United States
Department of
Agriculture

Soil
Conservation
Service

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

Soil Survey of DeSoto County, Florida

How To Use This Soil Survey

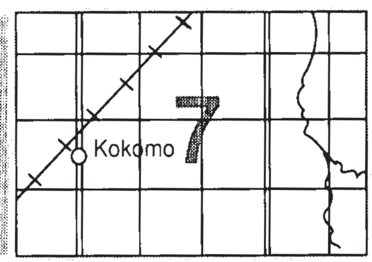
General Soil Map

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

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

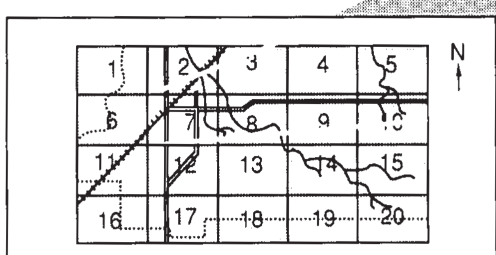
Detailed Soil Maps

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



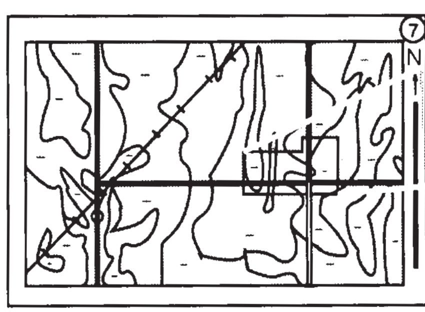
MAP SHEET

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

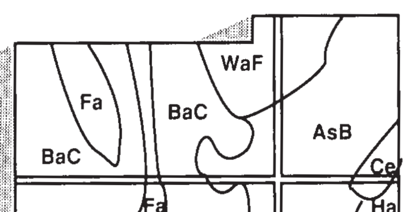


INDEX TO MAP SHEETS

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



MAP SHEET



AREA OF INTEREST

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

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

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

Major fieldwork for this soil survey was completed in 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 and the University of Florida, Institute of Food and Agricultural Sciences, Agricultural Experiment Stations, and Soil Science Department; the Florida Department of Agriculture and Consumer Services; and the Florida Department of Transportation. It is part of the technical assistance furnished to the Peace River Soil and Water Conservation District.

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

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: The historic Peace River traverses DeSoto County through Bradenton, Felda, and Chobee soils. (Photograph by Charles Nickolson, Action Photography)

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Issued July 1989

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Summary of Tables

Foreword

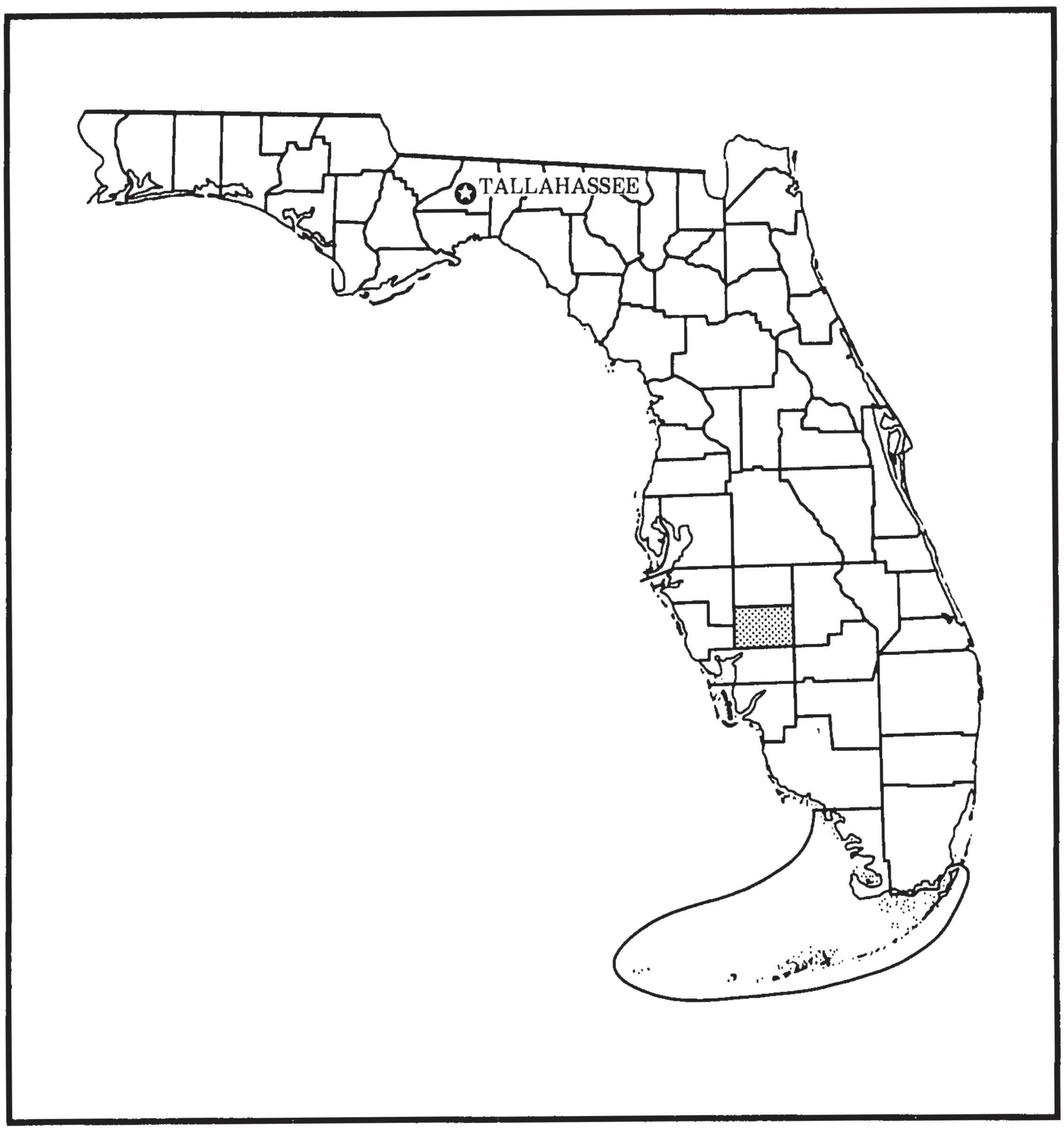
This soil survey contains information that can be used in land-planning programs in DeSoto County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact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

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

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

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

James W. Mitchell
State Conservationist
Soil Conservation Service



Location of DeSoto County in Florida.

