano	Slough	8,000	6,000	4,000
31: Adamsville	South Florida Flatwoods	6,000	4,500	3,000
32: Kaliga	Freshwater Marshes and Ponds	10,000	7,500	5,000
33: Holopaw	Freshwater Marshes and Ponds	10,000	7,500	5,000
34: Anclote	Freshwater Marshes and Ponds	10,000	7,500	5,000
35: Hontoon	Freshwater Marshes and Ponds	10,000	7,500	5,000
36: Basinger	Freshwater Marshes and Ponds	10,000	7,500	5,000
38: Electra	Sand Pine Scrub	3,500	2,500	1,500
40: Wauchula	South Florida Flatwoods	6,000	4,000	3,000
41: St. Johns	Cutthroat Seep	9,000	6,000	4,500
42: Felda	Slough	8,000	6,000	4,000
43: Oldsmar	South Florida Flatwoods	6,000	4,000	3,000
44: Paisley	South Florida Flatwoods	6,000	4,000	3,000
46: Astatula	Longleaf Pine-Turkey Oak Hills	4,000	3,000	2,000
48: Chobee	Freshwater Marshes and Ponds	10,000	7,500	5,000
62: Wabasso	South Florida Flatwoods	6,000	4,500	3,000
67: Bradenton	Oak Hammmock	3,500	2,500	2,000
70: Duette	Sand Pine Scrub	3,500	2,500	1,500
74: Narcoossee	Oak Hammock	3,500	2,500	2,000

TABLE 7.--RANGELAND PRODUCTIVITY--Continued

Map symbol and soil name	Range site	Potential annual production for kind of growing season		
		Favorable	Average	Unfavorable
		Lb/acre	Lb/acre	Lb/acre
75: Valkaria	Slough	8,000	6,000	4,000
76: Millhopper	Oak Hammock	3,500	2,500	2,000
77: Satellite	Sand Pine Scrub	3,500	2,500	1,500
78: Paisley	South Florida Flatwoods	6,000	4,500	3,000
83: Archbold	Sand Pine Scrub	3,500	2,500	1,500
85: Winder	Freshwater Marshes and Ponds	10,000	7,500	5,000
86: Felda	Freshwater Marshes and Ponds	10,000	7,500	5,000
87: Basinger	Slough	8,000	6,000	4,000

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Productivity class*	
2----------------- Apopka	10S	Slight	Moderate	Moderate	Slight	Slight	Slash pine---------- South Florida slash pine---------------- Longleaf pine------- Turkey oak---------- Bluejack oak-------- Post oak------------ Live oak------------	80 45 70 --- --- --- ---	10 4 6 --- --- --- ---	Slash pine, longleaf pine, South Florida slash pine.
3, 4--------------- Candler	8S	Slight	Moderate	Moderate	Slight	Moderate	Slash pine---------- South Florida slash pine---------------- Longleaf pine------- Turkey oak---------- Post oak------------ Live oak------------	70 35 60 --- --- ---	8 3 4 --- --- ---	Sand pine, slash pine, South Florida slash pine, longleaf pine.
5----------------- EauGallie	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine---------- Longleaf pine------- South Florida slash pine---------------- Cabbage palm--------	80 70 45 ---	10 6 4 ---	Slash pine, South Florida slash pine.
6----------------- Eaton	3W	Slight	Severe	Severe	Moderate	Severe	Pondcypress--------- Baldcypress--------- Blackgum------------ Cabbage palm-------- Carolina ash-------- Loblollybay gordonia Red maple----------- Sweetbay------------	75 --- --- --- --- --- --- ---	3 --- --- --- --- --- --- ---	**
7----------------- Pomona	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine---------- Longleaf pine------- South Florida slash pine----------------	80 70 70 45	10 6 6 ---	Slash pine, South Florida slash pine.
9----------------- Lynne	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine---------- Longleaf pine------- South Florida slash pine----------------	80 70 45	10 6 4	Slash pine, South Florida slash pine.

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	Trees to plant
10 Malabar	10W	Slight	Moderate	Severe	Slight	Moderate	Slash pine	80	10	Slash pine, South Florida slash pine.
							Longleaf pine	70	6	
							South Florida slash pine	45	4	
							Cabbage palm	---	---	
							Live oak	---	---	
							Water oak	---	---	
							Laurel oak	---	---	
							Cypress	---	---	
12 Neilhurst	8S	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	70	8	Slash pine, South Florida slash pine, longleaf pine.
							Longleaf pine	60	4	
13 Samsula	2W	Slight	Severe	Severe	Moderate	Severe	Pondcypress	75	2	**
							Sweetbay	---	---	
							Red maple	---	---	
							Baldcypress	---	---	
							Blackgum	---	---	
							Carolina ash	---	---	
							Loblollybay gordonia	---	---	
14 Sparr	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	80	10	Slash pine, South Florida slash pine.
							South Florida slash pine	45	4	
							Longleaf pine	70	6	
							Laurel oak	---	---	
							Water oak	---	---	
							Live oak	---	---	
							Magnolia	---	---	
							Hickory	---	---	
15 Tavares	10S	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	80	10	Slash pine, South Florida slash pine, longleaf pine.
							Longleaf pine	70	6	
							South Florida slash pine	45	4	
							Turkey oak	---	---	
							Bluejack oak	---	---	
							Post oak	---	---	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	Trees to plant
17:										
Smyrna	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	80	10	Slash pine, South Florida slash pine.
							Longleaf pine	70	6	
							South Florida slash pine	45	4	
Myakka	8W	Slight	Moderate	Moderate	Moderate	Moderate	Slash pine	70	8	Slash pine, South Florida slash pine.
							Longleaf pine	60	4	
							South Florida slash pine	35	3	
							Live oak	---	---	
							Water oak	---	---	
19 Floridana	2W	Slight	Severe	Severe	Slight	Severe	Pondcypress	75	2	**
							Baldcypress	---	---	
							Blackgum	---	---	
							Cabbage palm	---	---	
							Carolina ash	---	---	
							Loblollybay gordonia	---	---	
							Red maple	---	---	
							Sweetbay	---	---	
20 Fort Meade	10S	Slight	Slight	Slight	Slight	Moderate	Slash pine	80	10	Slash pine, South Florida slash pine, longleaf pine.
							South Florida slash pine	45	4	
							Longleaf pine	---	---	
							Live oak	---	---	
							Laurel oak	---	---	
21 Immokalee	8W	Slight	Moderate	Moderate	Moderate	Moderate	Slash pine	70	8	Slash pine, South Florida slash pine.
							Longleaf pine	65	5	
							South Florida slash pine	35	3	
22 Pomello	8S	Slight	Moderate	Severe	Moderate	Moderate	Slash pine	70	8	Slash pine, South Florida slash pine, longleaf pine.
							Longleaf pine	60	4	
							Sand pine	60	3	
							South Florida slash pine	35	3	
							Live oak	---	---	
23 Ona	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	80	10	Slash pine, South Florida slash pine.
							Longleaf pine	70	6	
							South Florida slash pine	45	4	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Productivity class*	
24: Nittaw	6W	Slight	Severe	Severe	Moderate	Severe	Baldcypress	100	6	**
							Sweetgum	---	---	
							Cabbage palm	---	---	
							Red maple	---	---	
							Laurel oak	---	---	
							Water oak	---	---	
							Sugarberry	---	---	
25: Placid-Myakka	2W	Slight	Severe	Severe	Moderate	Severe	Pondcypress	75	2	**
							Baldcypress	---	---	
							Blackgum	---	---	
							Sweetbay	---	---	
							Loblollybay gordonia	---	---	
							Red maple	---	---	
26: Lochloosa	11A	Slight	Slight	Slight	Slight	Slight	Slash pine	90	11	Slash pine, South Florida slash pine.
							South Florida slash pine	45	4	
							Hickory	---	---	
							Live oak	---	---	
							Laurel oak	---	---	
							Water oak	---	---	
							Magnolia	---	---	
							Sweetgum	---	---	
27: Kendrick	11S	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	90	11	Slash pine, South Florida slash pine.
							South Florida slash pine	45	4	
							Longleaf pine	75	6	
							Live oak	---	---	
							Hickory	---	---	
							Magnolia	---	---	
							Laurel oak	---	---	
29: St. Lucie	3S	Slight	Severe	Moderate	Slight	Slight	Sand pine	60	3	Sand pine.
							Sand live oak	---	---	
							Chapman oak	---	---	
							Myrtle oak	---	---	
30: Pompano	8W	Slight	Severe	Severe	Slight	Moderate	Slash pine	70	8	Slash pine, South Florida slash pine.
							South Florida slash pine	45	4	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Productivity class*	
31----------------- Adamsville	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----------	80	10	Slash pine, South Florida slash pine, longleaf pine.
							Longleaf pine-------	65	5	
							Laurel oak----------	---	---	
							Water oak-----------	---	---	
							Live oak------------	---	---	
32----------------- Kaliga	2W	Slight	Severe	Severe	Moderate	Severe	Pondcypress---------	75	2	**
							Sweetbay------------	---	---	
							Red maple-----------	---	---	
							Baldcypress---------	---	---	
							Blackgum------------	---	---	
							Carolina ash--------	---	---	
							Loblollybay gordonia	---	---	
33----------------- Holopaw	2W	Slight	Severe	Severe	Moderate	Severe	Pondcypress---------	75	2	**
							Baldcypress---------	---	---	
							Blackgum------------	---	---	
							Cabbage palm--------	---	---	
							Carolina ash--------	---	---	
							Loblollybay gordonia	---	---	
							Red maple-----------	---	---	
							Sweetbay------------	---	---	
34----------------- Anclote	2W	Slight	Severe	Severe	Moderate	Severe	Pondcypress---------	75	2	**
							Baldcypress---------	---	---	
							Blackgum------------	---	---	
							Cabbage palm--------	---	---	
							Carolina ash--------	---	---	
							Loblollybay gordonia	---	---	
							Red maple-----------	---	---	
							Sweetbay------------	---	---	
35----------------- Hontoon	6W	Slight	Severe	Severe	Severe	Severe	Baldcypress---------	100	6	**
							Blackgum------------	---	---	
							Loblollybay gordonia	---	---	
							Red maple-----------	---	---	
							Sweetbay------------	---	---	
							Pondcypress---------	---	---	
36----------------- Basinger	2W	Slight	Severe	Severe	Moderate	Severe	Pondcypress---------	75	2	**
							Baldcypress---------	---	---	
							Blackgum------------	---	---	
							Cabbage palm--------	---	---	
							Carolina ash--------	---	---	
							Loblollybay gordonia	---	---	
							Red maple-----------	---	---	
							Sweetbay------------	---	---	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
37----------------- Placid	6W	Slight	Severe	Severe	Moderate	Moderate	Baldcypress---------	100	6	**
							Sweetgum------------	---	---	
							Water oak-----------	---	---	
							Laurel oak----------	---	---	
							Red maple-----------	---	---	
							Pondcypress---------	---	---	
38----------------- Electra	8S	Slight	Moderate	Severe	Slight	Slight	Slash pine----------	70	8	Slash pine, South Florida slash pine.
							Sand pine-----------	65	3	
							Longleaf pine-------	65	5	
							South Florida slash pine---------------	35	3	
							Sand live oak-------	---	---	
40----------------- Wauchula	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----------	80	10	Slash pine, South Florida slash pine.
							Longleaf pine-------	65	5	
							South Florida slash pine---------------	45	---	
41----------------- St. Johns	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----------	80	10	Slash pine, South Florida slash pine.
							Longleaf pine-------	70	6	
							South Florida slash pine---------------	45	4	
42----------------- Felda	10W	Slight	Moderate	Severe	Slight	Moderate	Slash pine----------	80	10	Slash pine, South Florida slash pine.
							South Florida slash pine---------------	45	4	
							Live oak------------	---	---	
							Laurel oak----------	---	---	
43----------------- Oldsmar	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----------	80	10	Slash pine, South Florida slash pine.
							Longleaf pine-------	65	5	
							South Florida slash pine---------------	45	4	
							Cabbage palm--------	---	---	
44----------------- Paisley	13W	Slight	Severe	Severe	Severe	Severe	Slash pine----------	100	13	Slash pine.
							South Florida slash pine---------------	45	4	
							Live oak------------	---	---	
							Cabbage palm--------	---	---	
							Sweetgum------------	---	---	
46----------------- Astatula	3S	Slight	Severe	Moderate	Slight	Slight	Sand pine-----------	60	3	Sand pine.
							Longleaf pine-------	57	3	
							Turkey oak----------	---	---	
							Bluejack oak--------	---	---	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Productivity class*	
47 Zolfo	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	80	10	Slash pine, South Florida slash pine.
							Longleaf pine	65	5	
							South Florida slash pine	45	4	
							Turkey oak	---	---	
							Laurel oak	---	---	
							Water oak	---	---	
48 Chobee	2W	Slight	Severe	Severe	Moderate	Severe	Pondcypress	75	2	**
							Baldcypress	---	---	
							Blackgum	---	---	
							Cabbage palm	---	---	
							Carolina ash	---	---	
							Loblollybay gordonia	---	---	
							Red maple	---	---	
							Sweetbay	---	---	
52 Wabasso	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	80	10	Slash pine, South Florida slash pine.
							South Florida slash pine	45	4	
							Longleaf pine	65	5	
							Live oak	---	---	
							Water oak	---	---	
							Cabbage palm	---	---	
57 Bradenton	11W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	90	11	Slash pine, South Florida slash pine.
							Longleaf pine	75	6	
							South Florida slash pine	70	---	
							Live oak	---	---	
							Cabbage palm	---	---	
							Water oak	---	---	
							Laurel oak	---	---	
70 Duette	6S	Slight	Moderate	Severe	Slight	Slight	Slash pine	55	6	Slash pine, South Florida slash pine.
							Sand pine	45	2	
							Sand live oak	---	---	
							Myrtle oak	---	---	
							Chapman oak	---	---	
							Turkey oak	---	---	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	Trees to plant
72:										
Bradenton	11W	Slight	Severe	Severe	Slight	Moderate	Slash pine	90	11	Slash pine, South Florida slash pine.
							Longleaf pine	75	6	
							South Florida slash pine	70	13	
							Cabbage palm	---	---	
							Sweetgum	---	---	
							Water oak	---	---	
							Laurel oak	---	---	
Felda	10W	Slight	Moderate	Severe	Slight	Moderate	Slash pine	80	10	Slash pine, South Florida slash pine.
							Longleaf pine	65	5	
							South Florida slash pine	45	4	
Chobee	6W	Slight	Severe	Moderate	Slight	Severe	Baldcypress	100	6	
							Red maple	---	---	
							Blackgum	---	---	
							Sweetbay	---	---	
74 Narcoossee	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	80	10	Slash pine, South Florida slash pine, longleaf pine.
							Longleaf pine	70	6	
							South Florida slash pine	45	4	
							Cabbage palm	---	---	
							Water oak	---	---	
							Live oak	---	---	
							Laurel oak	---	---	
75 Valkaria	8W	Slight	Severe	Moderate	Slight	Moderate	Slash pine	70	8	Slash pine, South Florida slash pine.
							Longleaf pine	60	4	
							South Florida slash pine	35	3	
							Live oak	---	---	
							Water oak	---	---	
							Laurel oak	---	---	
76 Millhopper	10S	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	80	10	Slash pine, South Florida slash pine, longleaf pine.
							Longleaf pine	65	5	
							Live oak	---	---	
							Laurel oak	---	---	
77 Satellite	8S	Slight	Moderate	Severe	Slight	Moderate	Slash pine	70	8	Slash pine, South Florida slash pine, longleaf pine.
							Longleaf pine	60	4	
							South Florida slash pine	35	3	
							Sand live oak	---	---	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	Trees to plant
78----------------- Paisley	13W	Slight	Severe	Severe	Severe	Severe	Slash pine----------	100	13	Slash pine, South Florida slash pine.
							South Florida slash pine---------------	45	4	
							Cabbage palm--------	---	---	
							Sweetgum------------	---	---	
							Live oak------------	---	---	
80----------------- Chobee	6W	Slight	Severe	Moderate	Slight	Severe	Baldcypress---------	100	6	**
							Red maple-----------	---	---	
							Sweetgum------------	---	---	
							Blackgum------------	---	---	
82----------------- Felda	10W	Slight	Moderate	Severe	Slight	Moderate	Slash pine----------	80	10	Slash pine, South Florida slash pine.
							Longleaf pine-------	65	5	
							South Florida slash pine---------------	45	4	
							Water oak-----------	---	---	
							Cabbage palm--------	---	---	
							Red maple-----------	---	---	
83----------------- Archbold	3S	Slight	Severe	Moderate	Slight	Slight	Sand pine-----------	60	3	Sand pine.
							South Florida slash pine---------------	35	3	
							Myrtle oak----------	---	---	
							Scrub hickory-------	---	---	
							Sand live oak-------	---	---	
							Chapman oak---------	---	---	
85----------------- Winder	2W	Slight	Severe	Severe	Moderate	Severe	Pondcypress---------	75	2	**
							Baldcypress---------	---	---	
							Blackgum------------	---	---	
							Cabbage palm--------	---	---	
							Loblollybay gordonia	---	---	
							Red maple-----------	---	---	
							Sweetbay------------	---	---	
86----------------- Felda	2W	Slight	Severe	Severe	Moderate	Severe	Pondcypress---------	75	2	**
							Baldcypress---------	---	---	
							Blackgum------------	---	---	
							Cabbage palm--------	---	---	
							Loblollybay gordonia	---	---	
							Red maple-----------	---	---	
							Sweetbay------------	---	---	

See footnotes at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Productivity class*	
87----------------- Basinger	8W	Slight	Severe	Severe	Slight	Severe	Slash pine---------- Longleaf pine------- South Florida slash pine--------------- Cypress-------------	70 60 35 ---	8 4 3 ---	Slash pine, South Florida slash pine.

* Productivity class is the yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

** No recommended trees to plant because of severe ratings for management concerns.

TABLE 9.--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
2 Apopka	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
3 Candler	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
4 Candler	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Severe: droughty.
5 EauGallie	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, droughty.
6 Eaton	Severe: ponding, too sandy.	Severe: ponding, too sandy.	Severe: too sandy, ponding.	Severe: ponding, too sandy.	Severe: ponding.
7 Pomona	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
8 Hydraquents	Severe: ponding, percs slowly, too clayey.	Severe: ponding, too clayey, percs slowly.	Severe: too clayey, ponding, percs slowly.	Severe: ponding, too clayey.	Severe: ponding, too clayey.
9 Lynne	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
10 Malabar	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
11. Arents-Water					
12 Neilhurst	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
13 Samsula	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
14 Sparr	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: wetness, too sandy, droughty.
15 Tavares	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
16. Urban land.					

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
17:					
Smyrna	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
Myakka	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
19 Floridana	Severe: ponding, percs slowly, too sandy.	Severe: ponding, too sandy, percs slowly.	Severe: too sandy, ponding, percs slowly.	Severe: ponding, too sandy.	Severe: ponding.
20 Fort Meade	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
21 Immokalee	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
22 Pomello	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
23 Ona	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
24 Nittaw	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
25:					
Placid	Severe: ponding, too sandy.	Severe: ponding, too sandy.	Severe: too sandy, ponding.	Severe: ponding, too sandy.	Severe: ponding.
Myakka	Severe: ponding, too sandy.	Severe: ponding, too sandy.	Severe: too sandy, ponding.	Severe: ponding, too sandy.	Severe: ponding.
26 Lochloosa	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Slight.
27 Kendrick	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
29 St. Lucie	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
30 Pompano	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
31 Adamsville	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty, too sandy.
32 Kaliga	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
33 Holopaw	Severe: ponding, too sandy.	Severe: ponding, too sandy.	Severe: too sandy, ponding.	Severe: ponding, too sandy.	Severe: ponding, droughty.
34 Anclote	Severe: ponding, too sandy.	Severe: ponding, too sandy.	Severe: too sandy, ponding.	Severe: ponding, too sandy.	Severe: ponding.
35 Hontoon	Severe: excess humus, ponding.	Severe: excess humus, ponding.	Severe: excess humus, ponding.	Severe: excess humus, ponding.	Severe: ponding, excess humus.
36 Basinger	Severe: ponding.	Severe: ponding, too sandy.	Severe: too sandy, ponding.	Severe: ponding, too sandy.	Severe: ponding.
37 Placid	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness, flooding.	Severe: wetness, too sandy.	Severe: wetness, flooding.
38 Electra	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
39. Arents					
40 Wauchula	Severe: too sandy, wetness.	Severe: too sandy, wetness.	Severe: too sandy, wetness.	Severe: too sandy, wetness.	Severe: wetness.
41 St. Johns	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
42 Felda	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
43 Oldsmar	Severe: wetness, percs slowly, too sandy.	Severe: wetness, too sandy, percs slowly.	Severe: too sandy, wetness, percs slowly.	Severe: wetness, too sandy.	Severe: wetness, droughty.
44 Paisley	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
46 Astatula	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
47 Zolfo	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty, too sandy.
48 Chobee	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
49:					
Adamsville	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty, too sandy.
Urban land.					
50:					
Candler	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
Urban land.					
51:					
Pomona	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
Urban land.					
53:					
Myakka	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
Immokalee	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
Urban land.					
54:					
Pomello	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
Urban land.					
55:					
Sparr	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: wetness, too sandy, droughty.
Urban land.					
57 Haplaquents	Severe: ponding.	Severe: ponding, too clayey.	Severe: too clayey, ponding, percs slowly.	Severe: ponding, too clayey.	Severe: ponding, too clayey.
58. Udorthents					
59. Arents-Urban land					
60. Arents					

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
61:					
Arents	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: wetness.
Urban land.					
62 Wabasso	Severe: wetness, percs slowly, too sandy.	Severe: wetness, too sandy, percs slowly.	Severe: too sandy, wetness, percs slowly.	Severe: wetness, too sandy.	Severe: wetness.
63:					
Tavares	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
Urban land.					
64:					
Neilhurst	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
Urban land.					
66:					
Fort Meade	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty, too sandy.
Urban land.					
67 Bradenton	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
68. Arents					
70 Duette	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
72:					
Bradenton	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness, flooding.	Severe: wetness, too sandy.	Severe: wetness, flooding.
Felda	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness, flooding.	Severe: wetness, too sandy.	Severe: wetness, droughty, flooding.
Chobee	Severe: flooding, wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, flooding, percs slowly.	Severe: wetness.	Severe: wetness, flooding.
73. Gypsum land					
74 Narcoossee	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
75--------------------- Valkaria	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, droughty.
76--------------------- Millhopper	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
77--------------------- Satellite	Severe: wetness, too sandy.	Severe: too sandy.	Severe: too sandy, wetness.	Severe: too sandy.	Severe: droughty.
78--------------------- Paisley	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy, large stones.	Severe: wetness, too sandy.	Severe: wetness, large stones.
80--------------------- Chobee	Severe: flooding, wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, flooding, percs slowly.	Severe: wetness.	Severe: wetness, flooding.
81--------------------- St. Augustine	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
82--------------------- Felda	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness, flooding.	Severe: wetness, too sandy.	Severe: wetness, droughty, flooding.
83--------------------- Archbold	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
85--------------------- Winder	Severe: ponding, percs slowly, too sandy.	Severe: ponding, too sandy, percs slowly.	Severe: too sandy, ponding, percs slowly.	Severe: ponding, too sandy.	Severe: ponding.
86--------------------- Felda	Severe: ponding, too sandy.	Severe: ponding, too sandy.	Severe: too sandy, ponding.	Severe: ponding, too sandy.	Severe: ponding, droughty.
87--------------------- Basinger	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.