Soil Survey of
DeSoto County, Florida

By W. Dean Cowherd, Warren G. Henderson, Jr., Edward J. Sheehan, and
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Additional fieldwork by William E. Perkis, Robert E. Evon,
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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 with the
Florida Department of Agriculture and Consumer Services

DeSoto County is in the southwestern part of peninsular Florida and is bisected, north to south, by the Peace River. It is bordered on the north by Hardee County, on the east by Highlands County, on the South by Charlotte County, and on the west by Manatee and Sarasota Counties. DeSoto County covers 406,867 acres including bodies of water, or about 639 square miles. The county is about 30 miles long and 21 miles wide. Arcadia, the county seat, is in the west-central part of the county.

The economy of DeSoto County is based primarily on agriculture, namely cattle, citrus, and vegetable crops. The largest nonagricultural enterprises are the G. Pierce Wood Memorial Hospital, the DeSoto Correctional Institution, and the Central Maloney Transformer Division.

General Nature of the County

In this section, environmental and cultural factors that affect the use and management of the soils in DeSoto County are described. These factors are climate, history and development, and physiography, geology, and hydrology.

Climate

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

Table 1 gives data on temperature and precipitation for the survey area as recorded at Arcadia in the period 1951 to 1980 *(18)*. Table 2 shows freeze data based on probability of later date in spring (thru July 31) than indicated, probability of earlier date in fall (beginning August 1) than indicated, and freeze free period.

In winter the average temperature is 62 degrees F, and the average daily minimum temperature is 49 degrees. The lowest temperature on record, which occurred at Arcadia on December 13, 1962, is 18 degrees. In summer the average temperature is 81 degrees, and the average daily maximum temperature is 92 degrees. The highest recorded temperature, which occurred at Arcadia on May 27, 1953, is 101 degrees.

The total annual precipitation is 53 inches. Of this, 37 inches, or 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 15 inches. The heaviest 1-day rainfall during the period of record was 7 inches at Arcadia on September 21, 1962. Thunderstorms occur on about 90 days each year, and most occur late in the afternoon.

The average relative humidity in midafternoon is about 57 percent. Humidity is higher at night, and the average at dawn is about 87 percent. The sun shines 61 percent of the time possible in summer and 63 percent in winter. The prevailing wind is from the east-northeast. Average windspeed is highest, 7.8 miles per hour, in March.

History and Development

DeSoto County's history is one of success over impossible odds. It took a special breed of pioneer to overcome the obstacles of the humid, mosquito- and tick-infested swampland and to build one of the state's major agricultural counties *(6)*.

DeSoto County's history begins with the history of Manatee County, which split from Hillsborough County in 1855. At that time most of the settlers lived in areas along the coast. As settlers moved to the interior, they settled along the rivers and creeks. Early settlers in eastern Manatee County had to travel the entire width of the county to visit the courthouse in the village of Manatee. A committee to select a more central site for a new county seat recommended that Pine Level, which was several miles west of the Peace River, be designated the new county seat. This site was approved in 1866. The Pine Level area was surrounded by a vast wilderness that had numerous panthers, bears, wolves, wildcats, alligators, and pestiferous insects *(10)*.

Fort Ogden was a major trading post for the area. It was originally a military fort, known as Camp Ogden, that was built by the United States Army during the Second Seminole War.

DeSoto County was created from Manatee County in May 1887. At that time, the county covered about 3,800 square miles. It was named for the Spanish explorer, Hernando de Soto. The county seat was moved to Arcadia in December 1888. The towns of Brownville, Nocate, and Zolfo Springs were also considered for the county seat. Pine Level, once a bustling town, gradually began to disappear. Today, the Pine Level Methodist Church, which was established in 1868, is still in use.

Arcadia, which began as a small settlement along the Peace River in the 1870's, was first known as Waldron's Landing, then Tater Hill Bluff. The name was changed to Arcadia in 1883. The Peace River was the lifeblood of the county's commerce until 1886, when the railroad was completed along the east side of the river from Bartow to Arcadia.

Phosphate was first discovered in Florida near Arcadia. Mining operations in DeSoto County began when it was learned that phosphate could be extracted from the bottom of the Peace River. By 1900, mining operations had moved out of the county to better grade inland deposits, which could be mined more readily. Phosphate mining is feasible in DeSoto County, but operations are not being expanded at present because of the economic conditions.

The Army Signal Corps built the Carlstrom and Dorr Airfields near Arcadia. These fields were used for training centers and were reactivated for training during World War II. The state later purchased these fields from the Federal government and established a branch of the State Hospital at Chattahoochee, which is now the G. Pierce Wood Memorial Hospital. Dorr Field later became the site of the DeSoto Correctional Institution.

In 1921, DeSoto County was divided to form Glades, Hardee, Highlands, and Charlotte Counties. Arcadia remains the county seat, and other communities include Owens, Fort Winder, and Hull. According to the 1980 census, the population of DeSoto County is about 20,000.

The cattle industry has been significant to both the economy and history of DeSoto County. In the 1890's, cattle rustling and gunfights were common, and Arcadia was known as one of the wildest towns in Florida. The first official rodeo in Florida was held in Arcadia in 1929, and rodeos are still held twice a year.

DeSoto County is on the fringe of Florida's citrus belt. Great strides in producing and processing citrus have been made in recent years.

Although cattle and citrus are the main agribusinesses in the county, plant nurseries, sod companies, and such commodities as poultry, vegetables, and watermelons are also important to the economy.

Physiography, Geology, and Hydrology

Kenneth M. Campbell, Florida Geological Survey, Tallahassee, Florida, helped prepare this section.

Physiography

Several authors have discussed the physiography of the Florida peninsula, but for the purposes of this report, W.A. White's *(19)* classification will be used. Most of DeSoto County lies within the DeSoto Plain (fig. 1). Part of the county, in the southwest corner, falls within the boundaries of the Gulf Coastal Lowlands.