TABLE 10.--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: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
2. Apopka	Poor	Fair	Fair	Poor	Fair	Very poor.	Very poor.	Fair	Poor	Very poor.
3, 4. Candler	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
5. EauGallie	Poor	Poor	Fair	Poor	Poor	Poor	Poor	Poor	Poor	Poor.
6. Eaton	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
7. Pomona	Poor	Fair	Fair	Poor	Poor	Fair	Fair	Fair	Poor	Fair.
8. Hydraquents	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Fair	Good	Very poor.	Very poor.	Fair.
9. Lynne	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Fair	Fair	Fair.
10. Malabar	Poor	Poor	Poor	Poor	Poor	Fair	Fair	Poor	Poor	Fair.
11. Arents-Water										
12. Neilhurst	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
13. Samsula	Very poor.	Very poor.	Poor	Fair	Very poor.	Good	Good	Very poor.	Poor	Good.
14. Sparr	Poor	Fair	Good	Fair	Fair	Poor	Fair	Fair	Fair	Poor.
15. Tavares	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
16. Urban land										
17: Smyrna	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Fair	Fair	Fair.
Myakka	Poor	Fair	Fair	Poor	Poor	Fair	Poor	Fair	Poor	Poor.
19. Floridana	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
20. Fort Meade	Fair	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
21. Immokalee	Poor	Poor	Fair	Poor	Poor	Fair	Poor	Poor	Poor	Poor.

TABLE 10.--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
22----------------- Pomello	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
23-----------------	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Fair	Fair	Fair.
24----------------- Nittaw	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
25:										
Placid------------	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
Myakka------------	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Fair	Good	Very poor.	Very poor.	Good.
26----------------- Lochloosa	Fair	Fair	Good	Good	Good	Poor	Fair	Fair	Good	Poor.
27----------------- Kendrick	Fair	Fair	Good	Good	Good	Poor	Poor	Fair	Good	Very poor.
29----------------- St. Lucie	Very poor.	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
30----------------- Pompano	Poor	Fair	Poor	Poor	Poor	Fair	Fair	Poor	Poor	Fair.
31----------------- Adamsville	Poor	Poor	Fair	Fair	Fair	Poor	Poor	Poor	Fair	Poor.
32----------------- Kaliga	Very poor.	Very poor.	Poor	Poor	Very poor.	Good	Good	Very poor.	Poor	Good.
33----------------- Holopaw	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
34----------------- Anclote	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
35----------------- Hontoon	Very poor.	Very poor.	Poor	Poor	Very poor.	Good	Good	Very poor.	Poor	Good.
36----------------- Basinger	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
37----------------- Placid	Very poor.	Very poor.	Poor	Fair	Poor	Good	Fair	Very poor.	Poor	Good.
38----------------- Electra	Poor	Poor	Fair	Poor	Poor	Poor	Poor	Poor	Poor	Poor.
39. Arents										
40----------------- Wauchula	Poor	Poor	Fair	Poor	Poor	Poor	Poor	Poor	Poor	Poor.
41----------------- St. Johns	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Fair	Fair	Fair.

TABLE 10.--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
42----------------- Felda	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Fair	Poor	Fair.
43----------------- Oldsmar	Poor	Fair	Fair	Poor	Fair	Poor	Poor	Fair	Fair	Poor.
44----------------- Paisley	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
46----------------- Astatula	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
47----------------- Zolfo	Poor	Poor	Fair	Fair	Fair	Poor	Poor	Poor	Fair	Poor.
48----------------- Chobee	Very poor.	Very poor.	Very poor.	Fair	Very poor.	Good	Good	Very poor.	Poor	Good.
49:										
Adamsville--------	Poor	Poor	Fair	Fair	Fair	Poor	Poor	Poor	Fair	Poor.
Urban land.										
50:										
Candler-----------	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Urban land.										
51:										
Pomona------------	Poor	Fair	Fair	Poor	Poor	Fair	Fair	Fair	Poor	Fair.
Urban land.										
53:										
Myakka------------	Poor	Fair	Fair	Poor	Poor	Fair	Poor	Fair	Poor	Poor.
Immokalee---------	Poor	Poor	Fair	Poor	Poor	Fair	Poor	Poor	Poor	Poor.
Urban land.										
54:										
Pomello-----------	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Urban land.										
55:										
Sparr-------------	Poor	Fair	Good	Fair	Fair	Poor	Fair	Fair	Fair	Poor.
Urban land.										
57----------------- Haplaquents	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
58. Udorthents										
59. Arents-Urban land										

TABLE 10.--WILDLIFE HABITAT--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hardwood trees	Conif-erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
60. Arents										
61. Arents-Urban land										
62 Wabasso	Poor	Poor	Poor	Poor	Good	Fair	Poor	Poor	Fair	Poor.
63:										
Tavares	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Urban land.										
64:										
Neilhurst	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Urban land.										
66:										
Fort Meade	Fair	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Urban land.										
67 Bradenton	Poor	Fair	Fair	Fair	Fair	Poor	Fair	Fair	Fair	Poor.
68. Arents										
70 Duette	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
72:										
Bradenton	Poor	Fair	Fair	Fair	Fair	Poor	Fair	Fair	Fair	Poor.
Felda	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Fair	Poor	Fair.
Chobee	Poor	Poor	Poor	Fair	Poor	Good	Good	Poor	Poor	Good.
73. Gypsum land										
74 Narcoossee	Poor	Poor	Fair	Fair	Fair	Poor	Poor	Poor	Fair	Poor.
75 Valkaria	Poor	Fair	Fair	Fair	Fair	Good	Fair	Poor	Poor	Good.
76 Millhopper	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
77 Satellite	Very poor.	Poor	Poor	Poor	Poor	Poor	Very poor.	Poor	Poor	Very poor.
78 Paisley	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.

TABLE 10.--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
80----------------- Chobee	Poor	Poor	Poor	Fair	Poor	Good	Good	Poor	Poor	Good.
81----------------- St. Augustine	Very poor.	Very poor.	Very poor.	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor.
82----------------- Felda	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Fair	Poor	Fair.
83----------------- Archbold	Very poor.	Poor	Poor	Very poor.	Poor	Very poor.	Very poor.	Poor	Very poor.	Very poor.
85----------------- Winder	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
86----------------- Felda	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
87----------------- Basinger	Poor	Poor	Fair	Poor	Poor	Good	Fair	Poor	Poor	Fair.

TABLE 11.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
2 Apopka	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Severe: droughty.
3 Candler	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Severe: droughty.
4 Candler	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Severe: droughty.
5 EauGallie	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
6 Eaton	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
7 Pomona	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
8 Hydraquents	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: low strength, ponding, shrink-swell.	Severe: ponding, too clayey.
9 Lynne	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
10 Malabar	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
11. Arents-Water						
12 Neilhurst	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
13 Samsula	Severe: cutbanks cave, excess humus, ponding.	Severe: ponding, low strength.	Severe: ponding.	Severe: ponding, low strength.	Severe: ponding.	Severe: ponding, excess humus.
14 Sparr	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, too sandy, droughty.
15 Tavares	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Severe: droughty.

TABLE 11.--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
16. Urban land						
17:						
Smyrna	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Myakka	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
19 Floridana	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
20 Fort Meade	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Moderate: droughty, too sandy.
21 Immokalee	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
22 Pomello	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: droughty.
23 Ona	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
24 Nittaw	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness, flooding.
25:						
Placid	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Myakka	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
26 Lochloosa	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Slight.
27 Kendrick	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
29 St. Lucie	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Severe: droughty.
30 Pompano	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.

TABLE 11.--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
31----------------- Adamsville	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: droughty, too sandy.
32----------------- Kaliga	Severe: cutbanks cave, excess humus, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding.	Severe: ponding, excess humus.
33----------------- Holopaw	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, droughty.
34----------------- Anclote	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
35----------------- Hontoon	Severe: excess humus, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding.	Severe: ponding, excess humus.
36----------------- Basinger	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
37----------------- Placid	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
38----------------- Electra	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: droughty.
39. Arents						
40----------------- Wauchula	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
41----------------- St. Johns	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
42----------------- Felda	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
43----------------- Oldsmar	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
44----------------- Paisley	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, wetness, shrink-swell.	Severe: wetness.
46----------------- Astatula	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Severe: droughty.

TABLE 11.--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
47----------------- Zolfo	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: droughty, too sandy.
48----------------- Chobee	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
49:						
Adamsville--------	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: droughty, too sandy.
Urban land.						
50:						
Candler-----------	Severe: cutbanks cave.	Slight----------	Slight----------	Slight----------	Slight----------	Severe: droughty.
Urban land.						
51:						
Pomona------------	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Urban land.						
53:						
Myakka------------	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Immokalee---------	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
Urban land.						
54:						
Pomello-----------	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: droughty.
Urban land.						
55:						
Sparr-------------	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, too sandy, droughty.
Urban land.						
57----------------- Haplaquents	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: shrink-swell, ponding.	Severe: ponding, too clayey.
58. Udorthents						

TABLE 11.--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
59:						
Arents	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: wetness.	Severe: droughty.
Urban land.						
60. Arents						
61:						
Arents	Severe: cutbanks cave, excess humus.	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Moderate: wetness.
Urban land.						
62 Wabasso	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
63:						
Tavares	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Severe: droughty.
Urban land.						
64:						
Neilhurst	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Severe: droughty.
Urban land.						
66:						
Fort Meade	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty, too sandy.
Urban land.						
67 Bradenton	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
68. Arents						
70 Duette	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Severe: droughty.
72:						
Bradenton	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
Felda	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, droughty, flooding.
Chobee	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.

TABLE 11.--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
73. Gypsum land						
74----------------- Narcoossee	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: droughty.
75----------------- Valkaria	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
76----------------- Millhopper	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Moderate: droughty.
77----------------- Satellite	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Severe: droughty.
78----------------- Paisley	Severe: wetness, large stones.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: low strength, wetness, shrink-swell.	Severe: wetness, large stones.
80----------------- Chobee	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
81----------------- St. Augustine	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: droughty.
82----------------- Felda	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, droughty, flooding.
83----------------- Archbold	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Severe: droughty.
85----------------- Winder	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
86----------------- Felda	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, droughty.
87----------------- Basinger	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

TABLE 12.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
2 Apopka	Slight	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.
3, 4 Candler	Slight*	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
5 EauGallie	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness, seepage, too sandy.	Severe: wetness, seepage.	Poor: too sandy, wetness, seepage.
6 Eaton	Severe: ponding, percs slowly, poor filter.	Severe: seepage, ponding.	Severe: ponding, too clayey.	Severe: seepage, ponding.	Poor: too clayey, hard to pack, ponding.
7 Pomona	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
8 Hydraquents	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
9 Lynne	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: wetness.	Severe: seepage, wetness.	Poor: hard to pack, wetness.
10 Malabar	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
11. Arents-Water					
12 Neilhurst	Slight*	Severe: seepage.	Severe: too sandy, seepage.	Severe: seepage.	Poor: seepage, too sandy.
13 Samsula	Severe: ponding, poor filter.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus.
14 Sparr	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.

See footnote at end of table.

TABLE 12.--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
15 Tavares	Moderate:* wetness.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
16. Urban land					
17:					
Smyrna	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Myakka	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
19 Floridana	Severe: ponding, percs slowly, poor filter.	Severe: seepage, ponding.	Severe: ponding.	Severe: ponding, seepage.	Poor: ponding.
20 Fort Meade	Slight*	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy.
21 Immokalee	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
22 Pomello	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
23 Ona	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
24 Nittaw	Severe: flooding, wetness, percs slowly.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
25:					
Placid	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
Myakka	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.

See footnote at end of table.

TABLE 12.--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
26 Lochloosa	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Severe: seepage, wetness.	Fair: wetness.
27 Kendrick	Slight	Severe: seepage.	Slight	Severe: seepage.	Good.
29 St. Lucie	Slight*	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
30 Pompano	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
31 Adamsville	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
32 Kaliga	Severe: ponding, poor filter.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding.	Severe: seepage, ponding.	Poor: ponding.
33 Holopaw	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
34 Anclote	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
35 Hontoon	Severe: subsides, ponding, poor filter.	Severe: excess humus, seepage, ponding.	Severe: excess humus, seepage, ponding.	Severe: seepage, ponding.	Poor: excess humus, ponding.
36 Basinger	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
37 Placid	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
38 Electra	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
39. Arents					
40 Wauchula	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: wetness.	Severe: seepage, wetness.	Poor: wetness.

See footnote at end of table.

TABLE 12.--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----------------- St. Johns	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
42----------------- Felda	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
43----------------- Oldsmar	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
44----------------- Paisley	Severe: wetness, percs slowly.	Slight-----------	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
46----------------- Astatula	Slight*----------	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
47----------------- Zolfo	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
48----------------- Chobee	Severe: ponding, percs slowly.	Severe: seepage, ponding.	Severe: seepage, ponding.	Severe: seepage, ponding.	Poor: seepage, ponding.
49:					
Adamsville---------	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
Urban land.					
50:					
Candler------------	Slight*----------	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Urban land.					
51:					
Pomona-------------	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Urban land.					

See footnote at end of table.

TABLE 12.--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:					
Myakka	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Immokalee	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Urban land.					
54:					
Pomello	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
Urban land.					
55:					
Sparr	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
Urban land.					
57 Haplaquents	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Severe: too clayey, hard to pack, ponding.
58. Udorthents					
59:					
Arents	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
Urban land.					
60. Arents					
61:					
Arents	Severe: wetness, poor filter.	Severe: excess humus, wetness.	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Poor: hard to pack.
Urban land.					
62 Wabasso	Severe: wetness, percs slowly, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.

See footnote at end of table.

TABLE 12.--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
63:					
Tavares	Moderate:* wetness.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Urban land.					
64:					
Neilhurst	Slight*	Severe: seepage.	Severe: too sandy, seepage.	Severe: seepage.	Poor: seepage, too sandy.
Urban land.					
66:					
Fort Meade	Slight*	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy.
Urban land.					
67 Bradenton	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
68. Arents					
70 Duette	Moderate: wetness.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
72:					
Bradenton	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
Felda	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
Chobee	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: wetness.
73. Gypsum land					
74 Narcoossee	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.

See footnote at end of table.

TABLE 12.--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
75: Valkaria	Severe: wetness, poor filter.	Severe: wetness, seepage.	Severe: wetness, seepage, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
76: Millhopper	Moderate: wetness.	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.
77: Satellite	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
78: Paisley	Severe: wetness, percs slowly, large stones.	Severe: flooding, wetness, large stones.	Severe: wetness, too clayey, large stones.	Severe: wetness.	Poor: too clayey, wetness, large stones.
80: Chobee	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: wetness.
81: St. Augustine	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
82: Felda	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
83: Archbold	Moderate:* wetness.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
85: Winder	Severe: ponding, percs slowly.	Severe: seepage, ponding.	Severe: seepage, ponding.	Severe: ponding.	Poor: ponding, thin layer.
86: Felda	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
87: Basinger	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.

* Because of poor filtration, ground water contamination is a hazard in many areas that have a concentration of homes with septic tanks.

TABLE 13.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
2. Apopka	Good	Probable	Improbable: too sandy.	Poor: too sandy.
3, 4. Candler	Good	Probable	Improbable: too sandy.	Poor: too sandy.
5. EauGallie	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
6. Eaton	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, wetness.
7. Pomona	Poor: wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy, wetness.
8. Hydraquents	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
9. Lynne	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, wetness.
10. Malabar	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
11. Arents-Water				
12. Neilhurst	Good	Probable	Improbable: too sandy.	Poor: too sandy.
13. Samsula	Poor: wetness.	Probable	Improbable: too sandy.	Poor: excess humus, wetness.
14. Sparr	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
15. Tavares	Good	Probable	Improbable: too sandy.	Poor: too sandy.
16. Urban land				

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
17:				
Smyrna	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
Myakka	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
19 Floridana	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, wetness.
20 Fort Meade	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
21 Immokalee	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
22 Pomello	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
23 Ona	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
24 Nittaw	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too clayey, wetness.
25:				
Placid	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
Myakka	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
26 Lochloosa	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
27 Kendrick	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
29 St. Lucie	Good	Probable	Improbable: too sandy.	Poor: too sandy.
30 Pompano	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
31 Adamsville	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
32 Kaliga	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
33: Holopaw	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
34: Anclote	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
35: Hontoon	Poor: wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: wetness, excess humus.
36: Basinger	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
37: Placid	Poor: wetness.	Probable	Improbable: too sandy.	Poor: wetness, too sandy.
38: Electra	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
39. Arents				
40: Wauchula	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, wetness.
41: St. Johns	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
42: Felda	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
43: Oldsmar	Poor: wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy, wetness.
44: Paisley	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
46: Astatula	Good	Probable	Improbable: too sandy.	Poor: too sandy.
47: Zolfo	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
48: Chobee	Poor: wetness.	Improbable: excess fines.	Improbable: too sandy.	Poor: wetness.
49:				
Adamsville	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
Urban land.				

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
50:				
Candler	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Urban land.				
51:				
Pomona	Poor: wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy, wetness.
Urban land.				
53:				
Myakka	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
Immokalee	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
Urban land.				
54:				
Pomello	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
Urban land.				
55:				
Sparr	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
Urban land.				
57 Haplaquents	Severe: shrink-swell, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
58. Udorthents				
59:				
Arents	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
Urban land.				
60. Arents				
61:				
Arents	Fair: thin layer.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy.
Urban land.				
62 Wabasso	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
63:				
Tavares	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Urban land.				
64:				
Neilhurst	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Urban land.				
66:				
Fort Meade	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
Urban land.				
67 Bradenton	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
68. Arents				
70 Duette	Good	Probable	Improbable: too sandy.	Poor: too sandy.
72:				
Bradenton	Poor: wetness.	Probable	Improbable: too sandy.	Poor: thin layer, wetness.
Felda	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
Chobee	Poor: wetness.	Probable	Improbable: too sandy.	Poor: wetness.
73. Gypsum land				
74 Narcoossee	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
75 Valkaria	Poor: wetness.	Probable	Improbable: too sandy.	Poor: wetness, too sandy.
76 Millhopper	Good	Probable	Improbable: too sandy.	Poor: too sandy.
77 Satellite	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
78 Paisley	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness, large stones.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
80: Chobee	Poor: wetness.	Probable	Improbable: too sandy.	Poor: wetness.
81: St. Augustine	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
82: Felda	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
83: Archbold	Good	Probable	Improbable: too sandy.	Poor: too sandy.
85: Winder	Poor: wetness.	Probable	Improbable: excess fines.	Poor: wetness.
86: Felda	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
87: Basinger	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.

TABLE 14.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Limitations for-- Aquifer-fed excavated ponds	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
2----------------- Apopka	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
3, 4-------------- Candler	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
5----------------- EauGallie	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Fast intake, wetness, droughty.	Wetness, too sandy, soil blowing.	Wetness, droughty.
6----------------- Eaton	Severe: seepage.	Severe: ponding.	Severe: slow refill, cutbanks cave.	Ponding, percs slowly.	Ponding, droughty, fast intake.	Ponding, soil blowing, percs slowly.	Wetness, droughty, percs slowly.
7----------------- Pomona	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
8----------------- Hydraquents	Slight---------	Severe: hard to pack, ponding.	Severe: slow refill.	Ponding, percs slowly.	Ponding, slow intake, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
9----------------- Lynne	Severe: seepage.	Severe: wetness.	Severe: slow refill, cutbanks cave.	Favorable------	Wetness, droughty, fast intake.	Wetness, soil blowing.	Wetness, droughty.
10---------------- Malabar	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
11. Arents-Water							
12---------------- Neilhurst	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water.	Slope, droughty, fast intake.	Too sandy------	Droughty.
13---------------- Samsula	Severe: seepage.	Severe: excess humus, ponding.	Severe: cutbanks cave.	Ponding, subsides.	Ponding, soil blowing.	Ponding, soil blowing.	Wetness.

TABLE 14.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Limitations for-- Aquifer-fed excavated ponds	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
14: Sparr	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Droughty.
15: Tavares	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
16. Urban land							
17:							
Smyrna	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
Myakka	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty.	Wetness, too sandy, soil blowing.	Wetness, droughty.
19: Floridana	Severe: seepage.	Severe: ponding.	Severe: slow refill, cutbanks cave.	Ponding, percs slowly.	Ponding, fast intake, soil blowing.	Ponding, soil blowing, percs slowly.	Wetness, percs slowly.
20: Fort Meade	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water.	Droughty, fast intake.	Too sandy, soil blowing.	Wetness, percs slowly.
21: Immokalee	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Droughty, fast intake.	Too sandy, soil blowing.	Droughty.
22: Pomello	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Droughty.
23: Ona	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy.	Wetness, droughty.
24: Nittaw	Slight	Severe: hard to pack, wetness.	Severe: slow refill, cutbanks cave.	Percs slowly, flooding.	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.