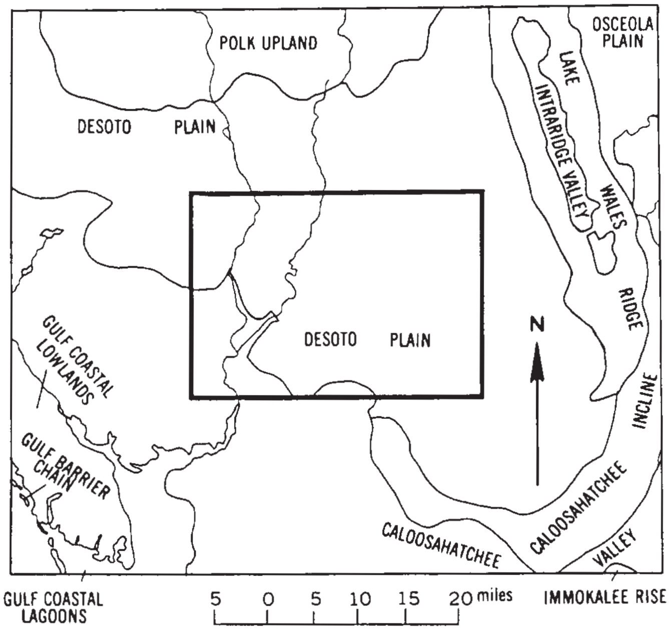

Figure 1.—Most of DeSoto County is in the DeSoto Plain physiographic area.

The elevation within the county ranges from very near sea level in the southwest corner along the lower Peace River Valley to about 90 feet in the northeast corner of the county. The elevation increases almost imperceptibly from the southwest toward the northeast. The topography tends to be flat with relatively steeper slopes in the vicinity of streams. Much of the interstream area is poorly drained. Many swamps, marshes, and ponds are throughout the county. Peace River, Horse Creek, and Joshua Creek are the major streams within the county.

DeSoto Plain. The DeSoto Plain is a very flat area primarily in Manatee, Hardee, DeSoto, Highlands, Glades, and Charlotte Counties. It is a submarine plain probably formed under Pleistocene Wicomico seas (70 to 100 feet above present sea level). The notable absence of relict shoreline features is evidence of the submarine origin of the DeSoto Plain *(19)*.

Gulf Coastal Lowlands. The southwest corner of DeSoto County is within the Gulf Coastal Lowlands. The prominent topographic features include scarps and terraces, developed during Pleistocene sea level stands, and the entrenched Peace River Valley *(19)*. The Pamlico and Talbot Terraces are within the Gulf Coastal Lowlands in DeSoto County *(8)*. The Pamlico Terrace is at an elevation of about 8 to 25 feet above mean sea level. The Talbot Terrace is at 25 to 42 feet. These terraces extend up the entrenched Peace River Valley. The terraces are poorly defined elevation zones except for those in Peace River Valley. The flood plain of the Peace River lies as much as 30 feet below the surrounding upland surface in this area.

Geology

Surface and near surface sediments in DeSoto County consist of quartz sand, clay, limestone, and dolomite. These sediments range in age from Oligocene (38 to 22.5 million years ago) to Holocene (10,000 years ago to present).

Oligocene Series

Suwannee Limestone. The Suwannee Limestone is below the surface throughout DeSoto County (fig. 2). It is creamy white to light yellowish gray limestone that ranges in texture from wackestone to packstone and is indurated to well indurated and variably recrystallized. The upper part of this sediment is highly fossiliferous, predominantly poorly preserved Foraminifera, with mollusc, echinoid, and coral. Moldic and vuggy porosity is common.

The top of the Suwannee Limestone is about 350 feet below mean sea level in the northeastern and northwestern corners of the county and dips generally to the south and south-southeast. In the southeastern corner of the county, the top of the Suwannee Limestone is at a depth of about 700 feet below mean sea level *(12, 20)*. The Suwannee Limestone ranges in thickness from about 140 feet to more than 400 feet within the county *(20)*. The thinnest part is in extreme northeastern DeSoto County, and the thickest part is along the central part of the western edge of the county.

Miocene Series

Hawthorn Group. The Hawthorn Group, which was raised from formation status to group status, includes sediments that were previously included in the Tampa, Hawthorn, and Bone Valley Formations *(12)*. In DeSoto County, the Hawthorn Group consists of, in ascending order, the Arcadia Formation and the Peace River Formation.

The *Arcadia Formation* is named after the town of Arcadia in DeSoto County. The type section is in the core W12050 between 96 and 216 feet below mean sea level. The Arcadia Formation contains, in ascending order, the Nocatee and Tampa Members and an unnamed member.