TABLE 14.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
25:							
Placid	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, fast intake, soil blowing.	Ponding, too sandy, soil blowing.	Wetness.
Myakka	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, droughty, fast intake.	Ponding, too sandy, soil blowing.	Wetness, droughty.
26 Lochloosa	Severe: seepage.	Moderate: wetness.	Severe: cutbanks cave.	Favorable	Wetness, fast intake, soil blowing.	Wetness, soil blowing.	Favorable.
27 Kendrick	Severe: seepage.	Slight	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Soil blowing	Droughty, rooting depth.
29 St. Lucie	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
30 Pompano	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
31 Adamsville	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Droughty.
32 Kaliga	Severe: seepage.	Severe: piping, ponding.	Severe: cutbanks cave.	Ponding, subsides.	Ponding	Ponding	Wetness.
33 Holopaw	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, droughty, fast intake.	Ponding, too sandy, soil blowing.	Wetness, droughty.
34 Anclote	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, droughty, fast intake.	Ponding, too sandy, soil blowing.	Wetness, droughty.
35 Hontoon	Severe: seepage.	Severe: excess humus, ponding.	Severe: cutbanks cave.	Subsides, ponding.	Ponding, soil blowing.	Ponding, soil blowing.	Wetness.

TABLE 14.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
36: Basinger	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, droughty, fast intake.	Ponding, too sandy, soil blowing.	Wetness, droughty.
37: Placid	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
38: Electra	Severe: seepage.	Severe: seepage, piping.	Severe: slow refill, cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Droughty.
39. Arents							
40: Wauchula	Severe: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Percs slowly	Wetness, fast intake, soil blowing.	Wetness, erodes easily, soil blowing.	Wetness, erodes easily, percs slowly.
41: St. Johns	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Wetness, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy.	Wetness.
42: Felda	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
43: Oldsmar	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill.	Percs slowly, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy.	Wetness, droughty.
44: Paisley	Slight	Severe: wetness.	Severe: slow refill.	Percs slowly	Wetness, fast intake, soil blowing.	Wetness, soil blowing, percs slowly.	Wetness, percs slowly.
46: Astatula	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
47: Zolfo	Severe: seepage.	Severe: seepage.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Droughty.

TABLE 14.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
48 Chobee	Moderate: seepage.	Severe: ponding, piping, seepage.	Severe: slow refill, cutbanks cave.	Ponding, percs slowly.	Ponding, soil blowing, percs slowly.	Ponding, soil blowing, percs slowly.	Wetness, percs slowly.
49: Adamsville	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Droughty.
Urban land.							
50: Candler	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
Urban land.							
51: Pomona	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
Urban land.							
53: Myakka	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty.	Wetness, too sandy, soil blowing.	Wetness, droughty.
Immokalee	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
Urban land.							
54: Pomello	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Droughty.
Urban land.							

TABLE 14.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
55:							
Sparr	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Droughty.
Urban land.							
57 Haplaquents	Slight	Severe: hard to pack, ponding.	Severe: slow refill.	Percs slowly	Ponding, slow intake.	Ponding	Wetness.
58. Udorthents							
59:							
Arents	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave, slope.	Droughty.	Wetness, too sandy, soil blowing.	Droughty.
Urban land.							
60. Arents							
61:							
Arents	Severe: seepage.	Severe: seepage, hard to pack.	Moderate: deep to water.	Cutbanks cave	Droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
Urban land.							
62 Wabasso	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Percs slowly, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty, rooting depth.
63:							
Tavares	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
Urban land.							
64:							
Neilhurst	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Too sandy	Droughty.
Urban land.							

TABLE 14.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
66:							
Fort Meade	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake.	Too sandy, soil blowing.	Droughty.
Urban land.							
67 Bradenton	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy.	Wetness, droughty.
68. Arents							
70 Duette	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
72:							
Bradenton	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Cutbanks cave, flooding.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
Felda	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
Chobee	Slight	Severe: wetness.	Severe: slow refill, cutbanks cave.	Percs slowly, flooding.	Wetness, soil blowing.	Wetness, soil blowing, percs slowly.	Wetness, rooting depth, percs slowly.
73. Gypsum land							
74 Narcoossee	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Droughty.
75 Valkaria	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
76 Millhopper	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.

TABLE 14.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Limitations for-- Aquifer-fed excavated ponds	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
7----------------- Satellite	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
8----------------- Paisley	Slight---------	Severe: wetness, large stones.	Severe: slow refill, large stones.	Percs slowly, large stones.	Wetness, fast intake, soil blowing.	Wetness, percs slowly, large stones.	Wetness, soil blowing, percs slowly.
0----------------- Chobee	Slight---------	Severe: wetness.	Severe: slow refill, cutbanks cave.	Percs slowly, flooding.	Wetness, soil blowing.	Wetness, soil blowing, percs slowly.	Wetness, rooting depth, percs slowly.
1----------------- St. Augustine	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Droughty.
2----------------- Felda	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
3----------------- Archbold	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
5----------------- Winder	Severe: seepage.	Severe: seepage, ponding.	Severe: seepage.	Ponding, percs slowly.	Ponding, droughty, fast intake.	Ponding, soil blowing, percs slowly.	Wetness, droughty, percs slowly.
6----------------- Felda	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, droughty, fast intake.	Ponding, too sandy, soil blowing.	Wetness, droughty.
7----------------- Basinger	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.

TABLE 15.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated. Some soils may have Unified classifications and USDA textures in addition to those shown. In general, the dominant classifications and textures are shown]

Map symbol and soil name	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
2------------------ Apopka	0-51	Fine sand, sand	SP, SP-SM	A-3	0	100	100	85-100	3-10	---	NP
	51-80	Sandy loam, sandy clay loam, sandy clay, fine sandy loam.	SM-SC, SC	A-2-4, A-2-6, A-4, A-6	0	98-100	95-100	60-95	20-40	20-40	4-20
3, 4------------- Candler	0-80	Sand, fine sand	SP, SP-SM	A-3	0	100	95-100	75-100	2-8	---	NP
5------------------ EauGallie	0-26	Fine sand--------	SP, SP-SM	A-3	0	100	100	80-98	2-5	---	NP
	26-32	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	100	100	80-98	5-20	---	NP
	32-52	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-98	2-12	---	NP
	52-80	Sandy loam, fine sandy loam, sandy clay loam.	SM, SM-SC, SC	A-2-4, A-2-6	0	100	100	80-98	20-35	<40	NP-20
6------------------ Eaton	0-6	Mucky fine sand	SP-SM	A-3, A-2-4	0	100	95-100	75-99	5-12	---	NP
	6-29	Fine sand, sand	SM, SP-SM	A-2-4, A-3	0	100	95-100	75-99	5-20	---	NP
	29-33	Sandy clay loam	SC	A-7, A-4, A-6	0	100	95-100	90-100	36-45	25-45	8-20
	33-80	Sandy clay, clay	SC, CL, CH	A-7	0	100	95-100	90-100	45-65	45-65	20-40
7------------------ Pomona	0-6	Fine sand--------	SP, SP-SM	A-3, A-2-4	0	100	100	85-100	2-12	---	NP
	6-21	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	85-100	2-12	---	NP
	21-26	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	100	100	85-100	5-19	---	NP
	26-48	Sand, fine sand	SP, SP-SM, SM	A-3, A-2-4	0	100	100	85-100	2-16	---	NP
	48-73	Sandy clay loam, sandy loam, sandy clay.	SC, SM-SC, SM	A-2, A-4, A-6	0	100	95-100	85-100	25-50	<40	NP-16
	73-80	Variable---------	---	---	---	---	---	---	---	---	---
8------------------ Hydraquents	0-80	Clay-------------	CH	A-7	0	100	100	90-100	85-99	60-90	30-55
9------------------ Lynne	0-5	Sand-------------	SP, SP-SM	A-3	0	100	100	90-100	3-10	---	NP
	5-21	Sand, fine sand	SP, SP-SM	A-3	0	100	100	90-100	3-10	---	NP
	21-28	Sand, fine sand, loamy sand.	SP-SM, SM	A-3, A-2-4	0	100	100	90-100	8-18	---	NP
	28-33	Sand, fine sand	SP-SM	A-3, A-2-4	0	100	100	90-100	5-12	---	NP
	33-80	Sandy clay, clay loam, sandy clay loam.	SC, CH, CL	A-6, A-7	0	100	100	90-100	40-60	35-60	20-40

TABLE 15.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
10---------------- Malabar	0-22	Fine sand, sand	SP, SP-SM	A-3	0	100	100	80-100	2-10	---	NP
	22-38	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	3-12	---	NP
	38-48	Sand, fine sand	SP, SP-SM	A-3	0	100	100	80-100	2-10	---	NP
	48-80	Sandy clay loam, fine sandy loam, sandy loam.	SC, SM-SC, SM	A-2, A-4, A-6	0	100	100	80-100	20-40	<35	NP-20
11. Arents-Water											
12---------------- Neilhurst	0-80	Sand-------------	SP, SP-SM	A-3, A-2-4	0	100	98-100	50-80	1-7	---	NP
13---------------- Samsula	0-31	Muck-------------	PT	---	---	---	---	---	---	---	---
	31-80	Sand, fine sand, loamy sand.	SP-SM, SM, SP	A-3, A-2-4	0	100	100	80-100	2-20	---	NP
14---------------- Sparr	0-8	Sand-------------	SP-SM, SM	A-3, A-2-4	0	100	100	75-99	5-14	---	NP
	8-57	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	100	100	75-99	5-14	---	NP
	57-80	Sandy loam, sandy clay loam, fine sandy loam.	SM-SC, SC, SM	A-2-4, A-6	0	100	100	75-99	25-44	<31	NP-16
15---------------- Tavares	0-80	Fine sand, sand	SP, SP-SM	A-3	0	100	95-100	85-100	2-10	---	NP
16. Urban land											
17:											
Smyrna-----------	0-12	Fine sand, sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
	12-25	Sand, fine sand, loamy fine sand.	SM, SP-SM	A-3, A-2-4	0	100	100	80-100	5-20	---	NP
	25-42	Sand, fine sand	SP, SP-SM	A-3	0	100	100	80-100	2-10	---	NP
	42-48	Sand, fine sand, loamy fine sand.	SM, SP-SM	A-3, A-2-4	0	100	100	80-100	5-20	---	NP
	48-80	Sand, fine sand	SP, SP-SM	A-3	0	100	100	80-100	2-10	---	NP
Myakka-----------	0-25	Fine sand---------	SP, SP-SM	A-3	0	100	100	85-100	2-10	---	NP
	25-36	Sand, fine sand, loamy fine sand.	SM, SP-SM	A-3, A-2-4	0	100	100	85-100	4-20	---	NP
	36-80	Sand, fine sand	SP, SP-SM	A-3	0	100	100	85-100	2-8	---	NP
19---------------- Floridana	0-15	Mucky fine sand, fine sand.	SP-SM, SM	A-3, A-2-4	0	100	100	80-90	5-25	---	NP
	15-28	Sand, fine sand	SP, SP-SM	A-3	0	100	100	80-90	2-10	---	NP
	28-80	Sandy loam, fine sandy loam, sandy clay loam.	SM-SC, SC	A-2-4, A-2-6	0	100	100	85-95	20-35	20-40	7-18

TABLE 15.--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	
20---------------- Fort Meade	0-80	Sand, fine sand, loamy fine sand, loamy sand.	SM	A-2-4	0	95-100	90-100	80-100	13-25	---	NP
21---------------- Immokalee	0-7	Sand-------------	SP, SP-SM	A-3	0	100	100	70-100	2-10	---	NP
	7-39	Fine sand, sand	SP, SP-SM	A-3	0	100	100	70-100	2-10	---	NP
	39-58	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	100	100	70-100	5-21	---	NP
	58-66	Fine sand, sand	SP, SP-SM	A-3	0	100	100	70-100	2-10	---	NP
	66-80	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	100	100	70-100	5-21	---	NP
22---------------- Pomello	0-48	Fine sand, sand	SP, SP-SM	A-3	0	100	100	60-100	1-8	---	NP
	48-63	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	100	100	60-100	6-15	---	NP
	63-80	Sand, fine sand	SP, SP-SM	A-3	0	100	100	60-100	4-10	---	NP
23---------------- Ona	0-10	Fine sand---------	SP-SM, SP	A-3	0	100	100	85-95	3-10	---	NP
	10-19	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	100	100	85-95	5-20	---	NP
	19-50	Fine sand, sand	SP-SM, SP	A-3	0	100	100	85-95	3-10	---	NP
	50-80	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	100	100	85-95	5-20	---	NP
24---------------- Nittaw	0-6	Sandy clay loam	SM, SM-SC, SC	A-2-4, A-2-6	0	100	100	90-99	15-35	<40	NP-15
	6-75	Sandy clay, clay	CH, CL	A-7	0	100	100	85-100	51-70	40-80	21-50
	75-80	Sand, loamy sand, fine sandy loam.	SP, SP-SM, SM, SM-SC	A-3, A-2-4	0	100	100	85-100	4-25	<28	NP-7
25:											
Placid-----------	0-18	Fine sand---------	SP, SP-SM, SM	A-3, A-2-4	0	100	100	90-100	1-20	---	NP
	18-80	Sand, fine sand, loamy fine sand.	SP, SP-SM, SM	A-3, A-2-4	0	100	100	90-100	1-20	---	NP
Myakka-----------	0-25	Fine sand---------	SP, SP-SM	A-3	0	100	100	85-100	2-10	---	NP
	25-36	Sand, fine sand, loamy fine sand.	SM, SP-SM	A-3, A-2-4	0	100	100	85-100	5-20	---	NP
	36-80	Sand, fine sand	SP, SP-SM	A-3	0	100	100	85-100	2-8	---	NP
26---------------- Lochloosa	0-36	Fine sand, loamy sand.	SP-SM, SM	A-2-4, A-3	0	95-100	95-100	90-98	8-20	---	NP
	36-80	Sandy clay loam, sandy loam, sandy clay.	SC, SM-SC	A-2, A-4, A-6	0	95-100	95-100	90-98	25-40	25-40	5-18
27---------------- Kendrick	0-29	Fine sand, loamy sand.	SP-SM, SM	A-3, A-2-4	0	95-100	90-100	75-100	5-19	---	NP
	29-34	Sandy clay loam, fine sandy loam, sandy loam.	SC, SM-SC	A-2-6, A-2-4	0	95-100	90-100	85-100	25-35	20-35	4-18
	34-64	Sandy clay loam, sandy clay.	SC	A-2-6, A-6	0	95-100	90-100	85-100	25-45	25-40	9-20
	64-80	Sandy clay loam, sandy loam.	SC, SM-SC	A-2-6, A-2-4	0	95-100	90-100	85-100	25-35	20-35	4-18
29---------------- St. Lucie	0-80	Sand, fine sand	SP	A-3	0	100	90-100	80-99	1-4	---	NP

TABLE 15.--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	
30--------------- Pompano	0-80	Fine sand, sand	SP, SP-SM	A-3, A-2-4	0	100	100	75-100	1-12	---	NP
31--------------- Adamsville	0-6	Fine sand--------	SP-SM	A-3, A-2-4	0	100	100	90-100	5-12	---	NP
	6-80	Fine sand, sand	SP-SM, SP	A-3, A-2-4	0	100	100	90-100	2-12	---	NP
32--------------- Kaliga	0-30	Muck-------------	PT	---	0	---	---	---	---	---	NP
	30-75	Sandy clay loam, sandy loam, fine sandy loam, loam.	SM, SM-SC, SC, ML	A-2, A-4, A-6	0	100	100	80-97	25-64	<35	NP-15
	75-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-90	2-12	---	NP
33--------------- Holopaw	0-41	Fine sand, sand	SP, SP-SM	A-3	0	100	95-100	70-95	2-10	---	NP
	41-65	Sandy loam, fine sandy loam, sandy clay loam.	SM, SM-SC	A-2-4	0	100	95-100	70-95	15-30	<25	NP-7
	65-80	Loamy sand, loamy fine sand, fine sand.	SM, SP-SM	A-2-4	0	100	95-100	70-95	11-20	---	NP
34--------------- Anclote	0-18	Mucky fine sand, sand, fine sand.	SP, SP-SM	A-3, A-2-4	0	100	95-100	85-100	2-12	---	NP
	18-80	Sand, fine sand, loamy fine sand, loamy sand.	SP, SP-SM, SM	A-3, A-2-4	0	100	95-100	85-100	2-20	---	NP
35--------------- Hontoon	0-75	Muck-------------	PT	A-8	0	---	---	---	---	---	---
	75-80	Variable---------	---	---	---	---	---	---	---	---	---
36--------------- Basinger	0-7	Mucky fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	85-100	1-12	---	NP
	7-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	85-100	2-12	---	NP
37--------------- Placid	0-18	Fine sand--------	SP, SP-SM, SM	A-3, A-2-4	0	100	100	90-100	1-20	---	NP
	18-80	Fine sand, sand, loamy fine sand.	SP, SP-SM, SM	A-3, A-2-4	0	100	100	90-100	1-20	---	NP
38--------------- Electra	0-6	Fine sand--------	SP, SP-SM	A-3	0	100	95-100	75-99	3-10	---	NP
	6-42	Sand, fine sand	SP, SP-SM	A-3	0	100	95-100	75-99	3-10	---	NP
	42-55	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	100	100	80-99	8-15	---	NP
	55-80	Sandy clay loam, sandy clay, fine sandy loam.	SC, SM-SC	A-2, A-4, A-6	0	100	100	80-99	20-45	20-40	4-20
39. Arents											

TABLE 15.--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	
40---------------- Wauchula	0-7	Fine sand--------	SP-SM	A-3, A-2-4	0	100	100	90-100	5-12	---	NP
	7-18	Sand, fine sand	SP-SM	A-3, A-2-4	0	100	100	90-100	5-12	---	NP
	18-26	Sand, fine sand, loamy fine sand.	SP-SM, SM	A-3, A-2-4	0	100	100	90-100	8-25	---	NP
	26-33	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	100	100	90-100	5-20	---	NP
	33-80	Sandy loam, fine sandy loam, sandy clay loam.	SM, SM-SC, SC	A-2-4, A-2-6, A-4, A-6	0	100	92-100	90-100	25-50	<40	NP-20
41---------------- St. Johns	0-12	Sand-------------	SP, SP-SM	A-3	0	100	100	75-95	3-10	---	NP
	12-22	Sand, fine sand	SP, SP-SM	A-3	0	100	100	85-95	3-10	---	NP
	22-65	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	100	100	85-95	5-20	---	NP
	65-80	Sand, fine sand	SP, SP-SM	A-3	0	100	100	80-90	2-10	---	NP
42---------------- Felda	0-22	Fine sand, sand	SP, SP-SM	A-3	0	100	100	90-99	2-5	---	NP
	22-80	Sandy loam, fine sandy loam, sandy clay loam.	SM, SM-SC, SC	A-2-4, A-2-6	0	100	100	90-99	15-35	<40	NP-15
43---------------- Oldsmar	0-36	Fine sand--------	SP, SP-SM	A-3	0	100	100	80-100	2-10	---	NP
	36-50	Fine sand, sand, loamy fine sand.	SM, SP-SM	A-2-4, A-3	0	100	100	80-100	5-20	---	NP
	50-80	Fine sandy loam, sandy loam, sandy clay loam.	SM-SC, SC	A-2-4, A-2-6	0	100	100	85-100	20-35	20-35	5-15
44---------------- Paisley	0-14	Fine sand--------	SP-SM	A-3, A-2-4	0	100	100	80-99	5-12	---	NP
	14-80	Sandy clay, clay	CH, CL	A-7	0	95-100	90-100	75-95	51-70	41-51	25-35
46---------------- Astatula	0-7	Sand-------------	SP, SP-SM	A-3	0	100	100	75-99	1-7	---	NP
	7-80	Sand, fine sand	SP, SP-SM	A-3	0	100	100	75-99	1-7	---	NP
47---------------- Zolfo	0-7	Fine sand--------	SP-SM	A-3, A-2-4	0	100	100	90-100	5-12	---	NP
	7-80	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	100	100	90-100	5-18	---	NP
48---------------- Chobee	0-12	Fine sandy loam	SP-SM, SM	A-2-4	0	100	100	85-100	12-25	<40	NP-10
	12-55	Sandy loam, fine sandy loam, sandy clay loam.	SP-SM, SM, SC, SM-SC	A-2-4, A-2-6, A-6, A-7	0	100	100	85-100	12-45	<45	NP-25
	55-80	Fine sand, loamy sand.	SP-SM, SM	A-2-4	0	100	100	80-100	12-25	<40	NP-10
49: Adamsville------	0-6	Fine sand--------	SP-SM	A-3, A-2-4	0	100	100	90-100	5-12	---	NP
	6-80	Fine sand, sand	SP-SM, SP	A-3, A-2-4	0	100	100	90-100	2-12	---	NP
Urban land.											

TABLE 15.--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	
50:											
Candler	0-80	Fine sand, sand	SP, SP-SM	A-3	0	100	95-100	75-100	2-8	---	NP
Urban land.											
51:											
Pomona	0-6	Fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	85-100	2-12	---	NP
	6-21	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	85-100	2-12	---	NP
	21-26	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	100	100	85-100	5-15	---	NP
	26-48	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	85-100	2-12	---	NP
	48-73	Sandy clay loam, sandy loam, sandy clay.	SC, SM-SC, SM	A-2, A-4, A-6	0	100	95-100	85-100	25-50	<40	NP-16
	73-80	Variable	---	---	---	---	---	---	---	---	
Urban land.											
53:											
Myakka	0-25	Fine sand	SP, SP-SM	A-3	0	100	100	85-100	2-10	---	NP
	25-36	Sand, fine sand, loamy fine sand.	SM, SP-SM	A-3, A-2-4	0	100	100	85-100	5-20	---	NP
	36-80	Sand, fine sand	SP, SP-SM	A-3	0	100	100	85-100	2-8	---	NP
Immokalee	0-7	Fine sand	SP, SP-SM	A-3	0	100	100	70-100	2-10	---	NP
	7-39	Fine sand, sand	SP, SP-SM	A-3	0	100	100	70-100	2-10	---	NP
	39-58	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	100	100	70-100	5-21	---	NP
	58-66	Fine sand, sand	SP, SP-SM	A-3	0	100	100	70-100	2-10	---	NP
	66-80	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	100	100	70-100	5-21	---	NP
Urban land.											
54:											
Pomello	0-48	Fine sand	SP, SP-SM	A-3	0	100	100	60-100	1-8	---	NP
	48-63	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	100	100	60-100	6-15	---	NP
	63-80	Sand, fine sand	SP, SP-SM	A-3	0	100	100	60-100	4-10	---	NP
Urban land.											
55:											
Sparr	0-8	Sand	SP-SM, SM	A-3, A-2-4	0	100	100	75-99	5-14	---	NP
	8-57	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	100	100	75-99	5-14	---	NP
	57-80	Sandy loam, sandy clay loam, fine sandy loam.	SM-SC, SC, SM	A-2-4, A-6	0	100	100	75-99	25-35	<30	NP-10
Urban land.											