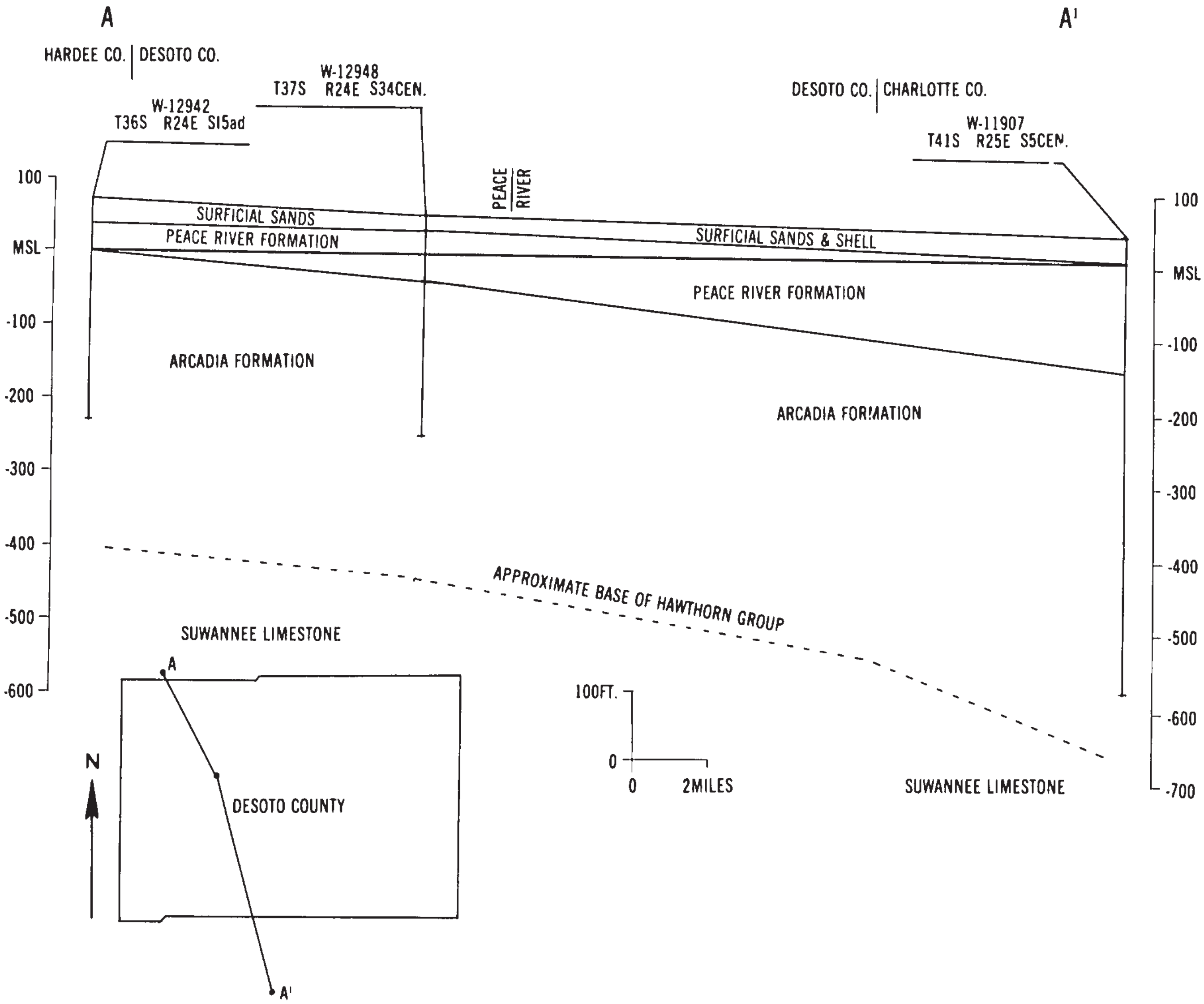

Figure 2.—Suwannee Limestone underlies the soils throughout DeSoto County.

The Nocatee Member of the Arcadia Formation, named for the town of Nocatee in central DeSoto County, is throughout the county. The sediments included in this member were previously called the "sand and clay unit" of the Tampa Limestone. Lithologically, this member is a complex interbedded sequence of variably phosphatic quartz sand, clay, and carbonates, but it is predominantly a clastic (sand and clay) unit. Quartz sand is typically fine to coarse grained, sometimes silty, clayey, calcareous or dolomitic, and variably phosphatic. Clay beds are common. The clay is variably quartz sandy and silty, phosphatic, and calcareous to dolomitic. Carbonate beds are subordinate within the Nocatee Member *(12)*.

The top of the Nocatee Member is at an elevation of about 200 to 450 feet below mean sea level *(12)*. The upper surface dips to the south and south-southeast. The Nocatee Member ranges from about 125 to slightly more than 200 feet in thickness.

The Tampa Member of the Arcadia Formation is lithologically similar to the Tampa Formation but has a slightly greater phosphate content (1 to 3 percent) and greater areal extent. This member is white to tan quartz sandy limestone that has a carbonate mud matrix.

Varying amounts of clay are generally disseminated throughout the rock. Some beds within the Tampa Member contain more than 50 percent quartz sand, but dolomite is relatively uncommon *(9, 12)*. The Tampa Member is recognizable throughout most of the county; however, the unit becomes indistinct because of a facies change in eastern DeSoto County and south of the DeSoto/Charlotte county line. The top of the Tampa Member is between 150 and 200 feet below mean sea level. This member ranges from 50 to 100 feet in thickness.

The upper (unnamed) member of the Arcadia Formation includes sediments that were previously referred to as the "Hawthorne carbonate unit." Lithologically, these sediments consist of white to yellowish gray, quartz sandy, phosphatic and sometimes clayey, dolomites and limestones (uncommon). Carbonate-rich quartz sand and thin clay beds are occasionally present. This upper member of the Arcadia Formation is throughout DeSoto County. In those areas where the Tampa and Nocatee Members are not recognized, the entire formation remains undifferentiated. The top of the Arcadia Formation ranges from near mean sea level in the northern part of the county to slightly more than 100 feet below mean sea level. It dips generally in a south-southeast direction. Where the Arcadia Formation is differentiated, the upper member is about 100 to 140 feet thick. The entire Arcadia Formation ranges from slightly less than 300 feet to more than 500 feet in thickness *(12)*.

The *Peace River Formation* in DeSoto County consists of those sediments previously described as "upper Hawthorn clastics." The type section is well 12050 (section 16, township 38S, range 26E), which is between 41 feet above and 97 feet below mean sea level (fig. 3). Lithologically, these sediments consist of yellowish gray to light olive green interbedded phosphatic sand, clayey sand, clay, and dolomite stringers.

The top of the Peace River Formation is at or near mean sea level throughout much of the county; however, it is 50 feet above mean sea level in the northwestern part of the county. The base of the Peace River Formation is gradational with the underlying Arcadia Formation and is picked at the point where the sediment changes from predominantly clastic to predominantly carbonate *(12)*. The Peace River Formation dips and thickens in a general southeasterly direction. This formation is about 50 feet thick in the northeastern and southwestern corners of the county. It is more than 160 feet thick in the southeastern corner.

Pliocene-Pleistocene Series

Undifferentiated surficial sands and shell. Surficial deposits of Pliocene-Pleistocene age (5.3 to 0.01 million years ago) blanket the county. These deposits consist of silty, clayey, and shelly sand and variably indurated shell beds. The shell beds generally are limited to the southern third of the county. The undifferentiated surficial sands and shell range from 10 to 30 feet in thickness. Surficial sediments thicken in the south-central part of the county and along the DeSoto/ Highlands county line.

Clean quartz sand of Pleistocene age (1.6 to 0.01 million years ago) forms a veneer over the clayey and shelly sand. These deposits consist of unconsolidated very fine to medium grained quartz sand. The sand is white to light brown and contains trace amounts of phosphate sand and limestone or shell fragments.

Holocene Series

Deposits of Holocene age are primarily limited to present-day stream flood plains, beaches, swamps, marshes, and lakes. These sediments consist of sand, silt, clay, and organic material.

Hydrology

Ground water in DeSoto County is obtained from the surficial aquifer system, the intermediate aquifer system, and the Floridan Aquifer. The aquifers are separated by confining layers that restrict vertical water movement between the aquifer systems.

The *surficial aquifer* consists primarily of quartz sand and undifferentiated surficial sand and shell as well as the uppermost part of the Peace River Formation. With the exception of some lithified shell beds, these sediments are unconsolidated.

The top of the surficial aquifer is the ground water table, and water within this aquifer is generally under unconfined conditions. The base of this aquifer system is formed by the clayey, less permeable beds of the Peace River Formation. This system underlies essentially all of DeSoto County and is used primarily for irrigation of lawns and water for stock *(20)*.

The *intermediate aquifer system* contains water under confined conditions and consists primarily of the limestone and dolomite of the Arcadia Formation. This aquifer corresponds with the upper unit of the Floridan Aquifer. The upper confining layer of the intermediate aquifer system consists of the clayey sediment of the Peace River Formation. The lower confining layer consists of the Nocatee Member of the Arcadia Formation. In DeSoto County, the intermediate aquifer is about 200 feet thick. Typical wells yield up to several

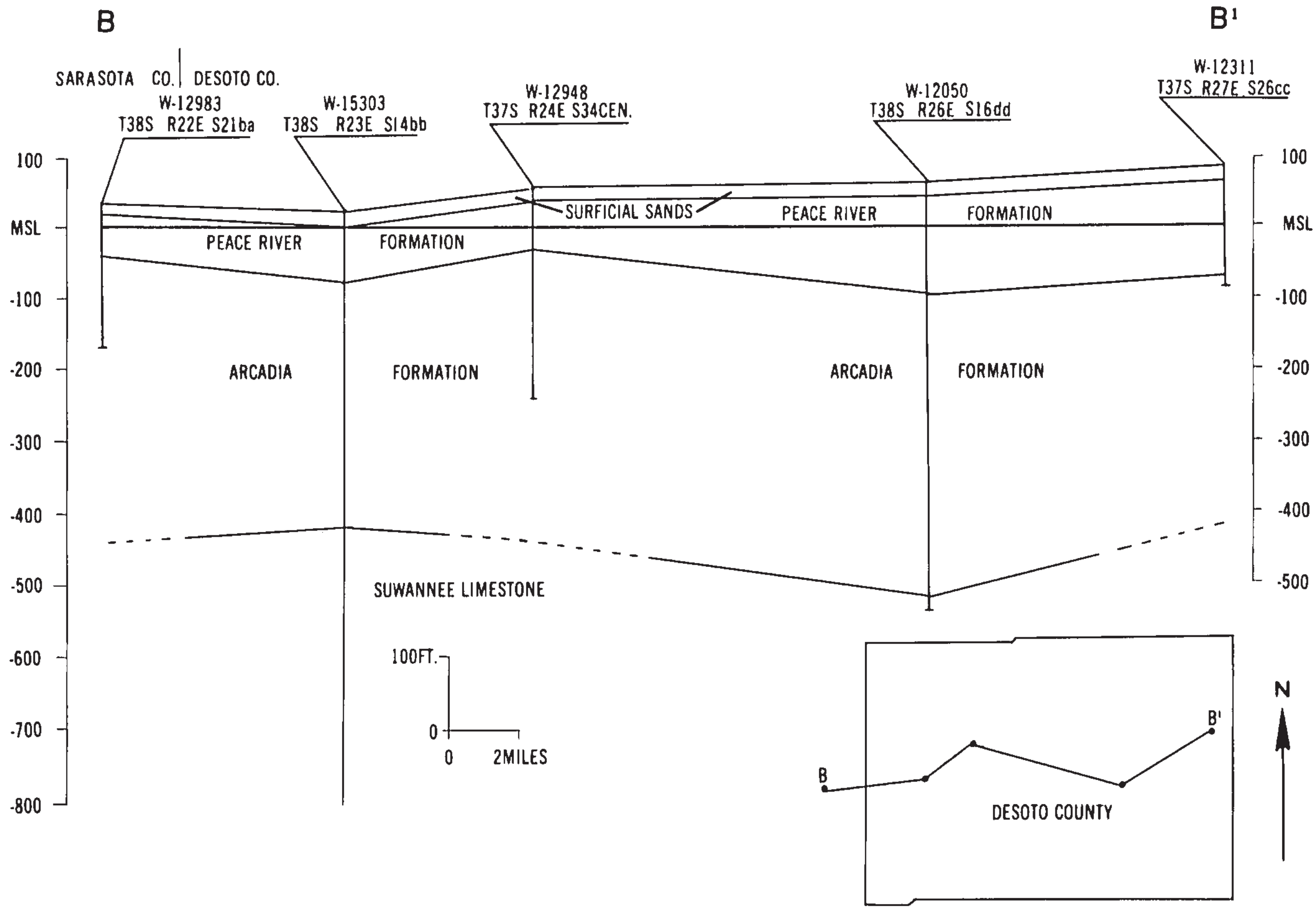

Figure 3.—The Peace River Formation is near sea level throughout DeSoto County.

hundred gallons per minute; however, yield is highly variable *(20)*. This aquifer is used for domestic and public water supplies.

The *Floridan Aquifer* consists of the limestone and dolomite of the Suwannee Limestone and the underlying Ocala Group and Avon Park Limestone. This aquifer contains water under confined conditions. In DeSoto County, the upper confining layer consists of the Nocatee Member of the Arcadia Formation. The top of this aquifer is about 300 feet below mean sea level in the northwestern corner of the county and dips to about 750 feet below mean sea level in the southeastern corner *(5)*. Wells developed in the Floridan Aquifer yield large quantities of water, often in excess of 1,000 gallons per minute. The primary use of water from this aquifer is large-scale irrigation. The water quality is generally poorer than that of the surficial and intermediate aquifers. Water quality in both the Floridan and the intermediate aquifer decreases in a general southwesterly direction *(20)*.

Both the intermediate and the Floridan aquifers are under confined conditions and may contribute to the artesian flow in the southwestern part of the county *(7)*. This area encompasses the entire Peace River Valley, portions of the Horse Creek and Joshua Creek drainages, and the Gulf Coastal Lowlands, as well as the southwestern edge of the DeSoto Plain. The potentiometric surface elevation is 40 to 50 feet above mean sea level for much of the same area *(3)*.