TABLE 15.--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	
57--------------- Haplaquents	0-80	Clay--------------	CH	A-7	0	100	100	95-100	90-100	70-90	50-60
58. Udorthents											
59: Arents----------	0-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-95	2-12	---	NP
Urban land.											
60. Arents											
61: Arents----------	0-30	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-95	2-12	---	NP
	30-65	Muck-------------	PT	A-8	0	---	---	---	---	---	---
	65-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-95	2-12	---	NP
Urban land.											
62--------------- Wabasso	0-7	Fine sand--------	SP, SP-SM	A-3	0	100	100	95-100	2-10	---	NP
	7-22	Sand, fine sand	SP, SP-SM	A-3	0	100	100	95-100	2-10	---	NP
	22-30	Sand, fine sand, loamy sand.	SP-SM, SM	A-3, A-2-4	0	100	100	95-100	5-20	---	NP
	30-35	Sand, fine sand	SP, SP-SM	A-3	0	100	100	95-100	2-10	---	NP
	35-80	Sandy loam, fine sandy loam, sandy clay loam.	SC, SM-SC	A-2-4, A-2-6	0	100	100	95-100	20-35	20-30	5-13
63: Tavares---------	0-8	Sand-------------	SP, SP-SM	A-3	0	100	95-100	85-100	2-10	---	NP
	8-80	Sand, fine sand	SP, SP-SM	A-3	0	100	95-100	85-100	2-10	---	NP
Urban land.											
64: Neilhurst-------	0-80	Sand-------------	SP, SP-SM	A-3, A-2-4	0	100	98-100	50-80	1-7	---	NP
Urban land.											
66: Fort Meade------	0-25	Sand-------------	SM	A-2-4	0	95-100	90-100	80-100	13-25	---	NP
	25-80	Sand, loamy fine sand, fine sand, loamy sand.	SM	A-2-4	0	95-100	90-100	80-100	13-25	---	NP
Urban land.											

TABLE 15.--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	
67--------------- Bradenton	0-4	Fine sand--------	SP-SM	A-3, A-2-4	0	100	100	80-100	5-12	---	NP
	4-12	Loamy fine sand, fine sand.	SP-SM	A-3, A-2-4	0	100	100	80-100	5-12	---	NP
	12-22	Sandy loam, fine sandy loam, sandy clay loam, loamy fine sand.	SC, SM-SC	A-2-4, A-2-6	0	100	100	80-100	20-35	<40	4-18
	22-80	Fine sand, loamy fine sand, fine sandy loam, sandy clay loam.	SP-SM, SM, SM-SC, SC	A-3, A-2-4, A-2-6	0	100	100	80-100	5-35	<40	NP-18
68. Arents											
70--------------- Duette	0-7	Fine sand--------	SP	A-3	0	100	100	60-100	1-4	---	NP
	7-59	Fine sand, sand	SP	A-3	0	100	100	60-100	1-4	---	NP
	59-80	Fine sand, sand	SP, SP-SM	A-3, A-2-4	0	100	100	60-100	4-12	---	NP
72: Bradenton-------	0-6	Fine sand--------	SP-SM	A-3, A-2-4	0	100	100	80-100	5-12	---	NP
	6-12	Loamy fine sand, sand, fine sand.	SP-SM	A-3, A-2-4	0	100	100	80-100	5-12	---	NP
	12-21	Sandy loam, fine sandy loam, loamy fine sand.	SC, SM-SC	A-2-4, A-2-6	0	100	100	80-100	20-35	<40	4-18
	21-58	Fine sand, loamy fine sand, fine sandy loam, sandy clay loam.	SP-SM, SM, SM-SC, SC	A-3, A-2-4, A-2-6	0	100	100	80-100	5-35	<40	NP-18
	58-80	Sandy loam, fine sandy loam, sandy clay loam.	SM, SM-SC, SC	A-2-4, A-2-6	0	100	100	80-100	20-35	<40	NP-20
Felda-----------	0-22	Fine sand, sand	SP, SP-SM	A-3	0	100	100	90-99	2-5	---	NP
	22-35	Sandy loam, fine sandy loam, sandy clay loam.	SM, SM-SC, SC	A-2-4, A-2-6	0	100	100	90-99	15-35	<40	NP-15
	35-80	Sand, fine sand, loamy sand.	SP, SP-SM	A-3, A-2-4	0	100	100	80-99	2-12	---	NP
Chobee----------	0-12	Fine sandy loam	SP-SM, SM	A-2-4	0	100	100	85-99	12-25	<40	NP-10
	12-32	Sandy clay loam	SC	A-2-6, A-2-7, A-6, A-7	0	100	100	85-99	25-45	35-45	20-25
	32-80	Loamy sand, fine sand, sandy clay loam.	SP-SM, SM, SC, SM-SC	A-2-4, A-2-6, A-6, A-7	0	100	100	80-99	12-45	<45	NP-25
73. Gypsum land											
74--------------- Narcoossee	0-5	Sand-------------	SP-SM	A-3	0	100	100	95-100	5-10	---	NP
	5-17	Sand, fine sand	SP, SP-SM	A-3	0	100	100	95-100	2-8	---	NP
	17-22	Sand, fine sand	SP-SM	A-3, A-2-4	0	100	100	95-100	5-12	---	NP
	22-80	Sand, fine sand	SP, SP-SM	A-3	0	100	100	95-100	2-8	---	NP

TABLE 15.--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	
75--------------- Valkaria	0-5	Sand-------------	SP, SP-SM	A-3	0	100	75-100	75-100	2-10	---	NP
	5-26	Sand, fine sand	SP, SP-SM	A-3	0	100	75-100	75-100	2-10	---	NP
	26-46	Sand, fine sand	SP, SP-SM	A-3	0	100	75-100	75-100	3-10	---	NP
	46-80	Sand, fine sand	SP, SP-SM	A-3	0	100	75-100	75-100	2-10	---	NP
76--------------- Millhopper	0-63	Fine sand--------	SP-SM, SM	A-3, A-2-4	0	100	97-100	75-97	5-20	---	NP
	63-80	Sandy loam, fine sandy loam, sandy clay loam.	SM, SM-SC, SC	A-2-4, A-4	0	100	97-100	75-97	18-40	<28	NP-15
77--------------- Satellite	0-6	Sand-------------	SP	A-3	0	100	100	60-95	1-4	---	NP
	6-80	Sand, fine sand	SP	A-3	0	100	100	60-95	1-4	---	NP
78--------------- Paisley	0-18	Fine sand--------	SP-SM, SM	A-2-4, A-3	0-1	98-100	98-100	75-95	5-14	---	NP
	18-22	Sandy clay loam, sandy clay.	SC	A-6, A-7	0-1	95-100	95-100	90-98	40-50	35-45	15-25
	22-60	Sandy clay, clay	CH, CL	A-7	0-5	95-100	95-100	75-95	51-70	41-73	16-40
80--------------- Chobee	0-12	Fine sandy loam	SP-SM, SM	A-2-4	0	100	100	85-99	12-25	<40	NP-10
	12-32	Sandy clay loam	SC	A-2-6, A-2-7, A-6, A-7	0	100	100	85-99	25-45	35-45	20-25
	32-80	Loamy sand, fine sand, sandy clay loam.	SP-SM, SM, SC, SM-SC	A-2-4, A-2-6, A-6, A-7	0	100	100	80-99	12-45	<45	NP-25
81--------------- St. Augustine	0-2	Sand-------------	SP, SP-SM	A-3	0	85-95	80-95	80-90	2-5	---	NP
	2-80	Sand-------------	SP-SM, SM	A-3, A-2-4	0	85-95	80-95	80-90	5-15	---	NP
82--------------- Felda	0-22	Fine sand, sand	SP, SP-SM	A-3	0	100	100	90-99	2-5	---	NP
	22-35	Sandy loam, fine sandy loam, sandy clay loam.	SM, SM-SC, SC	A-2-4, A-2-6	0	100	100	90-99	15-35	<40	NP-15
	35-80	Sand, fine sand, loamy sand.	SP, SP-SM	A-3, A-2-4	0	100	100	80-99	2-12	---	NP
83--------------- Archbold	0-4	Sand-------------	SP	A-3	0	100	100	89-99	1-3	---	NP
	4-80	Sand, fine sand	SP	A-3	0	100	100	89-99	1-3	---	NP
85--------------- Winder	0-16	Fine sand, sand, loamy sand.	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
	16-50	Sandy clay loam	SC	A-2-4, A-2-6	0	100	100	80-100	18-35	20-40	9-26
	50-80	Sandy loam, fine sandy loam, sandy clay loam.	SM, SM-SC, SC, GM-GC	A-2-4, A-2-6, A-1-B	0	60-100	50-95	40-90	15-35	<35	NP-20
86--------------- Felda	0-6	Fine sand--------	SP, SP-SM	A-3	0	100	100	90-100	2-5	---	NP
	6-27	Sand, fine sand	SP, SP-SM	A-3	0	100	100	90-100	2-5	---	NP
	27-45	Sandy loam, fine sandy loam, sandy clay loam.	SM, SM-SC, SC	A-2-4, A-2-6	0	100	100	90-100	15-35	<40	NP-15
	45-80	Sand, fine sand, loamy sand.	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP

TABLE 15.--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	
87---------------- Basinger	0-19	Fine sand, sand	SP	A-3	0	100	100	85-100	1-4	---	NP
	19-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	85-100	2-12	---	NP

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
2---------------- Apopka	0-51	<3	1.45-1.60	6.0-20	0.03-0.05	4.5-6.0	Low-------	0.10	5	1	<2
	51-80	18-37	1.55-1.75	0.6-2.0	0.12-0.17	4.5-6.0	Low-------	0.24			
3, 4------------- Candler	0-80	<3	1.35-1.55	6.0-20	0.03-0.08	4.5-6.0	Low-------	0.10	5	1	.5-2
5---------------- EauGallie	0-26	<5	1.25-1.50	6.0-20	0.02-0.07	4.5-6.0	Low-------	0.10	5	1	2-8
	26-32	1-8	1.45-1.60	0.6-6.0	0.15-0.25	4.5-6.5	Low-------	0.15			
	32-52	1-5	1.45-1.65	6.0-20	0.02-0.05	4.5-7.8	Low-------	0.10			
	52-80	13-31	1.55-1.70	0.06-2.0	0.10-0.20	4.5-7.8	Low-------	0.20			
6---------------- Eaton	0-6	2-8	1.15-1.25	6.0-20	0.15-0.20	4.5-5.5	Low-------	0.10	5	8	6-15
	6-29	2-10	1.30-1.55	6.0-20	0.05-0.10	4.5-6.0	Moderate	0.10			
	29-33	20-35	1.55-1.70	0.06-0.2	0.12-0.17	4.5-6.5	Moderate	0.24			
	33-80	35-55	1.55-1.70	0.06-0.2	0.10-0.15	4.5-6.5	Moderate	0.28			
7---------------- Pomona	0-6	1-6	1.10-1.50	6.0-20	0.05-0.10	3.6-5.5	Low-------	0.10	5	1	1-4
	6-21	<6	1.45-1.70	6.0-20	0.03-0.08	3.6-5.5	Low-------	0.10			
	21-26	2-7	1.30-1.60	0.6-6.0	0.10-0.20	3.6-5.5	Low-------	0.15			
	26-48	1-6	1.40-1.70	2.0-20	0.03-0.15	3.6-6.0	Low-------	0.10			
	48-80	13-36	1.50-1.80	0.2-2.0	0.10-0.17	3.6-5.5	Low-------	0.20			
8---------------- Hydraquents	0-80	55-90	1.00-1.25	<0.06	0.15-0.20	7.9-8.4	High------	0.32	5	4	<1
9---------------- Lynne	0-5	1-5	1.10-1.50	6.0-20	0.08-0.15	3.6-5.5	Low-------	0.10	5	1	1-5
	5-21	1-5	1.40-1.65	6.0-20	0.03-0.08	3.6-5.5	Low-------	0.10			
	21-28	1-7	1.50-1.70	0.6-2.0	0.10-0.15	3.6-5.5	Low-------	0.15			
	28-33	1-5	1.30-1.70	6.0-20	0.05-0.10	3.6-5.5	Low-------	0.10			
	33-80	30-45	1.60-1.70	0.2-2.0	0.13-0.17	3.6-5.5	Moderate	0.32			
10--------------- Malabar	0-22	0-4	1.35-1.55	6.0-20	0.03-0.08	5.1-8.4	Low-------	0.10	5	1	1-2
	22-38	1-5	1.35-1.70	6.0-20	0.05-0.10	5.1-8.4	Low-------	0.10			
	38-48	1-5	1.40-1.70	6.0-20	0.02-0.05	5.1-8.4	Low-------	0.10			
	48-80	12-25	1.55-1.75	<0.2	0.10-0.15	5.1-8.4	Low-------	0.24			
11. Arents-Water											
12--------------- Neilhurst	0-80	1-2	1.50-1.65	>20	0.02-0.05	4.5-6.0	Low-------	0.10	5	1	0-1
13--------------- Samsula	0-31	---	0.10-0.50	6.0-20	0.20-0.25	<4.5	Low-------	----	2	2	>20
	31-80	1-14	1.35-1.55	6.0-20	0.02-0.05	3.6-5.5	Low-------	0.17			
14--------------- Sparr	0-8	1-5	1.20-1.50	6.0-20	0.08-0.12	3.6-6.5	Low-------	0.10	5	1	<3
	8-57	1-5	1.45-1.70	6.0-20	0.05-0.08	3.6-6.5	Low-------	0.10			
	57-80	15-32	1.55-1.80	0.6-2.0	0.10-0.15	3.6-6.5	Low-------	0.20			
15--------------- Tavares	0-8	0-4	1.25-1.65	>6.0	0.05-0.10	3.6-6.0	Low-------	0.10	5	1	.5-2
	8-80	0-4	1.40-1.70	>6.0	0.02-0.05	3.6-6.0	Low-------	0.10			
16. Urban land											

TABLE 16.--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	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
17:											
Smyrna----------	0-12	1-6	1.35-1.45	6.0-20	0.03-0.07	3.6-7.3	Low-------	0.10	5	1	1-5
	12-25	3-8	1.35-1.45	0.6-6.0	0.10-0.20	3.6-7.3	Low-------	0.15			
	25-42	1-6	1.50-1.65	6.0-20	0.03-0.07	4.5-5.5	Low-------	0.10			
	42-48	3-8	1.40-1.45	0.6-6.0	0.10-0.20	4.5-5.5	Low-------	0.15			
	48-80	1-6	1.40-1.65	6.0-20	0.03-0.07	4.5-5.5	Low-------	0.10			
Myakka----------	0-25	1-3	1.25-1.45	6.0-20	0.05-0.15	3.6-6.5	Low-------	0.10	5	1	2-5
	25-36	1-8	1.45-1.60	0.6-6.0	0.10-0.20	3.6-6.5	Low-------	0.15			
	36-80	0-2	1.48-1.70	6.0-20	0.02-0.10	3.6-6.5	Low-------	0.10			
19--------------- Floridana	0-15	3-10	1.40-1.50	6.0-20	0.10-0.20	4.5-8.4	Low-------	0.10	5	8	6-15
	15-28	1-7	1.50-1.55	6.0-20	0.05-0.10	4.5-8.4	Low-------	0.10			
	28-80	15-30	1.60-1.70	<0.2	0.10-0.20	4.5-8.4	Low-------	0.24			
20--------------- Fort Meade	0-25	3-13	1.15-1.55	6.0-20	0.08-0.15	5.1-7.3	Low-------	0.15	5	1	1-5
	25-80	3-13	1.20-1.65	6.0-20	0.06-0.10	4.5-6.0	Low-------	0.15			
21--------------- Immokalee	0-7	1-5	1.20-1.50	6.0-20	0.05-0.10	3.6-6.0	Low-------	0.10	5	1	1-2
	7-39	1-5	1.45-1.70	6.0-20	0.02-0.05	3.6-6.0	Low-------	0.10			
	39-58	2-7	1.30-1.70	0.6-2.0	0.10-0.25	3.6-6.0	Low-------	0.15			
	58-66	1-5	1.40-1.70	6.0-20	0.02-0.05	3.6-6.0	Low-------	0.10			
	66-80	2-7	1.30-1.60	0.6-2.0	0.10-0.25	3.6-6.0	Low-------	0.10			
22--------------- Pomello	0-48	<2	1.35-1.65	>20	0.02-0.05	4.5-6.0	Low-------	0.10	5	1	<1
	48-63	<2	1.45-1.60	2.0-6.0	0.10-0.30	4.5-6.0	Low-------	0.15			
	63-80	<2	1.35-1.65	6.0-20	0.02-0.05	4.5-6.0	Low-------	0.10			
23--------------- Ona	0-10	1-7	1.40-1.55	6.0-20	0.10-0.15	3.6-6.0	Low-------	0.10	5	1	1-5
	10-19	3-8	1.45-1.65	0.6-2.0	0.10-0.15	3.6-6.0	Low-------	0.15			
	19-50	1-4	1.50-1.65	6.0-20	0.03-0.08	3.6-6.0	Low-------	0.10			
	50-80	3-8	1.50-1.65	0.6-2.0	0.10-0.15	3.6-6.0	Low-------	0.15			
24--------------- Nittaw	0-6	13-30	1.50-1.65	0.6-6.0	0.10-0.15	5.6-7.3	Low-------	0.24	5	5	0-20
	6-75	35-60	1.35-1.55	0.06-0.2	0.15-0.18	5.6-8.4	High------	0.32			
	75-80	1-20	1.45-1.70	6.0-20	0.05-0.10	6.6-8.4	Low-------	0.20			
25:											
Placid----------	0-18	<10	1.20-1.40	6.0-20	0.15-0.20	3.6-5.5	Low-------	0.10	5	8	2-10
	18-80	<10	1.30-1.60	6.0-20	0.05-0.08	3.6-5.5	Low-------	0.10			
Myakka----------	0-25	1-3	1.25-1.55	6.0-20	0.05-0.15	3.6-6.5	Low-------	0.10	5	8	2-7
	25-36	2-8	1.35-1.60	0.6-6.0	0.10-0.20	3.6-6.5	Low-------	0.15			
	36-80	0-2	1.45-1.60	6.0-20	0.02-0.10	3.6-6.5	Low-------	0.10			
26--------------- Lochloosa	0-36	2-12	1.35-1.65	2.0-20	0.05-0.20	4.5-5.5	Low-------	0.10	5	1	1-4
	36-80	15-35	1.55-1.70	0.06-0.2	0.12-0.15	4.5-5.5	Low-------	0.28			
27--------------- Kendrick	0-29	1-7	1.25-1.50	6.0-20	0.05-0.07	4.5-6.0	Low-------	0.10	5	1	<2
	29-34	15-25	1.55-1.70	0.6-6.0	0.10-0.15	4.5-6.0	Low-------	0.24			
	34-64	20-40	1.55-1.75	0.06-2.0	0.12-0.20	4.5-6.0	Low-------	0.32			
	64-80	15-25	1.55-1.75	0.06-0.60	0.12-0.15	4.5-6.0	Low-------	0.32			
29--------------- St. Lucie	0-3	0-1	1.50-1.60	>20	0.02-0.05	3.6-7.3	Low-------	0.10	5	1	0-1
	3-80	0-1	1.50-1.60	>20	0.02-0.03	3.6-7.3	Low-------	0.10			
30--------------- Pompano	0-80	0-5	1.30-1.65	6.0-20	0.02-0.05	4.5-7.8	Low-------	0.10	5	1	1-5
31--------------- Adamsville	0-6	1-8	1.35-1.65	6.0-20	0.05-0.10	4.5-7.8	Low-------	0.10	5	1	<2
	6-80	1-7	1.35-1.65	6.0-20	0.03-0.08	4.5-7.8	Low-------	0.10			

TABLE 16.--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	Shrink- swell potential	Erosion factors		Wind erodi- bility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
32---------------	0-30	1-5	0.15-0.40	6.0-20	0.30-0.50	3.6-4.4	Low--------	----	---	2	30-90
Kaliga	30-75	15-30	1.30-1.70	0.06-0.2	0.10-0.15	4.5-7.3	Low--------	0.28			
	75-80	1-13	1.50-1.65	6.0-20	0.03-0.10	4.5-7.3	Low--------	0.10			
33---------------	0-41	1-7	1.35-1.60	6.0-20	0.03-0.10	5.1-7.3	Low--------	0.10	5	8	1-4
Holopaw	41-65	13-28	1.60-1.70	0.2-2.0	0.10-0.20	5.1-8.4	Low--------	0.20			
	65-80	7-13	1.50-1.60	6.0-20	0.05-0.10	5.1-8.4	Low--------	0.15			
34---------------	0-18	2-8	1.15-1.30	6.0-20	0.16-0.22	5.1-8.4	Low--------	0.10	5	8	9-15
Anclote	18-80	1-13	1.50-1.65	6.0-20	0.03-0.10	5.1-8.4	Low--------	0.10			
35---------------	0-75	---	0.20-0.40	6.0-20	0.30-0.50	3.6-4.4	Low--------	----	---	2	75-85
Hontoon	75-80	---	---	---	---	---	-----------	----			
36---------------	0-7	1-6	1.15-1.30	6.0-20	0.15-0.20	3.6-7.3	Low--------	0.10	5	8	8-20
Basinger	7-28	0-4	1.40-1.55	6.0-20	0.05-0.10	3.6-7.3	Low--------	0.10			
	28-48	1-3	1.40-1.65	6.0-20	0.10-0.15	3.6-7.3	Low--------	0.10			
	48-80	1-3	1.50-1.70	6.0-20	0.05-0.10	3.6-7.3	Low--------	0.10			
37---------------	0-18	0-10	1.20-1.40	6.0-20	0.15-0.20	3.6-5.5	Low--------	0.10	5	1	2-10
Placid	18-80	0-10	1.30-1.60	6.0-20	0.05-0.08	3.6-5.5	Low--------	0.10			
38---------------	0-6	1-6	1.40-1.55	6.0-20	0.05-0.10	3.6-6.5	Low--------	0.10	5	1	1-2
Electra	6-42	1-6	1.45-1.70	6.0-20	0.02-0.07	3.6-6.5	Low--------	0.10			
	42-55	1-6	1.50-1.70	0.6-2.0	0.10-0.15	3.6-5.5	Low--------	0.15			
	55-80	18-38	1.60-1.75	<0.2	0.10-0.15	3.6-5.5	Low--------	0.32			
39.											
Arents											
40---------------	0-7	<2	1.25-1.45	6.0-20	0.08-0.15	3.6-5.5	Low--------	0.10	5	1	1-3
Wauchula	7-18	<2	1.45-1.60	6.0-20	0.02-0.10	3.6-5.5	Low--------	0.10			
	18-26	2-8	1.45-1.60	0.2-6.0	0.15-0.25	3.6-5.5	Low--------	0.15			
	26-33	<2	1.45-1.65	2.0-6.0	0.08-0.15	4.5-5.5	Low--------	0.10			
	33-80	15-30	1.60-1.80	0.06-0.2	0.10-0.17	4.5-5.5	Low--------	0.20			
41---------------	0-12	1-4	1.30-1.50	6.0-20	0.10-0.15	3.6-5.5	Low--------	0.10	5	1	2-4
St. Johns	12-22	1-3	1.50-1.70	6.0-20	0.03-0.08	3.6-5.5	Low--------	0.10			
	22-65	2-6	1.50-1.58	0.2-2.0	0.10-0.30	3.6-5.5	Low--------	0.15			
	65-80	1-4	1.50-1.65	6.0-20	0.03-0.08	3.6-5.5	Low--------	0.10			
42---------------	0-22	1-3	1.40-1.55	6.0-20	0.02-0.05	5.1-7.8	Low--------	0.10	5	1	1-4
Felda	22-80	13-30	1.50-1.65	0.6-6.0	0.10-0.15	6.1-7.8	Low--------	0.24			
43---------------	0-36	<2	1.48-1.61	6.0-20	0.02-0.05	3.6-7.3	Low--------	0.10	5	1	1-2
Oldsmar	36-50	2-8	1.42-1.59	0.2-6.0	0.10-0.15	3.6-7.3	Low--------	0.15			
	50-80	15-30	1.60-1.69	<0.2	0.10-0.15	6.1-8.4	Low--------	0.24			
44---------------	0-14	2-8	1.35-1.45	6.0-20	0.05-0.08	4.5-6.5	Low--------	0.10	5	1	1-4
Paisley	14-80	45-65	1.25-1.50	0.06-0.2	0.15-0.18	5.6-8.4	High-------	0.28			
46---------------	0-7	1-3	1.25-1.55	>20	0.04-0.10	4.5-6.5	Low--------	0.10	5	1	.5-2
Astatula	7-80	1-3	1.45-1.60	>20	0.02-0.05	4.5-6.5	Low--------	0.10			
47---------------	0-7	1-5	1.35-1.55	6.0-20	0.10-0.15	4.5-7.3	Low--------	0.10	5	1	<3
Zolfo	7-71	1-5	1.30-1.60	6.0-20	0.03-0.10	4.5-7.3	Low--------	0.10			
	71-80	1-5	1.50-1.70	0.6-2.0	0.10-0.25	3.6-6.5	Low--------	0.15			
48---------------	0-12	10-20	1.15-1.30	2.0-6.0	0.15-0.20	5.1-7.3	Low--------	0.15	5	8	2-10
Chobee	12-55	10-30	1.40-1.45	<0.2	0.12-0.17	5.6-8.4	Low--------	0.15			
	55-80	0-15	1.45-1.50	2.0-6.0	0.10-0.15	5.6-7.8	Low--------	0.15			

TABLE 16.--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	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
49:											
Adamsville------	0-6	1-8	1.35-1.65	6.0-20	0.05-0.10	4.5-7.8	Low--------	0.10	5	1	<2
	6-80	1-7	1.35-1.65	6.0-20	0.03-0.08	4.5-7.8	Low--------	0.10			
Urban land.											
50:											
Candler---------	0-63	<3	1.35-1.55	6.0-20	0.04-0.08	4.5-6.0	Low--------	0.10	5	1	.5-2
	63-80	<3	1.50-1.65	6.0-20	0.02-0.06	4.5-6.0	Low--------	0.10			
Urban land.											
51:											
Pomona----------	0-6	1-6	1.10-1.50	6.0->20	0.05-0.10	3.6-5.5	Low--------	0.10	5	1	1-2
	6-21	<6	1.45-1.70	6.0-20	0.03-0.08	3.6-5.5	Low--------	0.10			
	21-26	2-7	1.30-1.60	0.6-20	0.10-0.20	3.6-5.5	Low--------	0.15			
	26-48	1-6	1.40-1.65	2.0-20	0.03-0.15	3.6-6.0	Low--------	0.10			
	48-80	13-36	1.50-1.80	0.2-2.0	0.10-0.17	3.6-5.5	Low--------	0.20			
Urban land.											
53:											
Myakka----------	0-25	1-3	1.25-1.55	6.0-20	0.05-0.15	3.6-6.5	Low--------	0.10	5	1	1-5
	25-36	1-8	1.35-1.60	0.6-6.0	0.10-0.20	3.6-6.5	Low--------	0.15			
	36-80	0-2	1.48-1.70	6.0-20	0.02-0.10	3.6-6.5	Low--------	0.10			
Immokalee-------	0-7	1-5	1.20-1.50	6.0-20	0.05-0.10	3.6-6.0	Low--------	0.10	5	1	1-2
	7-39	1-5	1.45-1.70	6.0-20	0.02-0.05	3.6-6.0	Low--------	0.10			
	39-58	2-7	1.30-1.70	0.6-2.0	0.10-0.25	3.6-6.0	Low--------	0.15			
	58-66	1-5	1.40-1.70	6.0-20	0.02-0.05	3.6-6.0	Low--------	0.10			
	66-80	2-7	1.30-1.60	0.6-2.0	0.10-0.25	3.6-6.0	Low--------	0.15			
Urban land.											
54:											
Pomello---------	0-48	<2	1.35-1.65	>20	0.02-0.05	4.5-6.0	Low--------	0.10	5	1	<1
	48-63	<2	1.45-1.60	2.0-6.0	0.10-0.30	4.5-6.0	Low--------	0.15			
	63-80	<2	1.35-1.65	6.0-20	0.02-0.05	4.5-6.0	Low--------	0.10			
Urban land.											
55:											
Sparr-----------	0-8	1-5	1.20-1.50	6.0-20	0.08-0.12	3.6-6.5	Low--------	0.10	5	1	<3
	8-57	1-5	1.45-1.70	6.0-20	0.05-0.08	3.6-6.5	Low--------	0.10			
	57-80	15-32	1.55-1.80	0.6-2.0	0.10-0.15	3.6-6.5	Low--------	0.20			
Urban land.											
57--------------- Haplaquents	0-80	60-85	1.25-1.55	<0.06	0.15-0.20	5.6-7.3	High-------	0.32	1	4	<1
58. Udorthents											
59:											
Arents----------	0-80	1-10	1.35-1.55	6.0-20	0.02-0.08	6.6-8.4	Low--------	0.10	5	2	<.5
Urban land.											
60. Arents											

TABLE 16.--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	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
61:											
Arents----------	0-30	1-10	1.35-1.55	6.0-20	0.02-0.10	5.6-7.3	Low--------	0.10	5	2	---
	30-65	---	0.20-0.40	6.0-20	0.30-0.50	5.1-7.3	Low--------	0.10			
	65-80	1-5	1.35-1.55	6.0-20	0.02-0.10	5.1-7.3	Low--------	0.10			
Urban land.											
62--------------- Wabasso	0-7	1-5	1.25-1.50	6.0-20	0.03-0.08	3.6-6.5	Low--------	0.10	5	1	1-4
	7-22	0-5	1.30-1.70	6.0-20	0.02-0.05	3.6-6.5	Low--------	0.10			
	22-30	1-12	1.50-1.75	0.6-2.0	0.10-0.15	4.5-7.3	Low--------	0.15			
	30-35	2-5	1.40-1.70	6.0-20	0.02-0.05	5.1-8.4	Low--------	0.10			
	35-80	12-30	1.60-1.85	<0.2	0.10-0.15	5.1-8.4	Low--------	0.24			
63:											
Tavares---------	0-8	0-4	1.25-1.65	>6.0	0.05-0.10	3.6-6.0	Low--------	0.10	5	1	.5-2
	8-80	0-4	1.40-1.70	>6.0	0.02-0.05	3.6-6.0	Low--------	0.10			
Urban land.											
64:											
Neilhurst-------	0-80	1-2	1.50-1.65	>20	0.02-0.05	4.5-6.0	Low--------	0.10	5	1	0-1
Urban land.											
66:											
Fort Meade------	0-25	3-13	1.15-1.55	6.0-20	0.08-0.15	5.1-7.3	Low--------	0.15	5	1	1-5
	25-80	3-13	1.20-1.65	6.0-20	0.06-0.10	4.5-6.0	Low--------	0.15			
Urban land.											
67--------------- Bradenton	0-4	1-6	1.30-1.50	6.0-20	0.08-0.12	5.6-7.3	Low--------	0.10	5	1	2-8
	4-12	1-6	1.50-1.70	6.0-20	0.03-0.07	5.6-7.3	Low--------	0.20			
	12-22	10-18	1.55-1.70	0.6-2.0	0.10-0.15	6.1-8.4	Low--------	0.24			
	22-80	1-18	1.55-1.70	0.6-6.0	0.03-0.10	7.4-8.4	Low--------	0.24			
68. Arents											
70--------------- Duette	0-7	<2	1.30-1.55	>20	0.03-0.06	4.5-6.5	Low--------	0.10	5	1	<1
	7-59	<2	1.40-1.70	>20	0.02-0.05	4.5-6.5	Low--------	0.10			
	59-80	1-5	1.45-1.60	2.0-6.0	0.10-0.15	4.5-6.5	Low--------	0.10			
72:											
Bradenton-------	0-6	1-6	1.30-1.50	6.0-20	0.08-0.12	5.1-7.3	Low--------	0.10	5	1	2-8
	6-12	1-6	1.50-1.70	6.0-20	0.03-0.07	5.1-7.3	Low--------	0.20			
	12-21	10-18	1.55-1.70	0.6-2.0	0.10-0.15	6.1-8.4	Low--------	0.24			
	21-58	1-18	1.55-1.70	0.6-6.0	0.03-0.10	7.4-8.4	Low--------	0.24			
	58-80	8-30	1.55-1.70	0.06-0.6	0.10-0.20	7.4-8.4	Low--------	0.24			
Felda-----------	0-22	1-3	1.40-1.55	6.0-20	0.02-0.05	5.1-7.8	Low--------	0.10	5	1	1-4
	22-35	13-30	1.50-1.65	0.6-6.0	0.10-0.15	6.1-7.8	Low--------	0.24			
	35-80	1-10	1.50-1.65	6.0-20	0.02-0.05	6.1-7.8	Low--------	0.10			
Chobee----------	0-12	7-20	1.45-1.50	2.0-6.0	0.10-0.15	6.1-7.3	Low--------	0.15	5	3	2-7
	12-32	20-35	1.55-1.75	<0.2	0.12-0.17	7.4-8.4	Moderate	0.32			
	32-80	7-20	1.60-1.75	0.2-6.0	0.06-0.10	7.4-8.4	Low--------	0.20			
73. Gypsum land											

TABLE 16.--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	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
74---------------- Narcoossee	0-5	2-6	1.25-1.45	6.0-20	0.03-0.08	3.6-6.0	Low--------	0.10	5	1	1-5
	5-17	1-4	1.50-1.65	6.0-20	0.02-0.05	3.6-6.0	Low--------	0.10			
	17-22	2-6	1.40-1.60	2.0-6.0	0.05-0.08	3.6-6.0	Low--------	0.10			
	22-80	1-4	1.50-1.70	6.0-20	0.02-0.05	3.6-6.0	Low--------	0.10			
75---------------- Valkaria	0-5	1-3	1.35-1.50	6.0-20	0.05-0.10	4.5-7.3	Low--------	0.10	5	1	1-4
	5-26	0-2	1.45-1.60	6.0-20	0.03-0.08	4.5-7.3	Low--------	0.10			
	26-46	2-5	1.45-1.60	6.0-20	0.05-0.10	4.5-7.3	Low--------	0.10			
	46-80	1-5	1.45-1.60	6.0-20	0.03-0.08	5.1-8.4	Low--------	0.10			
76---------------- Millhopper	0-63	2-8	1.45-1.67	6.0-20	0.05-0.10	4.5-6.5	Low--------	0.10	5	1	.5-2
	63-80	12-28	1.60-1.90	0.06-2.0	0.08-0.15	4.5-6.0	Low--------	0.28			
77---------------- Satellite	0-6	1-3	1.10-1.45	>20	0.02-0.10	4.5-7.8	Low--------	0.10	5	1	.5-2
	6-80	0-2	1.35-1.55	>20	0.02-0.05	4.5-7.8	Low--------	0.10			
78---------------- Paisley	0-18	2-8	1.45-1.55	2.0-20	0.10-0.15	5.1-6.5	Low--------	0.10	5	2	1-4
	18-22	15-35	1.60-1.70	0.06-2.0	0.13-0.18	5.1-6.5	High-------	0.28			
	22-60	40-60	1.25-1.55	0.06-2.0	0.15-0.18	6.1-7.3	High-------	0.28			
80---------------- Chobee	0-12	7-20	1.45-1.50	2.0-6.0	0.10-0.15	6.1-7.3	Low--------	0.15	5	3	2-7
	12-32	20-35	1.55-1.75	<0.2	0.12-0.17	7.4-8.4	Moderate	0.32			
	32-80	7-20	1.60-1.75	0.2-6.0	0.06-0.10	7.4-8.4	Low--------	0.20			
81---------------- St. Augustine	0-2	0-2	1.30-1.40	6.0-20	0.02-0.05	6.1-8.4	Low--------	0.10	5	1	1-3
	2-80	4-12	1.40-1.55	2.0-20	0.05-0.10	6.1-8.4	Low--------	0.15			
82---------------- Felda	0-22	1-3	1.40-1.55	6.0-20	0.02-0.05	5.1-7.8	Low--------	0.10	5	1	1-4
	22-35	13-30	1.50-1.65	0.6-6.0	0.10-0.15	6.1-7.8	Low--------	0.24			
	35-80	1-10	1.50-1.65	6.0-20	0.02-0.05	6.1-7.8	Low--------	0.10			
83---------------- Archbold	0-4	0-1	1.40-1.60	>20	0.03-0.05	3.6-5.5	Low--------	0.10	5	1	<1
	4-80	0-1	1.45-1.60	>20	0.02-0.03	3.6-5.5	Low--------	0.10			
85---------------- Winder	0-16	1-6	1.40-1.65	6.0-20	0.03-0.08	5.6-7.8	Low--------	0.10	5	8	.1-2
	16-50	20-30	1.60-1.70	<0.2	0.10-0.15	6.6-8.4	Low--------	0.24			
	50-80	15-30	1.50-1.70	<0.2	0.06-0.12	7.4-8.4	Low--------	0.24			
86---------------- Felda	0-6	1-3	1.40-1.55	6.0-20	0.05-0.10	5.1-7.8	Low--------	0.10	4	8	1-4
	6-27	1-3	1.45-1.55	6.0-20	0.02-0.05	5.1-7.8	Low--------	0.10			
	27-45	13-30	1.50-1.60	0.6-6.0	0.10-0.15	6.1-7.8	Low--------	0.24			
	45-80	1-10	1.50-1.65	6.0-20	0.02-0.05	6.1-8.4	Low--------	0.17			
87---------------- Basinger	0-19	0-4	1.40-1.55	6.0-20	0.03-0.07	3.6-8.4	Low--------	0.10	5	1	.5-2
	19-39	0-4	1.40-1.55	6.0-20	0.05-0.10	3.6-7.3	Low--------	0.10			
	39-80	1-6	1.40-1.65	6.0-20	0.10-0.15	3.6-7.3	Low--------	0.10			

TABLE 17.--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		
2-------------- Apopka	A	None-------	---	---	>6.0	---	---	---	---	Moderate	High.
3, 4----------- Candler	A	None-------	---	---	>6.0	---	---	---	---	Low------	High.
5-------------- EauGallie	B/D	None-------	---	---	0-1.0	Apparent	Jun-Oct	---	---	High-----	Moderate
6-------------- Eaton	D	None-------	---	---	+2-0	Apparent	Jun-Feb	---	---	High-----	High.
7-------------- Pomona	B/D	None-------	---	---	0-1.0	Apparent	Jun-Oct	---	---	High-----	High.
8-------------- Hydraquents	D	None-------	---	---	+2-0	Apparent	Jan-Dec	---	---	High-----	Low.
9-------------- Lynne	B/D	None-------	---	---	0-1.0	Apparent	Jun-Oct	---	---	High-----	High.
10------------- Malabar	B/D	None-------	---	---	0-1.0	Apparent	Jun-Nov	---	---	High-----	Low.
11. Arents-Water											
12------------- Neilhurst	A	None-------	---	---	>6.0	---	---	---	---	Low------	High.
13------------- Samsula	B/D	None-------	---	---	+2-0	Apparent	Jan-Dec	16-20	30-36	High-----	High.
14------------- Sparr	C	None-------	---	---	1.5-3.5	Apparent	Jul-Oct	---	---	Moderate	High.
15------------- Tavares	A	None-------	---	---	3.5-6.0	Apparent	Jun-Dec	---	---	Low------	High.
16. Urban land											
17:											
Smyrna---------	B/D	None-------	---	---	0-1.0	Apparent	Jun-Oct	---	---	High-----	High.
Myakka---------	B/D	None-------	---	---	0-1.0	Apparent	Jun-Oct	---	---	High-----	High.
19------------- Floridana	D	None-------	---	---	+2-0	Apparent	Jun-Feb	---	---	Moderate	Low.
20------------- Fort Meade	A	None-------	---	---	>6.0	---	---	---	---	Low------	High.
21------------- Immokalee	B/D	None-------	---	---	0-1.0	Apparent	Jun-Oct	---	---	High-----	High.

TABLE 17.--SOIL AND WATER FEATURES--Continued

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		
22------------- Pomello	C	None--------	---	---	2.0-3.5	Apparent	Jul-Nov	---	---	Low-------	High.
23------------- Ona	B/D	None--------	---	---	0-1.0	Apparent	Jun-Oct	---	---	High------	High.
24------------- Nittaw	D	Frequent----	Very long.	Jun-Sep	0-1.0	Apparent	Jun-Nov	---	---	High------	High.
25:											
Placid---------	D	None--------	---	---	+2-0	Apparent	Jun-Mar	---	---	High------	High.
Myakka---------	D	None--------	---	---	+2-0	Apparent	Jun-Feb	---	---	High------	High.
26------------- Lochloosa	C	None--------	---	---	2.5-5.0	Apparent	Jul-Oct	---	---	High------	High.
27------------- Kendrick	A	None--------	---	---	>6.0	---	---	---	---	Moderate	High.
29------------- St. Lucie	A	None--------	---	---	>6.0	---	---	---	---	Low-------	Moderate.
30------------- Pompano	B/D	None--------	---	---	0-1.0	Apparent	Jun-Nov	---	---	High------	Moderate.
31------------- Adamsville	C	None--------	---	---	2.0-3.5	Apparent	Jun-Nov	---	---	Low-------	Moderate.
32------------- Kaliga	B/D	None--------	---	---	+1-0	Apparent	Jan-Dec	---	24	High------	High.
33------------- Holopaw	D	None--------	---	---	+2-0	Apparent	Jun-Feb	---	---	High------	Moderate.
34------------- Anclote	D	None--------	---	---	+2-0	Apparent	Jun-Mar	---	---	High------	Moderate.
35------------- Hontoon	B/D	None--------	---	---	+2-0	Apparent	Jan-Dec	16-24	>52	High------	High.
36------------- Basinger	D	None--------	---	---	+2-0	Apparent	Jun-Feb	---	---	High------	Moderate.
37------------- Placid	D	Frequent----	Brief	Jun-Nov	0-1.0	Apparent	Jun-Feb	---	---	High------	High.
38------------- Electra	C	None--------	---	---	2.0-3.5	Apparent	Jul-Oct	---	---	Low-------	High.
39. Arents											
40------------- Wauchula	B/D	None--------	---	---	0-1.0	Apparent	Jun-Oct	---	---	High------	High.
41------------- St. Johns	B/D	None--------	---	---	0-1.0	Apparent	Jun-Apr	---	---	High------	High.
42------------- Felda	B/D	None--------	---	---	0-1.0	Apparent	Jun-Feb	---	---	High------	Moderate.