How This Survey Was Made

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

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

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

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, soil reaction, 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. Frequently, 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 contrasting soils are named and mentioned in the map unit descriptions. A few inclusions may not have been observed, and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soils on the landscape.

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

General Soil Map Units

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

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

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

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

Each map unit is rated for community development, citrus, improved pasture, vegetables, and woodland. Community development includes residential and industrial use. Citrus includes fruits that generally require intensive management. Improved pasture includes grasses grown for livestock grazing. The vegetable crops are those grown extensively in the survey area. Woodland refers to areas of native or introduced trees.

Soils of the Sandy Ridges

This general soil map unit consists of nearly level and gently sloping, somewhat poorly drained to moderately well drained soils. The soils are sandy throughout. Some have a dark colored subsoil below a depth of 40 inches.

1. Zolfo-Tavares

Nearly level to gently sloping, somewhat poorly drained and moderately well drained soils that are sandy throughout; some have a dark colored subsoil at a depth of more than 40 inches

In this map unit, the landscape is sandhill areas on uplands. Most areas border the flood plains of the Peace River, Horse Creek, and other well defined drainageways in the county. This map unit consists of deep soils that are intermixed with small areas of poorly drained soils. The natural vegetation is slash pine, longleaf pine, live oak, laurel oak, turkey oak, and an understory of native grasses and annual forbs.

This map unit makes up 13,695 acres, or about 3 percent of the county. It is about 57 percent Zolfo soils, 27 percent Tavares soils, and 16 percent soils of minor extent.

Zolfo soils are somewhat poorly drained. Typically, they have a gray fine sand surface layer about 5 inches thick. The subsurface layer to a depth of about 59 inches is fine sand. It is grayish brown in the upper part, pale brown in the middle part, and light yellowish brown in the lower part. The subsoil to a depth of 80 inches is fine sand that is dark brown in the upper part and very dark brown in the lower part.

Tavares soils are moderately well drained. Typically, they have a dark grayish brown fine sand surface layer about 6 inches thick. The underlying material to a depth of 80 inches is fine sand. It is light yellowish brown in the upper part, very pale brown in the middle part, and white in the lower part.

The minor soils are Satellite, Cassia, Pomello, Ona, and Smyrna soils. Satellite, Cassia, and Pomello soils are in landscape positions similar to those of the Zolfo soils. Ona and Smyrna soils are on the wetter parts of the landscape where drainage is needed for some uses.

The soils of this map unit are used mainly for citrus or improved pasture. In some areas, they are used for urban development or they remain in native vegetation.

Soils of the Flatwoods

The two general soil map units in this group consist of nearly level, poorly drained soils. Some of the soils are sandy throughout, and some are loamy below a depth of 40 inches. Most of these soils have a dark colored subsoil.

2. Smyrna-Myakka-Immokalee

Nearly level, poorly drained soils that are sandy throughout and that have a dark colored subsoil at a depth of 10 to 51 inches

In this map unit, the landscape is nearly level, pine and saw palmetto flatwoods interspersed with small, grassy, wet depressions and cypress and hardwood swamps. Some of the depressions are connected by narrow, wet, poorly defined drainageways. Areas of this map unit are scattered throughout the county. The natural vegetation on the broad flatwoods is slash pine, saw palmetto, waxmyrtle, inkberry, running oak, and native grasses.

This map unit makes up 199,379 acres, or about 49 percent of the county. It is about 25 percent Smyrna soils, 19 percent Myakka soils, 17 percent Immokalee soils, and 39 percent soils of minor extent.

Typically, the Smyrna soils have a dark gray fine sand surface layer about 6 inches thick. The subsurface layer to a depth of about 12 inches is gray fine sand. The subsoil to a depth of about 19 inches is fine sand that is dark reddish brown in the upper part and dark yellowish brown in the lower part. The next layer to a depth of about 37 inches is light yellowish brown fine sand. The subsoil to a depth of about 80 inches is fine sand that is very dark grayish brown in the upper part and dark reddish brown in the lower part.

Typically, the Myakka soils have a dark gray fine sand surface layer about 6 inches thick. The subsurface layer to a depth of about 22 inches is light gray fine sand. The subsoil to a depth of about 32 inches is fine sand that is very dark brown in the upper part and dark brown in the lower part. The substratum to a depth of about 80 inches is fine sand. It is pale brown in the upper part, light gray in the middle part, and grayish brown in the lower part.

Typically, the Immokalee soils have a dark gray fine sand surface layer about 5 inches thick. The subsurface layer to a depth of about 43 inches is white fine sand. The subsoil to a depth of about 65 inches is fine sand that is black in the upper part and dark brown in the middle and lower parts. The middle part of the subsoil has black ortstein fragments. The substratum to a depth of about 80 inches is brown fine sand.

The minor soils are Basinger, EauGallie, Farmton, and Anclote soils. Basinger soils are in sloughs. EauGallie and Farmton soils are in landscape positions similar to those of the Smyrna, Myakka, and Immokalee soils. Anclote soils are in depressions and are ponded for long periods.

The soils of this map unit are used mainly for improved pasture. In some areas, they are used as native range. Other areas have been cleared and bedded and are used for citrus and cultivated crops. In a few areas, these soils are used for residential development. In the wooded areas, they provide food and cover for wildlife, especially for birds and small animals.

3. Farmton-EauGallie-Malabar

Nearly level, poorly drained, sandy soils that have a dark colored subsoil or a yellowish subsoil within a depth of 51 inches that is underlain by loamy material

In this map unit, the landscape is nearly level, pine and saw palmetto flatwoods interspersed with small, grassy, wet depressions and cypress and hardwood swamps. Some of the depressions are connected by narrow, wet, poorly defined drainageways. Areas of this map unit are scattered throughout the county. The natural vegetation on the broad flatwoods is slash pine, saw palmetto, waxmyrtle, inkberry, running oak, and native grasses.

This map unit makes up 106,677 acres, or about 26 percent of the county. It is about 29 percent Farmton soils, 21 percent EauGallie soils, 6 percent Malabar soils, and 44 percent soils of minor extent.