TABLE 17.--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		
43------------- Oldsmar	B/D	None-------	---	---	0-1.0	Apparent	Jun-Oct	---	---	Moderate	High.
44------------- Paisley	D	None-------	---	---	0-1.0	Apparent	Jun-Nov	---	---	High-----	Moderate.
46------------- Astatula	A	None-------	---	---	>6.0	---	---	---	---	Low------	High.
47------------- Zolfo	C	None-------	---	---	2.0-3.5	Apparent	Jun-Nov	---	---	Low------	Moderate.
48------------- Chobee	D	None-------	---	---	+2.-0	Apparent	Jun-Feb	---	---	High-----	High.
49:											
Adamsville----	C	None-------	---	---	2.0-3.5	Apparent	Jun-Nov	---	---	Low------	Moderate.
Urban land.											
50:											
Candler-------	A	None-------	---	---	>6.0	---	---	---	---	Low------	High.
Urban land.											
51:											
Pomona--------	B/D	None-------	---	---	0-1.0	Apparent	Jun-Oct	---	---	High-----	High.
Urban land.											
53:											
Myakka--------	B/D	None-------	---	---	0-1.0	Apparent	Jun-Oct	---	---	High-----	High.
Immokalee-----	B/D	None-------	---	---	0-1.0	Apparent	Jun-Oct	---	---	High-----	High.
Urban land.											
54:											
Pomello-------	C	None-------	---	---	2.0-3.5	Apparent	Jul-Nov	---	---	Low------	High.
Urban land.											
55:											
Sparr---------	C	None-------	---	---	1.5-3.5	Apparent	Jul-Oct	---	---	Moderate	High.
Urban land.											
57------------- Haplaquents	D	None-------	---	---	+1-0	Apparent	Jan-Dec	---	---	Moderate	Low.
58. Udorthents											
59:											
Arents--------	C	None-------	---	---	1.5-3.0	Apparent	Jun-Nov	---	---	High-----	Moderate.
Urban land.											
60. Arents											

TABLE 17.--SOIL AND WATER FEATURES--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table			Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Initial	Total	Uncoated steel	Concrete
					Ft			In	In		
61:											
Arents	B	None	---	---	2.0-3.0	Apparent	Jun-Nov	---	---	High	High.
Urban land.											
62 Wabasso	B/D	None	---	---	0-1.0	Apparent	Jun-Oct	---	---	Moderate	High.
63:											
Tavares	A	None	---	---	3.5-6.0	Apparent	Jun-Dec	---	---	Low	High.
Urban land.											
64:											
Neilhurst	A	None	---	---	>6.0	---	---	---	---	Low	High.
Urban land.											
66:											
Fort Meade	A	None	---	---	>6.0	---	---	---	---	Low	High.
Urban land.											
67 Bradenton	B/D	None	---	---	0-1.0	Apparent	Jun-Oct	---	---	High	Low.
68. Arents											
70 Duette	A	None	---	---	4.0-6.0	Apparent	Jun-Oct	---	---	Low	High.
72:											
Bradenton	D	Frequent	Brief	Jun-Nov	0-1.0	Apparent	Jun-Dec	---	---	High	Low.
Felda	B/D	Frequent	Brief	Jul-Feb	0-1.0	Apparent	Jun-Feb	---	---	High	Moderate.
Chobee	B/D	Frequent	Very long.	Jun-Feb	0-1.0	Apparent	Jun-Mar	---	---	Moderate	Low.
73. Gypsum land											
74 Narcoossee	C	None	---	---	2.0-3.5	Apparent	Jun-Nov	---	---	Moderate	High.
75 Valkaria	B/D	None	---	---	0-1.0	Apparent	Jun-Feb	---	---	High	Moderate.
76 Millhopper	A	None	---	---	3.5-6.0	Perched	Jul-Dec	---	---	Low	Moderate.
77 Satellite	C	None	---	---	1.0-3.5	Apparent	Jun-Nov	---	---	Low	Moderate.
78 Paisley	D	Rare	---	---	0-1.0	Apparent	Jun-Nov	---	---	High	Moderate.
80 Chobee	B/D	Frequent	Very long.	Jun-Feb	0-1.0	Apparent	Jun-Feb	---	---	Moderate	Low.

TABLE 17.--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		
81------------- St. Augustine	C	None--------	---	---	1.5-3.0	Apparent	Jul-Oct	---	---	High-----	High.
82------------- Felda	B/D	Frequent---	Brief	Jul-Feb	0-1.0	Apparent	Jul-Mar	---	---	High-----	Moderate.
83------------- Archbold	A	None--------	---	---	3.5-6.0	Apparent	Jun-Nov	---	---	Low------	Moderate.
85------------- Winder	D	None--------	---	---	+2-0	Apparent	Jun-Dec	---	---	High-----	Low.
86------------- Felda	D	None--------	---	---	+2-0	Apparent	Jun-Dec	---	---	High-----	High.
87------------- Basinger	B/D	None--------	---	---	0-1.0	Apparent	Jun-Feb	---	---	High-----	Moderate.

TABLE 18.--DEPTH TO WATER TABLE IN SELECTED SOILS

[Readings were taken bimonthly. Measurements of water table depths are in inches. The symbol > means more than. Absence of an entry indicates that readings were not taken that month]

Soil name and year	January	February	March	April	May	June	July	August	September	October	November	December
Immokalee sand:												
1977	---	---	---	---	---	---	-- - 19	10 - 17	11 - 11	21 - 27	21 - 30	24 - 15
1978	21 - 21	20 - 13	8 - 22	31 - 32	40 - 16	28 - 10	37 - 27	36 - 19	22 - 27	34 - 40	44 - 47	50 - 53
1979	34 - 27	31 - 31	27 - 35	41 - 46	41 - 14	22 - 21	25 - 23	12 - 9	8 - 12	11 - 8	22 - 24	28 - 32
1980	33 - 27	28 - 20	21 - 28	27 - 23	34 - 35	36 - 36	35 - 32	41 - 42	33 - 38	45 - 50	57 - 58	46 - 49
1981	51 - 54	54 - 42	45 - 51	53 - 57	>80 ->80	>80 ->80	>80 - 39	34 - 42	19 - 22	24 - 31	39 - 44	45 - 48
1982	50 - 50	53 - 54	54 - 52	44 - 42	52 - 43	37 - 10	11 - 12	6 - 3	19 - 23	17 - 23	28 - 33	38 - 40
1983	45 - 39	8 - 13	4 - 5	11 - 23	30 - 38	20 - 29	26 - 24	29 - 12	23 - 17	28 - 24	27 - 32	29 - 11
1984	12 - 14	20 - 28	17 - 17	30 - 34	30 - 36	42 - 26	14 - 15	16 - 24	31 - 33	38 - 43	46 - 49	50 - 52
1985	53 - 53	54 - 54	53 - 55	52 - 53	>80 ->80	>80 ->80	44 - 27	6 - 2	10 - 16	23 - 30	33 - 36	38 - 39
1986	35 - 40	30 - 33	38 - 29	42 - 38	42 - 48	51 - 34	42 - 39	38 - 30	12 - 24	21 - 31	29 - --	---
Zolfo fine sand:												
1977	---	---	---	---	---	---	-- - 58	58 - 53	47 - 38	47 - 58	64 - 67	68 - 69
1978	62 - 55	58 - 40	33 - 47	54 - 63	68 - 64	67 - 58	64 - 38	26 - 40	45 - 54	53 - 62	66 - 68	69 - 69
1979	54 - 36	44 - 51	22 - 40	52 - 62	64 - 20	32 - 41	52 - 29	46 - 27	24 - 22	22 - 31	44 - 49	57 - 59
1980	61 - 54	56 - 51	50 - 53	54 - 56	64 - 64	64 - 61	60 - 61	59 - 51	50 - 48	46 - 60	72 - 71	58 - 63
1981	66 - 68	71 - 52	41 - 65	68 - 73	>88 ->80	76 - 76	71 - 76	76 - 67	57 - 45	39 - 49	48 - 56	62 - 58
1982	64 - 58	62 - 53	59 - 53	48 - 59	68 - 27	53 - 16	26 - 36	42 - 42	52 - 52	33 - 43	43 - 50	55 - 57
1983	54 - 56	15 - 29	3 - 10	25 - 39	49 - 60	32 - 41	14 - 33	33 - 32	45 - 31	37 - 38	44 - 52	51 - 30
1984	27 - 26	31 - 26	27 - 32	33 - 45	50 - 59	61 - 61	49 - 47	44 - 49	61 - 65	65 - 65	73 ->80	>80 ->80
1985	76 - 75	74 ->80	>80 ->80	>80 ->80	>80 ->80	>80 ->80	>80 ->80	>80 ->80	52 - 58	66 ->80	73 ->80	71 - 74
1986	>80 ->80	67 ->80	>80 - 65	>80 ->80	>80 ->80	>80 ->80	>80 ->80	66 - 57	46 - 57	47 - 56	57 - --	---

TABLE 19.--PHYSICAL ANALYSES OF SELECTED SOILS

[Absence of an entry indicates that data were not available]

Soil name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very coarse (2-1 mm)	Coarse (1-0.5 mm)	Medium (0.5-0.25 mm)	Fine (0.25-0.1 mm)	Very fine (0.1-0.05 mm)	Total (2-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)	Hydraulic conductivity*	Bulk density (field moist)*	Water content: 1/10 bar	1/3 bar	15 bar
	Cm		Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Cm/hr	g/cm3	Pct (wt)		
Apopka fine sand:															
S77FL-105-04-1	0-18	Ap	0.1	1.5	26.0	60.3	7.3	95.2	2.7	2.1	8.9	1.60	9.4	6.0	1.7
-2	18-53	E1	0.1	1.5	26.9	60.8	6.8	96.1	2.3	1.6	39.4	1.56	5.7	4.0	1.3
-3	53-89	E2	0.1	1.8	26.9	61.9	5.8	96.5	1.9	1.6	58.1	1.44	10.3	8.4	0.8
-4	89-130	E3	0.0	1.5	27.0	61.6	6.0	96.1	1.9	2.0	54.2	1.51	4.5	2.8	0.7
-5	130-155	Bt1	0.1	1.5	19.8	53.5	5.4	80.3	2.1	17.6	0.9	1.63	15.3	12.8	7.9
-6	155-203	Bt2	0.0	1.3	15.2	33.6	4.3	54.4	4.9	40.7	0.3	1.67	21.3	19.8	15.1
Archbold sand:															
S83FL-105-23-1	0-10	A	0.0	8.8	63.7	25.3	1.3	99.1	0.7	0.2	122.0	1.44	3.9	3.2	1.1
-2	10-68	C	0.0	8.3	60.1	29.4	1.4	99.2	0.6	0.2	118.0	1.44	2.4	1.8	0.6
-3	68-132	C	0.0	8.3	56.4	32.2	2.0	98.9	0.6	0.5	101.0	1.49	2.0	1.4	0.4
-4	132-203	C	0.0	7.7	53.9	35.6	1.9	99.1	0.2	0.7	121.0	1.49	2.0	1.3	0.6
Astatula sand:															
S83FL-105-21-1	0-18	A	0.2	5.8	42.5	48.1	2.1	98.7	0.0	1.3	62.5	1.52	3.6	2.5	0.5
-2	18-91	C1	0.1	5.1	41.2	50.3	1.9	98.6	0.7	0.7	66.4	1.55	3.2	2.2	0.4
-3	91-162	C1	0.2	6.5	43.1	47.2	2.1	99.1	0.4	0.5	73.0	1.49	2.7	1.8	0.3
-4	162-203	C2	0.2	7.6	45.8	44.1	1.7	99.4	0.1	0.5	80.9	1.51	2.0	1.2	0.2
Candler sand:															
S83FL-105-22-1	0-15	Ap	0.0	6.2	48.6	40.4	1.5	96.7	0.8	2.5	127.0	1.46	5.1	3.2	1.1
-2	15-107	E1	0.0	6.0	49.2	40.9	1.4	97.5	1.3	1.2	82.2	1.53	2.4	1.6	0.6
-3	107-160	E2	0.0	5.6	49.6	41.3	1.4	97.9	1.1	1.0	89.4	1.49	2.6	1.9	0.6
-4	160-203	E&Bt	0.0	4.5	48.6	43.1	1.2	97.4	0.8	1.8	79.5	1.50	3.3	2.6	0.9
Fort Meade sand:															
S78FL-105-07-1	0-20	Ap	0.2	3.3	28.3	45.4	12.8	90.0	5.2	4.8	6.7	1.49	13.2	9.2	5.7
-2	20-64	A	0.1	3.2	29.8	44.6	11.2	88.9	6.8	4.3	40.7	1.32	11.5	8.7	5.3
-3	64-89	C1	0.1	3.1	29.2	46.0	11.5	89.9	6.3	3.8	32.2	1.41	9.5	7.0	4.5
-4	89-147	C2	0.2	3.5	28.1	46.6	11.8	90.2	5.6	4.2	40.1	1.50	7.8	6.4	3.4
-5	147-206	C3	0.2	3.7	29.1	45.3	11.9	90.2	5.2	4.6	51.2	1.55	9.0	6.4	3.4
-6	206-254	2C	0.2	3.2	32.2	42.6	10.3	88.5	3.6	7.9	21.7	1.65	9.5	7.0	3.6
Immokalee sand:															
S81FL-105-09-1	0-18	Ap	0.0	9.1	57.1	30.9	1.4	98.5	1.1	0.4	34.9	1.35	8.1	6.2	2.0
-2	18-46	E1	0.1	8.0	53.9	34.6	2.2	98.7	0.6	0.7	51.3	1.58	3.2	2.6	0.6
-3	46-99	E2	0.1	7.7	52.3	35.7	2.6	98.4	1.0	0.6	42.7	1.62	2.5	1.7	0.3
-4	99-112	Bh1	0.0	7.3	44.3	33.0	3.7	88.3	9.9	1.8	3.3	1.35	27.9	22.8	2.8
-5	112-147	Bh2	0.0	6.8	46.3	37.3	3.7	94.1	4.5	1.4	3.8	1.57	15.7	11.8	2.6
-6	147-168	E'	0.1	8.3	47.3	39.4	2.2	97.3	2.0	0.7	10.7	1.64	5.5	3.0	0.3
-7	168-190	B'h1	0.0	7.5	43.0	43.1	2.6	96.2	2.4	1.4	5.9	1.67	7.1	4.4	0.7
-8	190-203	B'h2	0.0	7.6	43.9	34.8	3.1	89.4	6.3	4.3	2.5	1.56	13.8	9.7	1.9

See footnote at end of table.

TABLE 19.--PHYSICAL ANALYSES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very coarse (2-1 mm)	Coarse (1-0.5 mm)	Medium (0.5-0.25 mm)	Fine (0.25-0.1 mm)	Very fine (0.1-0.05 mm)	Total (2-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)	Hydraulic conductivity*	Bulk density (field moist)*	Water content: 1/10 bar	1/3 bar	15 bar
	Cm		Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Cm/hr	g/cm^3	Pct (wt)		
Kaliga muck:															
S83FL-105-18-1	0-23	Oap	---	---	---	---	---	---	---	---	26.3	0.38	148.1	120.7	25.7
-2	23-76	Oa	---	---	---	---	---	---	---	---	20.7	0.14	421.0	334.8	30.2
-3	76-140	Cg1	0.0	1.2	13.2	18.0	5.6	38.0	42.5	19.5	14.8	1.28	32.3	30.0	6.9
-4	140-190	Cg2	0.0	3.0	25.6	31.0	7.8	67.4	12.6	20.0	---	---	---	---	---
-5	190-203	Cg3	0.0	9.1	44.3	43.1	1.7	98.2	1.0	0.8	---	---	---	---	---
Lynne sand:															
S77FL-105-03-1	0-13	Ap	0.0	1.6	24.5	47.2	14.6	87.9	9.5	2.6	74.2	1.12	27.2	18.5	6.3
-2	13-28	E1	0.0	1.5	24.9	50.5	17.5	94.4	4.9	0.7	20.4	1.54	8.9	4.7	1.0
-3	28-53	E2	0.0	2.0	25.1	51.0	17.9	96.0	3.5	0.5	14.5	1.64	7.3	3.4	0.5
-4	53-71	Bh	0.1	2.2	19.9	49.2	16.5	87.8	6.8	5.4	1.4	1.66	17.9	12.7	4.0
-5	71-84	BE	0.1	2.2	21.2	49.8	18.3	91.5	5.5	3.0	8.2	1.67	13.2	7.4	2.4
-6	84-132	Btg1	0.0	0.9	13.7	28.2	8.6	51.4	3.1	45.5	1.2	1.30	37.3	34.7	23.5
-7	132-157	Btg2	0.0	0.8	13.8	28.2	8.8	51.6	2.9	45.5	0.0	1.67	21.6	20.9	16.2
-8	157-203	Btg3	0.0	0.9	12.8	32.7	9.5	55.9	3.1	41.0	0.0	1.69	22.3	21.3	17.9
Millhopper fine sand:															
S83FL-105-20-1	0-15	Ap	0.0	1.7	17.7	61.1	14.8	95.3	2.8	1.9	20.1	1.45	8.6	5.8	1.0
-2	15-48	E1	0.0	1.6	17.4	63.7	13.3	96.0	2.7	1.3	14.5	1.58	6.2	3.5	0.6
-3	48-96	E2	0.0	1.8	18.0	63.7	12.7	96.2	2.3	1.5	24.3	1.55	4.8	2.5	0.5
-4	96-160	E3	0.0	1.7	16.8	65.6	12.7	96.8	2.3	0.9	23.3	1.60	4.4	1.9	0.4
-5	160-173	Bt	0.0	1.6	14.8	51.2	12.0	79.6	4.2	16.2	4.1	1.64	11.5	9.3	4.3
-6	173-203	Btg	0.0	1.6	15.2	49.2	10.6	76.6	4.0	19.4	1.1	1.62	17.4	15.8	7.7
Myakka fine sand:															
S83FL-105-16-1	0-18	Ap	0.0	1.1	33.2	54.3	8.9	97.5	2.2	0.3	38.7	1.44	8.9	6.0	2.0
-2	18-64	E	0.0	1.3	32.5	55.1	9.3	98.2	1.2	0.6	27.9	1.53	4.0	2.8	0.2
-3	64-76	Bh1	0.0	1.0	30.1	53.6	9.2	93.9	2.6	4.4	12.8	1.37	19.0	15.6	4.2
-4	76-91	Bh2	0.0	1.1	29.2	53.9	8.7	92.9	2.5	4.6	9.0	1.52	11.0	8.5	2.5
-5	91-150	C	0.0	1.1	25.5	58.0	10.7	95.3	2.3	2.4	11.2	1.58	8.4	6.1	1.3
-6	150-203	C	0.0	1.2	27.6	55.9	9.3	94.0	2.9	3.1	9.5	1.60	7.7	5.4	1.2
Narcoossee sand:															
S83FL-105-24-1	0-13	A	0.0	1.6	40.7	46.0	6.3	94.6	2.6	2.8	49.3	1.25	14.4	11.2	4.7
-2	13-43	E	0.0	1.7	36.6	52.1	7.4	97.8	1.6	0.6	32.9	1.61	3.7	2.4	0.9
-3	43-48	Bh1	0.0	1.8	36.5	48.6	5.8	92.7	4.0	3.3	31.6	1.43	12.1	10.2	2.4
-4	48-56	Bh2	0.0	1.7	35.3	47.0	6.7	90.7	3.5	5.8	32.9	1.42	12.9	10.4	4.0
-5	56-76	BC	0.0	1.7	34.9	51.1	7.4	95.1	2.4	2.5	45.5	1.50	7.8	5.5	1.6
-6	76-122	C1	0.0	1.7	33.1	52.7	9.1	96.6	1.9	1.5	34.2	1.60	5.2	3.2	0.7
-7	122-203	C2	0.0	1.8	32.8	46.4	6.1	87.1	5.9	7.0	4.1	1.72	15.7	11.9	3.7

See footnote at end of table.

TABLE 19.--PHYSICAL ANALYSES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very coarse (2-1 mm)	Coarse (1-0.5 mm)	Medium (0.5-0.25 mm)	Fine (0.25-0.1 mm)	Very fine (0.1-0.05 mm)	Total (2-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)	Hydraulic conductivity*	Bulk density (field moist)*	Water content: 1/10 bar	1/3 bar	15 bar
	Cm		Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Cm/hr	g/cm^3	Pct (wt)		
Ona fine sand:															
S81FL-105-13-1	0-10	Ap	0.0	0.7	13.9	63.3	14.0	91.9	4.6	3.5	5.6	1.42	21.7	14.0	4.0
-2	10-25	A	0.0	0.6	14.3	62.8	13.9	91.6	6.2	2.2	4.3	1.50	11.9	7.7	1.6
-3	25-48	Bh	0.0	0.5	14.3	66.3	12.7	93.8	4.9	1.3	10.7	1.46	12.5	9.2	1.5
-4	48-61	BE	0.0	0.6	14.8	65.2	13.8	94.4	4.3	1.3	6.7	1.58	10.4	6.9	0.8
-5	61-94	E	0.0	0.4	15.2	65.6	14.4	95.6	3.0	1.4	11.2	1.66	8.7	4.6	0.5
-6	94-127	E	0.0	0.6	14.6	66.2	14.6	96.0	2.9	1.1	6.8	1.65	7.3	3.9	0.6
-7	127-190	B'h1	0.0	0.6	12.4	60.4	16.0	89.4	8.8	1.8	2.3	1.82	11.5	7.0	0.7
-8	190-203	B'h2	0.0	0.6	12.0	58.6	16.2	87.4	10.7	1.9	---	---	---	---	---
Pomona fine sand:															
S77FL-105-02-1	0-15	Ap	0.1	1.2	20.3	51.9	19.1	92.6	6.0	1.4	20.6	1.11	19.5	14.7	5.8
-2	15-30	E1	0.0	1.6	25.4	49.2	18.9	95.1	4.5	0.4	16.4	1.53	7.6	4.8	1.5
-3	30-53	E2	0.0	1.8	25.9	48.1	18.4	94.2	5.1	0.7	20.8	1.52	6.3	3.4	0.7
-4	53-66	Bh	0.0	1.5	19.1	47.2	18.1	85.9	8.9	5.2	5.9	1.36	19.2	14.6	4.9
-5	66-86	E'1	0.0	1.6	21.9	50.7	18.6	92.8	5.1	2.1	9.1	1.61	8.6	4.7	1.5
-6	86-122	E'2	0.0	1.5	21.1	50.1	21.5	94.2	4.6	1.2	1.3	1.70	8.0	3.0	0.5
-7	122-152	Btg1	0.1	1.2	17.8	41.8	18.9	79.8	5.9	14.3	0.7	1.76	16.9	15.7	5.7
-8	152-185	Btg2	0.0	1.6	17.6	36.5	14.6	70.3	4.7	25.0	0.0	1.75	18.0	16.8	9.0
-9	185-203	Cg	0.0	1.9	24.3	39.1	19.1	84.4	10.0	5.6	0.4	1.62	20.2	16.0	6.4
Samsula muck:															
S83FL-105-17-1	0-18	Oa1	---	---	---	---	---	---	---	---	18.4	0.24	224.9	193.6	33.6
-2	18-68	Oa2	---	---	---	---	---	---	---	---	19.1	0.12	664.3	588.6	25.7
-3	68-79	Oa3	---	---	---	---	---	---	---	---	13.1	0.14	572.6	468.6	23.3
-4	79-132	C	0.0	7.1	42.4	43.1	2.9	95.5	2.9	1.6	11.5	1.41	16.8	11.0	0.9
-5	132-203	Cg	0.0	7.4	42.9	43.6	2.5	96.4	1.7	1.9	---	---	---	---	---
Satellite sand:															
S83FL-105-14-1	0-15	Ap	0.0	5.3	60.3	30.3	2.5	98.4	0.5	1.1	62.4	1.34	8.7	6.6	3.1
-2	15-46	C1	0.0	4.1	56.5	34.6	3.3	98.5	0.8	0.7	94.4	1.54	3.0	2.1	0.3
-3	46-102	C2	0.0	5.0	60.4	31.2	2.4	99.0	0.5	0.5	131.5	1.52	2.7	2.0	0.2
-4	102-152	C2	0.0	4.8	58.4	33.1	2.5	98.8	0.7	0.5	---	---	---	---	---
-5	152-203	C3	0.0	5.2	59.7	31.9	2.1	98.9	1.0	0.1	---	---	---	---	---
Sparr sand:															
S77FL-105-05-1	0-20	Ap	0.1	5.2	41.2	43.3	4.8	94.6	3.9	1.5	72.6	1.45	7.2	4.9	1.8
-2	20-51	E1	0.1	6.6	44.5	41.1	2.8	95.1	3.2	1.7	47.3	1.54	5.9	3.9	0.9
-3	51-96	E2	0.2	4.8	39.4	46.0	5.0	95.4	2.8	1.8	81.8	1.46	4.1	3.1	0.9
-4	96-117	E3	0.2	6.0	40.3	44.7	4.3	95.5	2.9	1.6	81.5	1.47	3.9	2.8	0.8
-5	117-145	E4	0.2	4.8	36.3	48.2	5.6	95.1	2.7	2.2	42.4	1.55	4.1	2.7	1.0
-6	145-157	Bt1	0.2	4.2	29.2	34.4	2.6	70.6	3.2	26.2	1.3	1.61	18.2	16.9	12.0
-7	157-168	Bt2	0.2	3.2	28.8	31.4	1.4	65.0	2.0	33.0	0.4	1.66	18.9	18.0	1.4
-8	168-203	Btg	0.2	3.4	28.8	36.2	0.2	68.8	3.4	27.8	1.1	1.74	16.9	15.6	11.1

See footnote at end of table.