Typically, the Farmton soils have a dark gray fine sand surface layer about 4 inches thick. The subsurface layer to a depth of about 34 inches is fine sand that is gray in the upper part and light gray in the lower part. The subsoil to a depth of about 48 inches is fine sand. It is black in the upper part, very dark gray in the middle part, and dark brown in the lower part. The subsoil to a depth of about 80 inches is sandy clay loam that is light brownish gray in the upper part and pale olive in the lower part.

Typically, the EauGallie soils have a very dark gray fine sand surface layer about 7 inches thick. The subsurface layer to a depth of about 29 inches is fine sand that is gray in the upper part and light gray in the lower part. The subsoil to a depth of about 47 inches is fine sand that is black in the upper part and dark brown in the lower part. The next layer to a depth of about 68 inches is yellowish brown fine sand. The subsoil extends to a depth of 80 inches or more. It is grayish brown fine sandy loam in the upper part and light olive gray sandy clay loam in the lower part.

Typically, the Malabar soils have a dark gray fine sand surface layer about 5 inches thick. The subsurface layer to a depth of about 13 inches is fine sand that is pale brown in the upper part and yellowish brown in the lower part. The subsoil to a depth of about 40 inches is brownish yellow fine sand. The next layer to a depth of about 52 inches is pale brown fine sand. The lower part of the subsoil extends to a depth of 80 inches or more. It is gray fine sandy loam in the upper part and gray sandy clay loam in the lower part.

The minor soils are Wabasso, Immokalee, Myakka, and Felda soils. These soils are in landscape positions similar to those of the Farmton, EauGallie, and Malabar soils and have the same limitations.

The soils of this map unit are used mainly for improved pasture. In some areas, they are used as native range. Other areas have been cleared and bedded and are used for citrus and cultivated crops. In a few areas, these soils are used for residential development. In the wooded areas, they provide food and cover for wildlife, especially for birds and small animals.

Soils of the Sloughs

The two general soil map units in this group consist of nearly level, poorly drained soils. Some of the soils are sandy throughout, some are loamy at a depth of 20 to 40 inches, and some are loamy at a depth of more than 40 inches.

4. Malabar-Pineda-Felda

Nearly level, poorly drained, sandy soils that have a loamy subsoil below a depth of 20 inches

In this map unit, the landscape is nearly level, broad sloughs and poorly defined drainageways interspersed with numerous wet depressions and low flatwood knolls. Areas of this map unit are mainly in the eastern half of the county. During periods of high rainfall, the soils of this map unit are covered by slow moving, shallow water. The natural vegetation in the broad sloughs is St. Johnswort, maidencane, scattered oaks, cabbage palms, and bluestems and other grasses.

This map unit makes up 25,411 acres, or about 6 percent of the county. It is about 34 percent Malabar soils, 20 percent Pineda soils, 12 percent Felda soils, and 34 percent soils of minor extent.

Typically, the Malabar soils have a gray fine sand surface layer about 6 inches thick. The subsurface layer to a depth of about 12 inches is yellowish brown fine sand. The subsoil to a depth of about 50 inches is fine sand. It is light yellowish brown in the upper part, yellowish brown in the middle part, and light olive brown in the lower part. The subsoil to a depth of about 80 inches is gray fine sandy loam.

Typically, the Pineda soils have a black fine sand surface layer about 3 inches thick. The subsurface layer to a depth of about 15 inches is fine sand that is light brownish gray in the upper part and pale brown in the lower part. The subsoil extends to a depth of about 41 inches. It is yellowish brown fine sand in the upper part, yellow fine sand in the middle part, and gray fine sandy loam in the lower part. The substratum to a depth of 80 inches is gray loamy sand and light gray fine sand.

Typically, the Felda soils have a black fine sand surface layer about 7 inches thick. The subsurface layer to a depth of about 29 inches is fine sand that is grayish brown in the upper part and light gray in the lower part. The subsoil to a depth of about 42 inches is gray fine sandy loam. The substratum to a depth of about 80 inches is loamy sand. The upper part is gray, and the lower part is light olive gray.

The minor soils are the Basinger, Valkaria, Floridana, Delray, and Immokalee soils. Basinger and Valkaria soils are in landscape positions similar to those of the Malabar, Pineda, and Felda soils. Floridana and Delray soils are in depressions and are ponded for long periods. Immokalee soils are in slightly higher positions on the landscape and generally are not as productive for range.

The soils of this map unit are used mainly as native range. In some areas, they are used for improved pasture. Other areas have been cleared, drained, and bedded and are used for citrus and cultivated crops.

5. Valkaria-Basinger-Malabar

Nearly level, poorly drained soils that are sandy throughout or sandy to a depth of more than 40 inches and underlain by loamy material

In this map unit, the landscape is nearly level, broad sloughs and poorly defined drainageways interspersed with numerous wet depressions and low flatwood knolls. Areas of this map unit are mainly in the eastern half of the county. During periods of high rainfall, the soils of this map unit are covered by slow moving, shallow water. The natural vegetation in the broad sloughs is St. Johnswort, maidencane, scattered oaks, cabbage palms, and bluestems and other grasses.

This map unit makes up 33,272 acres, or about 8 percent of the county. It is about 40 percent Valkaria soils, 15 percent Basinger soils, 11 percent Malabar soils, and 34 percent soils of minor extent.

Typically, the Valkaria soils have a dark gray fine sand surface layer about 6 inches thick. The subsurface layer to a depth of about 25 inches is fine sand that is gray in the upper part and pale brown in the lower part. The subsoil to a depth of about 31 inches is brownish yellow fine sand. The substratum to a depth of about 80 inches is fine sand that is light gray in the upper part and grayish brown in the lower part.

Typically, the Basinger soils have a dark gray fine sand surface layer about 5 inches thick. The subsurface layer to a depth of about 22 inches is light gray fine sand. The next layer to a depth of about 30 inches is gray fine sand. The subsoil to a depth of about 54 inches is dark brown fine sand. The substratum to a depth of about 80 inches is yellowish brown fine sand.

Typically, the Malabar soils have a gray fine sand surface layer about 6 inches thick. The subsurface layer to a depth of about 12 inches is yellowish brown fine sand. The subsoil to a depth of about 50 inches is fine sand. It is light yellowish brown in the upper part, yellowish brown in the middle part, and light olive brown in the lower part. The subsoil to a depth of about 80 inches is gray fine sandy loam.