TABLE 19.--PHYSICAL ANALYSES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very coarse (2-1 mm)	Sand: Coarse (1-0.5 mm)	Sand: Medium (0.5-0.25 mm)	Sand: Fine (0.25-0.1 mm)	Sand: Very fine (0.1-0.05 mm)	Sand: Total (2-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)	Hydraulic conductivity*	Bulk density (field moist)*	Water content: 1/10 bar	Water content: 1/3 bar	Water content: 15 bar
	Cm		Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Cm/hr	g/cm^3	Pct (wt)		
Tavares fine sand:															
S83FL-105-19-1	0-20	Ap	0.0	0.9	16.3	72.6	7.5	97.3	1.2	1.5	16.2	1.65	5.1	3.3	0.9
-2	20-43	C1	0.0	1.0	16.9	73.4	5.7	97.0	1.1	1.9	20.7	1.57	5.6	3.5	0.9
-3	43-76	C2	0.0	0.9	16.9	72.7	6.1	96.6	1.4	2.0	31.6	1.47	4.6	2.8	0.9
-4	76-132	C3	0.0	0.9	16.5	73.0	6.0	96.4	1.5	2.1	35.5	1.51	4.7	3.2	0.8
-5	132-203	C4	0.0	0.9	15.8	75.4	5.7	97.8	0.9	1.3	38.8	1.55	3.7	2.0	0.6
Wabasso fine sand:															
S81FL-105-12-1	0-18	Ap	0.0	1.4	27.6	52.1	13.6	94.7	4.6	0.7	6.3	1.48	14.7	9.2	2.7
-2	18-56	E	0.0	1.6	25.0	52.7	15.9	95.2	4.2	0.6	7.7	1.69	5.4	2.2	0.2
-3	56-76	Bh	0.0	1.8	24.2	51.2	14.9	92.1	6.1	1.8	4.5	1.58	15.5	11.9	1.9
-4	76-89	BE	0.1	2.1	22.5	51.1	17.6	93.4	4.6	2.0	4.6	1.71	10.9	5.9	0.9
-5	89-130	Btg1	0.0	1.1	18.3	39.9	14.1	73.4	5.4	21.2	0.0	1.62	23.2	21.8	9.8
-6	130-170	Btg2	0.0	1.4	20.2	41.8	15.4	78.8	7.0	14.2	0.0	1.83	15.2	13.9	5.7
-7	170-203	Cg	0.0	1.6	17.4	41.0	18.4	78.4	5.6	16.0	0.1	1.85	14.7	13.2	7.3
Zolfo fine sand:															
S78FL-105-06-1	0-18	Ap	0.0	0.8	14.7	63.6	15.9	95.0	3.2	1.8	24.9	1.37	10.6	6.6	2.7
-2	18-36	E1	0.0	1.1	13.6	63.9	14.7	93.3	4.2	2.5	21.0	1.30	10.5	7.6	2.7
-3	36-76	E2	0.0	1.0	13.0	66.1	15.1	95.2	3.0	1.8	33.8	1.54	6.3	3.6	1.4
-4	76-170	E3	0.1	1.0	13.2	66.4	15.4	96.1	2.6	1.3	25.6	1.62	6.7	3.2	1.1
-5	170-180	BE	0.0	0.9	9.8	65.2	19.8	95.7	3.7	0.6	24.3	1.60	7.9	3.6	0.8
-6	180-203	Bh	0.0	1.0	10.3	65.4	16.5	93.2	5.6	1.2	7.8	1.62	11.5	6.6	2.3

* Some of this data is slightly outside of the properties given in table 16. The original concept has not been changed at this time because of the small amount of data available.

TABLE 20.--CHEMICAL ANAYLSES OF SELECTED SOILS

[Absence of an entry indicates that data were not available]

Soil name and sample number	Depth	Horizon	Extractable bases					Extractable acidity	Sum of cations	Base saturation	Organic carbon	Electrical conductivity	pH			Pyrophosphate extractable			Citrate-dithionite extractable	
			Ca	Mg	Na	K	Sum						H_2O (1:1)	$CaCl_2$ 0.1m (1:2)	KCl in (1:1)	C	Fe	Al	Fe	Al
	Cm		----Milliequivalents/100 grams of soil---							Pct	Pct	Mmhos/cm				Pct	Pct	Pct	Pct	Pct
Apopka fine sand:																				
S77FL-105-04-1	0-18	Ap	4.27	0.83	0.02	0.11	5.23	2.47	7.70	68	0.94	0.12	6.7	6.3	6.3	---	---	---	---	---
-2	18-53	E1	0.26	0.08	0.00	0.04	0.38	4.87	5.25	7	0.42	0.03	5.5	4.4	3.8	---	---	---	---	---
-3	53-89	E2	0.17	0.05	0.00	0.03	0.25	2.84	3.09	8	0.27	0.03	5.4	4.5	3.9	---	---	---	---	---
-4	89-130	E3	0.14	0.05	0.01	0.04	0.24	1.82	2.06	12	0.13	0.03	5.5	4.6	4.2	---	---	---	---	---
-5	130-155	Bt1	0.73	0.20	0.01	0.14	1.08	4.12	5.20	21	0.16	0.11	4.8	4.3	4.0	---	---	---	0.80	0.22
-6	155-203	Bt2	0.87	0.28	0.01	0.19	1.35	9.22	10.57	13	0.14	0.23	4.3*	4.0	3.8	---	---	---	3.70	0.51
Archbold sand:																				
S83FL-105-23-1	0-10	A	0.17	0.04	0.04	0.01	0.26	2.19	2.45	11	0.22	0.00	4.5	4.1	3.9	---	---	---	---	---
-2	10-68	C	0.03	0.01	0.02	0.00	0.06	1.42	1.48	4	0.04	0.00	4.9	4.7	4.6	---	---	---	---	---
-3	68-132	C	0.02	0.01	0.02	0.00	0.05	1.12	1.17	4	0.01	0.00	4.8	4.9	4.8	---	---	---	---	---
-4	132-203	C	0.03	0.02	0.03	0.00	0.08	1.87	1.95	4	0.02	0.00	4.7	4.9	4.9	---	---	---	---	---
Astatula sand:																				
S83FL-105-21-1	0-18	A	0.77	0.09	0.04	0.02	0.92	3.34	4.26	22	0.52	0.00	4.9	4.7	4.8	---	---	---	---	---
-2	18-91	C1	0.11	0.02	0.04	0.01	0.18	1.95	2.13	8	0.16	0.00	5.2	5.0	5.0	---	---	---	---	---
-3	91-162	C1	0.04	0.02	0.03	0.00	0.09	1.43	1.52	6	0.06	0.00	5.0	5.0	5.1	---	---	---	---	---
-4	162-203	C2	0.02	0.01	0.02	0.00	0.05	1.35	1.40	4	0.03	0.00	4.9	5.1	5.1	---	---	---	---	---
Candler sand:																				
S83FL-105-22-1	0-15	Ap	5.25	0.31	0.05	0.04	5.65	2.53	8.18	69	0.80	0.01	5.7	5.6	5.9	---	---	---	---	---
-2	15-107	E1	0.32	0.03	0.03	0.00	0.38	1.15	1.53	25	0.07	0.00	5.6	5.5	5.2	---	---	---	---	---
-3	107-160	E2	0.19	0.04	0.04	0.01	0.28	1.12	1.40	20	0.05	0.00	5.6	5.5	5.2	---	---	---	---	---
-4	160-203	E&Bt	0.19	0.03	0.03	0.01	0.26	1.14	1.40	19	0.02	0.00	5.4	5.5	5.2	---	---	---	0.09	0.05
Fort Meade sand:																				
S78FL-105-07-1	0-20	Ap	1.70	0.29	0.01	0.21	2.32	13.15	15.48	15	1.74	0.06	5.5	4.7	4.3	---	---	---	---	---
-2	20-64	A	0.15	0.08	0.00	0.08	0.31	12.07	12.38	2	1.14	0.09	4.8	4.6	4.2	---	---	---	---	---
-3*	64-89	C1	0.10	0.08	0.00	0.06	0.24	8.93	9.17	3	0.58	0.18	4.4*	4.4	4.2	---	---	---	---	---
-4*	89-147	C2	0.03	0.00	0.00	0.06	0.09	5.39	5.48	2	0.14	0.11	4.4*	4.3	4.3	---	---	---	---	---
-5	147-206	C3	0.20	0.08	0.00	0.11	0.39	4.57	4.96	8	0.15	0.11	5.1	4.8	4.6	---	---	---	---	---
-6	206-254	2C	0.60	0.12	0.01	0.11	0.84	1.84	2.68	31	0.06	0.20	4.9	4.5	4.2	---	---	---	---	---
Immokalee sand:																				
S81FL-105-09-1	0-18	Ap	4.50	0.31	0.02	0.05	4.88	14.73	19.61	25	1.71	0.10	4.9	4.3	4.4	---	---	---	---	---
-2	18-46	E1	0.43	0.04	0.01	0.00	0.48	5.61	6.09	8	0.09	0.10	5.6	4.8	5.1	---	---	---	---	---
-3	46-99	E2	0.10	0.01	0.01	0.00	0.12	5.43	5.55	2	0.03	0.02	5.9	5.6	5.6	---	---	---	---	---
-4	99-112	Bh1	4.75	0.58	0.07	0.06	5.46	30.24	35.70	15	2.75	0.08	4.5	4.0	3.9	2.15	0.01	0.11	0.03	0.08
-5	112-147	Bh2	2.05	0.50	0.08	0.11	2.74	38.60	41.34	7	2.91	0.09	4.2	3.5	3.3	2.80	0.01	0.12	0.03	0.09
-6	147-168	E'	0.73	0.07	0.02	0.01	0.83	10.15	10.98	8	0.34	0.03	5.2	4.5	4.8	---	---	---	---	---
-7	168-190	B'h1	1.63	0.25	0.03	0.02	1.93	13.86	15.79	12	1.02	0.07	4.6	4.1	4.1	0.90	0.00	0.01	0.04	0.01
-8	190-203	B'h2	0.55	0.22	0.06	0.06	0.89	34.50	35.89	3	2.36	0.09	4.0	3.4	3.4	2.28	0.00	0.10	0.03	0.10

See footnote at end of table.

TABLE 20.--CHEMICAL ANAYLSES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Extractable bases: Ca	Mg	Na	K	Sum	Extractable acidity	Sum of cations	Base saturation	Organic carbon	Electrical conductivity	pH: H_2O (1:1)	$CaCl_2$ 0.1m (1:2)	KCl in (1:1)	Pyrophosphate extractable: C	Fe	Al	Citrate-dithionite extractable: Fe	Al
	Cm		----Milliequivalents/100 grams of soil---							Pct	Pct	Mmhos/cm				Pct	Pct	Pct	Pct	Pct
Kaliga muck:																				
S83FL-105-18-1	0-23	Oap	12.80	1.56	0.58	0.24	15.18	117.09	132.27	11	45.87	0.02	3.6	3.3	3.1	---	---	---	---	---
-2	23-76	Oa	5.32	2.76	0.50	0.13	8.71	120.19	128.90	7	55.96	0.02	3.5	3.1	2.8	---	---	---	---	---
-3	76-140	Cg1	2.81	2.88	0.15	0.11	5.95	13.38	19.33	31	1.00	0.03	4.8	4.0	3.8	---	---	---	---	---
-4	140-190	Cg2	4.27	5.45	0.16	0.22	10.10	4.64	14.74	69	0.18	0.04	6.5	5.9	5.4	---	---	---	---	---
-5	190-203	Cg3	0.04	0.03	0.01	0.01	0.09	1.04	1.13	8	0.09	0.01	5.1	4.2	4.2	---	---	---	---	---
Lynne sand:																				
S77FL-105-03-1	0-13	Ap	10.43	0.70	0.11	0.09	11.83	6.53	18.36	64	2.81	0.32	6.4	5.7	5.5	---	---	---	---	---
-2	13-28	E1	0.28	0.10	0.03	0.02	0.43	0.81	1.24	35	0.43	0.10	4.7	3.8	3.5	---	---	---	---	---
-3	28-53	E2	0.05	0.02	0.01	0.01	0.09	0.27	0.36	25	0.08	0.02	6.0*	4.6	4.5	---	---	---	---	---
-4	53-71	Bh	0.06	0.17	0.06	0.01	0.30	14.73	15.03	2	1.34	0.05	5.2	4.1	4.0	1.14	0.06	0.28	0.10	0.23
-5	71-84	BE	0.04	0.06	0.04	0.02	0.16	5.27	5.43	3	0.45	0.04	5.3	4.4	4.4	---	---	---	---	---
-6	84-132	Btg1	0.06	0.83	0.14	0.01	1.04	10.44	11.48	9	0.42	0.07	5.0	4.1	3.7	---	---	---	2.28	0.34
-7	132-157	Btg2	0.32	1.56	0.16	0.01	2.05	8.31	10.36	20	0.20	0.07	5.3	4.2	3.7	---	---	---	0.90	0.15
-8	157-203	Btg3	0.26	2.21	0.17	0.01	2.65	6.69	9.34	28	0.17	0.07	5.1	4.1	3.6	---	---	---	0.35	0.11
Millhopper fine sand:																				
S83FL-105-20-1	0-15	Ap	1.87	0.21	0.06	0.05	2.19	8.21	10.40	21	0.96	0.01	4.9	4.6	4.8	---	---	---	---	---
-2	15-48	E1	0.41	0.06	0.03	0.01	0.51	6.61	7.12	7	0.24	0.00	5.2	5.0	4.9	---	---	---	---	---
-3	48-96	E2	0.10	0.04	0.03	0.01	0.18	5.11	5.29	3	0.10	0.00	5.3	5.1	4.9	---	---	---	---	---
-4	96-160	E3	0.07	0.04	0.03	0.00	0.14	2.97	3.11	5	0.04	0.00	5.3	5.1	5.0	---	---	---	---	---
-5	160-173	Bt	0.49	0.25	0.05	0.08	0.87	10.14	11.01	8	0.09	0.01	4.5	4.0	4.1	---	---	---	0.43	0.10
-6	173-203	Btg	0.47	0.31	0.06	0.10	0.94	11.77	12.71	7	0.08	0.01	4.3*	4.0	4.0	---	---	---	0.44	0.09
Myakka fine sand:																				
S83FL-105-16-1	0-18	Ap	1.28	0.18	0.04	0.03	1.53	5.47	7.00	22	1.34	0.04	4.5	3.8	3.8	---	---	---	---	---
-2	18-64	E	0.05	0.01	0.01	0.00	0.07	0.67	0.74	9	0.10	0.01	4.8	4.2	4.1	---	---	---	---	---
-3	64-76	Bh1	0.42	0.23	0.03	0.01	0.48	20.43	20.91	2	1.94	0.03	4.4	4.1	4.0	1.18	0.01	0.33	0.05	0.16
-4	76-91	Bh2	0.09	0.01	0.03	0.01	0.15	13.39	13.53	1	0.91	0.01	4.5	4.3	4.2	0.61	0.01	0.26	0.07	0.11
-5	91-150	C	0.04	0.01	0.02	0.00	0.07	5.05	5.12	1	0.32	0.01	4.6	4.4	4.4	---	---	---	---	---
-6	150-203	C	0.09	0.02	0.03	0.01	0.15	6.81	6.96	2	0.41	0.02	4.9	4.4	4.5	---	---	---	---	---
Narcoossee sand:																				
S83FL-105-24-1	0-13	A	1.29	1.09	0.20	0.20	2.78	22.79	25.57	11	4.59	0.03	3.4	3.2	3.0	---	---	---	---	---
-2	13-43	E	0.04	0.06	0.12	0.03	0.25	3.52	3.77	7	0.20	0.01	3.7	3.8	3.7	---	---	---	---	---
-3	43-48	Bh1	0.17	0.51	0.22	0.13	1.03	13.38	14.41	7	1.34	0.02	3.8	3.6	3.7	0.87	0.01	0.11	0.03	0.09
-4	48-56	Bh2	0.20	0.43	0.23	0.15	1.01	29.02	30.03	3	1.98	0.01	4.5	4.0	4.1	0.21	0.01	0.11	0.03	0.31
-5	56-76	BC	0.04	0.11	0.16	0.06	0.37	9.10	9.47	4	0.65	0.01	4.5	4.4	4.5	---	---	---	---	---
-6	76-122	C1	0.04	0.11	0.11	0.04	0.30	3.23	3.53	8	0.22	0.01	4.8	4.8	4.8	---	---	---	---	---
-7	122-203	C2	0.08	0.31	0.15	0.07	0.61	4.62	5.23	12	0.15	0.01	4.6	4.3	4.6	---	---	---	---	---

See footnote at end of table.

TABLE 20.--CHEMICAL ANAYLSES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Hori- zon	Extractable bases Ca	Mg	Na	K	Sum	Ex- tract- able acid- ity	Sum of cat- ions	Base sat- ura- tion	Or- ganic car- bon	Electri- cal conduc- tivity	pH H_2O (1: 1)	$CaCl_2$ 0.1m (1:2)	KCl in (1: 1)	Pyrophosphate extractable C	Fe	Al	Citrate-dithio- nite extract- able Fe	Al
	Cm		----Milliequivalents/100 grams of soil---							Pct	Pct	Mmhos/cm				Pct	Pct	Pct	Pct	Pct
Ona fine sand:																				
S81FL-105-13-1	0-10	Ap	15.25	3.87	0.16	0.78	20.06	4.62	24.68	81	4.30	0.27	7.1	6.7	6.7	---	---	---	---	---
-2	10-25	A	4.25	0.53	0.08	0.28	5.14	5.73	10.87	47	1.50	0.08	6.0	5.2	5.2	---	---	---	---	---
-3	25-48	Bh	0.85	0.08	0.08	0.15	1.16	12.14	13.30	9	1.05	0.04	5.5	4.7	4.5	1.07	0.03	0.29	0.04	0.23
-4	48-61	BE	0.63	0.03	0.06	0.12	0.84	5.84	6.68	13	0.47	0.08	5.4	4.9	4.7	---	---	---	---	---
-5	61-94	E	0.13	0.02	0.04	0.06	0.25	3.05	3.30	8	0.22	0.07	4.8	4.8	4.7	---	---	---	---	---
-6	94-127	E	0.20	0.02	0.08	0.10	0.40	2.10	2.50	16	0.14	0.14	5.0	5.0	5.0	---	---	---	---	---
-7	127-190	B'h1	0.09	0.02	0.03	0.02	0.16	4.22	4.38	4	0.36	0.05	4.2	4.8	4.8	0.37	0.02	0.13	0.03	0.07
-8	190-203	B'h2	0.12	0.02	0.03	0.01	0.18	2.84	3.02	6	0.37	0.09	5.4	5.0	4.8	0.35	0.02	0.11	0.02	0.06
Pomona fine sand:																				
S77FL-105-02-1	0-15	Ap	2.74	0.45	0.04	0.09	3.32	9.79	13.11	25	2.15	0.12	4.8	3.9	3.6	---	---	---	---	---
-2	15-30	E1	0.18	0.02	0.00	0.01	0.21	0.97	1.18	18	0.28	0.24	4.5	3.8	3.5	---	---	---	---	---
-3	30-53	E2	0.06	0.00	0.01	0.01	0.08	0.32	0.40	20	0.17	0.05	5.5	4.2	3.7	---	---	---	---	---
-4	53-66	Bh	0.51	0.14	0.05	0.16	0.86	24.32	25.18	3	2.61	0.37	4.4	3.8	3.6	1.88	0.01	0.35	0.26	0.03
-5	66-86	E'1	0.01	0.01	0.01	0.02	0.05	5.16	5.21	1	0.40	0.13	4.8	4.6	4.5	---	---	---	---	---
-6	86-122	E'2	0.03	0.00	0.00	0.00	0.03	1.15	1.18	3	0.10	0.09	5.6	4.8	4.7	---	---	---	---	---
-7	122-152	Btg1	0.08	0.48	0.06	0.00	0.62	4.38	5.00	12	0.13	1.10	4.4	4.2	4.0	---	---	---	0.12	0.41
-8	152-185	Btg2	0.02	0.79	0.17	0.00	0.98	5.92	6.90	14	0.14	0.08	5.1	4.1	3.9	---	---	---	0.09	0.22
-9	185-203	Cg	0.03	0.18	0.09	0.00	0.30	9.18	9.48	3	0.20	0.65	4.8	4.6	4.5	---	---	---	---	---
Samsula muck:																				
S83FL-105-17-1	0-18	Oa1	2.64	1.81	0.59	0.41	5.45	111.18	116.63	5	47.86	0.07	3.6	3.1	2.9	---	---	---	---	---
-2	18-68	Oa2	0.48	0.56	0.51	0.12	1.67	115.81	117.48	1	57.56	0.03	3.7	3.3	3.2	---	---	---	---	---
-3	68-79	Oa3	0.39	0.40	0.41	0.04	1.24	113.52	114.76	1	54.06	0.04	3.5	3.4	3.6	---	---	---	---	---
-4	79-132	C	0.03	0.02	0.02	0.07	0.14	5.00	5.14	3	0.75	0.04	4.0	4.1	4.2	---	---	---	---	---
-5	132-203	Cg	0.03	0.02	0.02	0.00	0.07	2.36	2.43	3	0.30	0.03	4.5	4.4	4.4	---	---	---	---	---
Satellite sand:																				
S83FL-105-14-1	0-15	Ap	3.00	0.20	0.03	0.02	3.25	4.71	7.96	41	1.45	0.07	7.1	6.7	5.5	---	---	---	---	---
-2	15-46	C1	0.32	0.02	0.02	0.00	0.36	2.55	2.91	12	0.21	0.02	6.1	5.0	5.0	---	---	---	---	---
-3	46-102	C2	0.08	0.01	0.01	0.00	0.10	3.76	3.86	3	0.10	0.01	5.7	4.9	4.9	---	---	---	---	---
-4	102-152	C2	0.09	0.02	0.01	0.00	0.12	2.41	2.53	5	0.07	0.01	5.3	5.0	5.0	---	---	---	---	---
-5	152-203	C3	0.11	0.01	0.01	0.00	0.13	4.04	4.17	3	0.11	0.01	5.5	4.8	4.7	---	---	---	---	---
Sparr sand:																				
S77FL-105-05-1	0-20	Ap	0.64	0.21	0.00	0.05	0.90	4.33	5.23	17	0.92	0.03	5.6	4.5	4.1	---	---	---	---	---
-2	20-51	E1	0.37	0.07	0.00	0.02	0.46	2.91	3.37	14	0.39	0.02	5.8	4.8	4.4	---	---	---	---	---
-3	51-96	E2	0.12	0.02	0.00	0.01	0.15	1.42	1.57	10	0.16	0.02	5.9	4.9	4.7	---	---	---	---	---
-4	96-117	E3	0.04	0.02	0.00	0.01	0.07	0.95	1.02	7	0.11	0.02	5.8	4.6	4.6	---	---	---	---	---
-5	117-145	E4	0.02	0.02	0.00	0.01	0.05	0.88	0.93	5	0.08	0.02	5.6	4.5	4.5	---	---	---	---	---
-6	145-157	Bt1	0.23	0.33	0.02	0.02	0.60	4.73	5.33	11	0.26	0.03	5.1	4.2	4.0	---	---	---	0.44	0.16
-7	157-168	Bt2	0.19	0.32	0.02	0.01	0.54	5.07	5.61	10	0.19	0.02	5.2	4.2	4.0	---	---	---	1.22	0.22
-8	168-203	Btg	0.36	0.18	0.02	0.01	0.57	4.16	4.73	12	0.07	0.03	5.1	4.2	3.9	---	---	---	0.31	0.10

See footnote at end of table.

TABLE 20.--CHEMICAL ANAYLSES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Extractable bases: Ca	Extractable bases: Mg	Extractable bases: Na	Extractable bases: K	Extractable bases: Sum	Extractable acidity	Sum of cations	Base saturation	Organic carbon	Electrical conductivity	pH: H_2O (1:1)	pH: $CaCl_2$ 0.1m (1:2)	pH: KCl in (1:1)	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	Mmhos/cm				Pct	Pct	Pct	Pct	Pct
Tavares fine sand:																				
S83FL-105-19-1	0-20	Ap	0.31	0.07	0.05	0.04	0.47	9.20	9.67	5	0.48	0.01	4.7	4.2	4.0	---	---	---	---	---
-2	20-43	C1	0.10	0.05	0.05	0.01	0.21	5.72	5.93	4	0.13	0.01	4.8	4.5	4.6	---	---	---	---	---
-3	43-76	C2	0.11	0.03	0.03	0.01	0.18	7.06	7.24	2	0.20	0.00	4.5	4.3	4.2	---	---	---	---	---
-4	76-132	C3	0.15	0.04	0.05	0.02	0.26	8.18	8.44	3	0.27	0.00	4.3	4.2	4.0	---	---	---	---	---
-5	132-203	C4	0.16	0.06	0.04	0.01	0.27	5.16	5.43	5	0.05	0.00	4.7	4.6	4.7	---	---	---	---	---
Wabasso fine sand:																				
S81FL-105-12-1	0-18	Ap	5.75	0.05	0.03	0.42	6.25	1.24	7.49	83	0.91	0.08	7.0	6.5	6.3	---	---	---	---	---
-2	18-56	E	0.45	0.01	0.02	0.02	0.50	0.40	0.90	56	0.08	0.02	6.9	6.5	4.8	---	---	---	---	---
-3	56-76	Bh	1.75	0.15	0.15	0.41	2.46	8.38	10.84	23	0.93	0.06	6.1	5.3	5.1	0.88	0.03	0.20	0.06	0.16
-4	76-89	BE	0.55	0.02	0.07	0.16	0.80	3.71	4.51	18	0.28	0.04	5.8	5.0	4.8	---	---	---	---	---
-5	89-130	Btg1	6.00	0.09	0.26	4.40	10.75	7.73	18.48	58	0.27	0.08	5.0	4.3	4.0	---	---	---	0.21	0.05
-6	130-170	Btg2	5.50	0.04	0.27	4.24	10.05	4.95	15.00	67	0.10	0.05	5.3	4.4	4.0	---	---	---	0.06	0.02
-7	170-203	Cg	4.50	0.03	0.26	3.33	8.12	3.89	12.01	68	0.10	0.04	5.6	4.6	4.4	---	---	---	---	---
Zolfo fine sand:																				
S78FL-105-06-1	0-18	Ap	2.65	0.29	0.02	0.18	3.14	5.66	8.80	36	1.53	0.05	6.2	5.1	4.9	---	---	---	---	---
-2	18-36	E1	0.33	0.04	0.01	0.13	0.51	8.38	8.89	6	0.90	0.05	5.8	4.7	4.4	---	---	---	---	---
-3	36-76	E2	0.05	0.04	0.00	0.04	0.13	1.77	1.90	7	0.25	0.04	5.7	4.9	4.7	---	---	---	---	---
-4	76-170	E3	0.00	0.04	0.00	0.02	0.06	1.16	1.22	5	0.09	0.04	5.1	4.9	4.7	---	---	---	---	---
-5	170-180	BE	0.00	0.04	0.00	0.01	0.05	1.35	1.40	4	0.09	0.03	5.6	5.1	5.0	0.02	0.01	0.05	0.04	0.02
-6	180-203	Bh	0.03	0.04	0.00	0.01	0.08	1.84	1.92	4	0.27	0.05	5.6	5.0	4.9	0.13	0.01	0.15	0.06	0.02

* Field pH was used in soil description. Laboratory pH is slightly outside the present range in characteristics for the series and is suspect or is within the normal error of observation.

TABLE 21.--CLAY MINERALOGY OF SELECTED SOILS

Soil name and sample number	Depth	Horizon	Clay minerals					
			Montmorillonite	14-angstrom intergrade	Kaolinite	Gibbsite	Quartz	Mica
	Cm		Pct	Pct	Pct	Pct	Pct	Pct
Apopka fine sand:								
S77FL-105-04-1	0-18	Ap	0	41	41	0	18	0
-3	53-89	E2	0	37	29	14	20	0
-5	130-155	Bt1	0	21	50	26	3	0
-6	155-203	Bt2	0	11	77	12	0	0
Archbold sand:								
S83FL-105-23-1	0-10	A	29	12	14	0	45	0
-2	10-68	C	16	0	17	0	60	7
-4	132-203	C	9	0	10	0	74	7
Astatula sand:								
S83FL-105-21-1	0-18	A	14	27	18	0	41	0
-2	18-91	C1	0	31	15	0	54	0
-4	162-203	C2	0	14	8	0	78	0
Candler sand:								
S83FL-105-22-1	0-15	Ap	0	20	72	0	8	0
-2	15-107	E1	0	26	64	0	10	0
-4	160-203	E&Bt	0	27	68	0	5	0
Fort Meade sand:								
S78FL-105-07-1	0-20	Ap	0	57	20	0	23	0
-3	64-89	C1	0	35	33	0	32	0
-6	206-254	2C	0	18	82	0	0	0
Immokalee sand:								
S81FL-105-09-1*	0-18	Ap	20	0	11	0	69	0
-4*	99-112	Bh1	25	0	3	0	72	0
-7*	168-190	B'h1	0	0	5	0	95	0
Kaliga muck:								
S83FL-105-18-3	76-140	Cg1	42	9	26	0	23	0
-5	190-203	Cg3	39	13	22	0	26	0
Lynne sand:								
S77FL-105-03-1	0-13	Ap	0	5	6	0	89	0
-4	53-71	Bh	0	13	20	0	67	0
-6	84-132	Btg1	0	0	100	0	0	0
-8	157-203	Btg3	0	0	100	0	0	0
Millhopper fine sand:								
S83FL-105-20-1	0-15	Ap	18	36	27	0	19	0
-3	48-96	E2	12	37	24	0	27	0
-5	160-173	Bt	11	17	61	0	11	0
Myakka fine sand:								
S83FL-105-16-1	0-18	Ap	29	0	12	0	59	0
-3	64-76	Bh1	14	31	26	0	29	0
-6	150-203	C	29	0	22	0	49	0
Narcoossee sand:								
S83FL-105-24-1*	0-13	A	0	0	0	0	100	0
-4*	48-56	Bh2	17	16	10	0	57	0
-7*	122-203	C2	13	11	32	0	44	0

See footnote at end of table.

TABLE 21.--CLAY MINERALOGY OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Clay minerals					
			Montmorillonite	14-angstrom intergrade	Kaolinite	Gibbsite	Quartz	Mica
	Cm		Pct	Pct	Pct	Pct	Pct	Pct
Ona fine sand:								
S81FL-105-13-1	0-10	Ap	22	11	7	0	60	0
-3*	25-48	Bh	20	23	7	0	50	0
-5*	61-94	E	15	15	6	0	64	0
-7	127-190	B'h1	0	0	0	0	100	0
Pomona fine sand:								
S77FL-105-02-1	0-15	Ap	0	0	0	0	100	0
-4	53-66	Bh	0	16	15	13	53	0
-7	122-152	Btg1	0	18	33	32	17	0
-9	185-203	Cg	0	0	40	26	34	0
Samsula muck:								
S83FL-105-17-4	79-132	C	6	30	51	0	13	0
-5	132-203	Cg	5	25	60	0	10	0
Satellite sand:								
S83FL-105-14-1*	0-15	Ap	20	13	16	0	51	0
-3*	46-102	C2	0	0	0	0	100	0
-5*	152-203	C3	0	0	4	0	96	0
Sparr sand:								
S77FL-105-05-1	0-20	Ap	0	29	44	0	27	0
-3	51-96	E2	0	33	42	0	25	0
-6	145-157	Bt1	0	4	93	0	3	0
-8	168-203	Btg	0	0	100	0	0	0
Tavares fine sand:								
S83FL-105-19-1	0-20	Ap	18	47	20	0	15	0
-3	43-76	C2	19	50	32	0	9	0
-5	132-203	C4	13	45	28	0	14	0
Wabasso fine sand:								
S81FL-105-12-1	0-18	Ap	23	0	13	0	64	0
-3*	56-76	Bh	20	15	10	0	55	0
-5	89-130	Btg1	89	0	8	0	3	0
-7	170-203	Cg	76	0	18	0	6	0
Zolfo fine sand:								
S78FL-105-06-1	0-18	Ap	0	20	13	0	67	0
-5	170-180	BE	0	3	4	0	93	0

* Detectable amounts of feldspar present.

TABLE 22.--ENGINEERING INDEX TEST DATA

[Tests performed by the Florida Department of Transportation (FDOT) in cooperation with the U.S. Bureau of Public Roads, in accordance with standard procedures of the American Association of State Highway and Transportation Officials (AASHTO). See the section "Soil Series and Their Morphology" for location of pedon sampled. NP means nonplastic]

Soil name, report number, horizon, and depth in inches	Classification		Mechanical analyses*								Liquid limit	Plasticity index	Moisture density**	
			Percentage passing sieve--				Percentage smaller than--						Maximum dry density	Optimum moisture
	AASHTO***	Unified	No. 4	No. 10	No. 40	No. 200	.05 mm	.02 mm	.005 mm	.002 mm				
											Pct		Lb/ft^3	Pct
Apopka (S77FL-105-04)														
Bt1 ------ 51-61	A-2-4(0)	SC	100	100	97	26	25	22	21	21	24	10	116	13.9
Archbold (S83FL-105-23)														
C --------- 4-80	A-3(0)	SP	100	100	79	1	1	1	0	0	---	NP	103	13.9
Astatula (S83FL-105-21)														
C1 -------- 7-64	A-3(0)	SP	100	100	88	1	1	1	1	1	---	NP	104	14.5
Candler (S83FL-105-22)														
E&Bt ----- 63-80	A-3(0)	SP	100	100	88	3	3	3	2	2	---	NP	103	14.7
Kaliga (S83FL-105-18)														
Cg1 ------ 30-55	A-4(5)	ML	100	100	97	64	57	49	28	20	35	9	90	23.1
Lynne (S77FL-105-03)														
Bh ------- 21-28	A-2-4(0)	SM	100	100	95	18	16	7	5	5	---	NP	112	12.4
Btg1 ----- 33-52	A-7-6(12)	CH	100	100	98	50	47	44	42	42	51	33	96	19.9
Btg3 ----- 62-80	A-7-6(8)	CL	100	100	98	45	43	40	38	37	48	30	103	17.4
Millhopper (S83FL-105-20)														
E3 ------- 38-63	A-2-4(0)	SP-SM	100	100	97	12	7	3	2	1	---	NP	108	13.5
Btg ------ 68-80	A-2-6(0)	SC	100	100	97	26	24	21	19	18	28	15	116	12.9
Myakka (S83FL-105-16)														
E -------- 7-25	A-3(0)	SP	100	100	97	4	3	0	0	0	---	NP	103	12.9
C -------- 36-80	A-3(0)	SP-SM	100	100	97	8	5	3	2	2	---	NP	111	11.5
Narcoossee (S83FL-105-24)														
Bh2 ------ 19-22	A-2-4(0)	SP-SM	100	100	95	11	8	2	1	0	---	NP	113	15.2
C1 ------- 30-48	A-3(0)	SP-SM	100	100	96	5	5	5	4	3	---	NP	110	13.1
Pomona (S77FL-105-02)														
Bh ------- 21-26	A-2-4(0)	SM	100	100	97	19	17	5	4	3	---	NP	99	16.7
E'2 ------ 34-48	A-2-4(0)	SM	100	100	96	16	14	3	2	2	---	NP	113	11.1
Btg2 ----- 60-73	A-4(1)	SC	100	100	96	36	30	24	22	22	23	9	119	12.3
Samsula (S83FL-105-17)														
C -------- 31-52	A-3(0)	SP-SM	100	100	85	6	5	2	1	1	---	NP	106	13.4

See footnotes at end of table.

TABLE 22.--ENGINEERING INDEX TEST DATA--Continued

Soil name, report number, horizon, and depth in inches	Classification		Mechanical analyses*								Liquid limit	Plasticity index	Moisture density**	
			Percentage passing sieve--				Percentage smaller than--						Maximum dry density	Optimum moisture
	AASHTO***	Unified	No. 4	No. 10	No. 40	No. 200	.05 mm	.02 mm	.005 mm	.002 mm				
											Pct		Lb/ft^3	Pct
Satellite (S83FL-105-14)														
C2 ------- 18-60	A-3(0)	SP	100	100	87	3	2	1	0	0	---	NP	102	14.5
Sparr (S77FL-105-05)														
E2 ------- 20-38	A-3(0)	SP-SM	100	100	89	5	4	3	1	0	---	NP	108	12.4
Btg ------ 66-80	A-6(2)	SC	100	100	93	44	36	28	26	25	31	16	113	14.8
Tavares (S83FL-105-19)														
C3 ------- 30-52	A-3(0)	SP-SM	100	100	97	6	6	5	3	2	---	NP	107	13.0

* Mechanical analyses according to AASHTO designation T88-78. Results by this procedure differ somewhat from those obtained by the soil survey procedure of the Soil Conservation Service (SCS). In AASHTO procedure, the fine material is analyzed by the hydrometer method and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method, and the material coarser than 2 millimeters in diameter is excluded from the calculations of grain-size fractions. The mechanical analyses used in this table are not suitable for use in naming textural classes for soil.

** Based on AASHTO designation T99-74.

*** Based on AASHTO designation M145-73.

TABLE 23.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Adamsville	Hyperthermic, uncoated Aquic Quartzipsamments
Anclote	Sandy, siliceous, hyperthermic Typic Haplaquolls
Apopka	Loamy, siliceous, hyperthermic Grossarenic Paleudults
Archbold	Hyperthermic, uncoated Typic Quartzipsamments
Arents	Arents
Astatula	Hyperthermic, uncoated Typic Quartzipsamments
Basinger	Siliceous, hyperthermic Spodic Psammaquents
Bradenton	Coarse-loamy, siliceous, hyperthermic Typic Ochraqualfs
Candler	Hyperthermic, uncoated Typic Quartzipsamments
Chobee	Fine-loamy, siliceous, hyperthermic Typic Argiaquolls
Duette	Sandy, siliceous, hyperthermic Grossarenic Entic Haplohumods
Eaton	Clayey, mixed, hyperthermic Arenic Albaqualfs
EauGallie	Sandy, siliceous, hyperthermic Alfic Haplaquods
Electra	Sandy, siliceous, hyperthermic Arenic Ultic Haplohumods
Felda	Loamy, siliceous, hyperthermic Arenic Ochraqualfs
Floridana	Loamy, siliceous, hyperthermic Arenic Argiaquolls
Fort Meade	Sandy, siliceous, hyperthermic Quartzipsammentic Haplumbrepts
Haplaquents	Haplaquents, clayey
Holopaw	Loamy, siliceous, hyperthermic Grossarenic Ochraqualfs
Hontoon	Dysic, hyperthermic Typic Medisaprists
Hydraquents	Hydraquents, clayey
Immokalee	Sandy, siliceous, hyperthermic Arenic Haplaquods
Kaliga	Loamy, siliceous, dysic, hyperthermic Terric Medisaprists
Kendrick	Loamy, siliceous, hyperthermic Arenic Paleudults
Lochloosa	Loamy, siliceous, hyperthermic Aquic Arenic Paleudults
Lynne	Sandy over clayey, siliceous, hyperthermic Ultic Haplaquods
Malabar	Loamy, siliceous, hyperthermic Grossarenic Ochraqualfs
Millhopper	Loamy, siliceous, hyperthermic Grossarenic Paleudults
Myakka	Sandy, siliceous, hyperthermic Aeric Haplaquods
Narcoossee	Sandy, siliceous, hyperthermic Entic Haplohumods
Neilhurst	Hyperthermic, uncoated Typic Quartzipsamments
*Nittaw	Fine, montmorillonitic, hyperthermic Typic Argiaquolls
Oldsmar	Sandy, siliceous, hyperthermic Alfic Arenic Haplaquods
Ona	Sandy, siliceous, hyperthermic Typic Haplaquods
Paisley	Fine, montmorillonitic, hyperthermic Typic Albaqualfs
Placid	Sandy, siliceous, hyperthermic Typic Humaquepts
Pomello	Sandy, siliceous, hyperthermic Arenic Haplohumods
Pomona	Sandy, siliceous, hyperthermic Ultic Haplaquods
Pompano	Siliceous, hyperthermic Typic Psammaquents
Samsula	Sandy or sandy-skeletal, siliceous, dysic, hyperthermic Terric Medisaprists
Satellite	Hyperthermic, uncoated Aquic Quartzipsamments
Smyrna	Sandy, siliceous, hyperthermic Aeric Haplaquods
Sparr	Loamy, siliceous, hyperthermic Grossarenic Paleudults
St. Augustine	Sandy, siliceous, hyperthermic Udalfic Arents
St. Johns	Sandy, siliceous, hyperthermic Typic Haplaquods
St. Lucie	Hyperthermic, uncoated Typic Quartzipsamments
Tavares	Hyperthermic, uncoated Typic Quartzipsamments
Udorthents	Udorthents
Valkaria	Siliceous, hyperthermic Spodic Psammaquents
Wabasso	Sandy, siliceous, hyperthermic Alfic Haplaquods
Wauchula	Sandy, siliceous, hyperthermic Ultic Haplaquods
Winder	Fine-loamy, siliceous, hyperthermic Typic Glossaqualfs
Zolfo	Sandy, siliceous, hyperthermic Grossarenic Entic Haplohumods

* The soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series.

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