The minor soils are Pompano, Anclote, and Immokalee soils. Pompano soils are in landscape positions similar to those of the Valkaria, Basinger, and Malabar soils. Anclote soils are in depressions and are ponded for long periods. Immokalee soils are in slightly higher positions and generally are not as productive for range.

The soils of this map unit are used mainly as native range. In some areas, they are used for improved pasture. Other areas have been cleared, drained, and bedded and are used for citrus and cultivated crops.

Soils of the Wet Depressions, Swamps, Tidal Marshes, and Flood Plains

The four general soil map units in this group consist of nearly level, very poorly drained and poorly drained soils. Some of the soils have a sandy surface layer and a loamy subsoil, some are loamy throughout, and some are organic material underlain by loamy or sandy material.

6. Floridana-Delray-Felda

Nearly level, very poorly drained, sandy soils that have a loamy subsoil below a depth of 20 inches

In this map unit, the landscape is nearly level, freshwater marshes, cypress and hardwood swamps, and depressions. Narrow, wet, poorly defined drainageways are along the edges of and connecting the depressions in some places. Areas of this map unit are throughout the county. The natural vegetation is maidencane, pickerelweed, St. Johnswort, sawgrass, smartweed, sedges, swamp primrose, water oak, cypress, sweetgum, hickory, and other water-tolerant plants.

This map unit makes up 3,318 acres, or less than 1 percent of the county. It is about 18 percent Floridana soils, 18 percent Delray soils, 17 percent Felda soils, and 47 percent soils of minor extent.

Typically, the Floridana soils have a black mucky fine sand surface layer about 22 inches thick. The subsurface layer to a depth of about 34 inches is gray fine sand. The subsoil to a depth of about 45 inches is fine sandy loam that is gray in the upper part and greenish gray in the lower part. The substratum to a depth of about 80 inches is gray loamy fine sand.

Typically, the Delray soils have a black mucky fine sand surface layer about 23 inches thick. The subsurface layer to a depth of about 65 inches is fine sand that is grayish brown in the upper part and gray in the lower part. The subsoil extends to a depth of about 80 inches or more. It is grayish brown fine sandy loam in the upper part, gray fine sandy loam in the middle part, and gray loamy sand in the lower part.

Typically, the Felda soils have a very dark gray fine sand surface layer about 6 inches thick. The subsurface layer to a depth of about 32 inches is fine sand that is light gray in the upper part and grayish brown in the lower part. The subsoil to a depth of about 49 inches is fine sandy loam that is grayish brown in the upper part and gray in the lower part. The substratum to a depth of about 80 inches is light gray fine sand.

The minor soils are Basinger, Gator, Malabar, Samsula, Pineda, and Anclote soils. These soils are in landscape positions similar to those of the Floridana, Delray, and Felda soils and are ponded for long periods.

The soils of this map unit are used for range and native pasture except in areas where the soils are ponded. These soils also provide habitat for wildlife.

7. Gator-Terra Ceia

Nearly level, very poorly drained soils that are organic to a depth of 16 to more than than 51 inches; some are underlain by loamy material; some are subject to flooding

In this map unit, the landscape is nearly level, freshwater marshes and hardwood swamps. Areas of this map unit are in the southeastern part of the county and along the southern part of the Peace River flood plain, which is subject to flooding. The natural vegetation in the hardwood swamps consists of red maple, sweetgum, cypress, hickory, water oak, cabbage palm, magnolia, and an understory of maidencane, ferns, grapevine, saw palmetto, and various aquatic plants. In the freshwater marshes, the vegetation consists of pickerelweed, sawgrass, maidencane, smartweed, sedges, swamp primrose, and other water-tolerant plants.

This map unit makes up 6,667 acres, or about 2 percent of the county. It is about 49 percent Gator soils, 30 percent Terra Ceia soils, and 21 percent soils of minor extent.

Typically, the Gator soils have a black muck surface layer about 22 inches thick. The underlying material to a depth of about 80 inches is fine sandy loam. It is black and very dark grayish brown in the upper part, dark grayish brown in the middle part, and dark gray in the lower part.

Terra Ceia soils are in large marshes and on the Peace River flood plain. Typically, the surface layer is about 58 inches thick. It is black muck in the upper part and dark reddish brown muck in the lower part. The underlying material to a depth of about 80 inches is dark gray loamy sand in the upper part and light brownish gray sandy clay in the lower part.

The minor soils are Samsula, Floridana, Delray, Anclote, Chobee, and Felda soils. These soils are in landscape positions similar to those of the Gator and Terra Ceia soils. Ponding or flooding are major management concerns in areas of these soils.

Most areas of this map unit are in natural vegetation. The area around Long Island Marsh has been cleared and drained and is used for truck crops. The soils of this map unit provide good habitat for wildlife.

8. Durbin-Wulfert

Nearly level, very poorly drained soils that are organic to a depth of 16 to more than 51 inches and are underlain by sandy material; subject to frequent flooding by tides

In this map unit, the landscape is tidal marshes and swamps. Areas of this map unit are located on the Peace River flood plain in the southern part of the county. The soils of this map unit are flooded daily by high tides. The natural vegetation in the tidal marshes is sawgrass, bulrush, elephant ear, and other salt-tolerant grasses and shrubs.

This map unit makes up 1,266 acres, or less than 1 percent of the county. It is dominantly Durbin and Wulfert soils, and no soils of minor extent are mapped.

Typically, the Durbin soils have a very dark brown muck surface layer about 4 inches thick. The next layer to a depth of 75 inches is black muck. The underlying material to a depth of about 80 inches is brown sand.

Typically, the Wulfert soils have a dark reddish brown muck surface layer about 4 inches thick. The next layer to a depth of about 26 inches is very dark grayish brown muck. The underlying material to a depth of about 80 inches is grayish brown sand in the upper part and light brownish gray fine sand in the lower part.

Most areas of this map unit remain in native vegetation and provide good habitat for wildlife.

9. Bradenton-Felda-Chobee

Nearly level, poorly drained and very poorly drained soils that are sandy to a depth of 20 to 40 inches and underlain by loamy material or that are loamy throughout; subject to flooding

In this map unit, the landscape is low first bottoms of rivers and streams. Areas of this map unit are interspersed with shallow river and creek channels and are flooded frequently. They are along streams and rivers throughout the county but are dominantly adjacent to the Peace River and Horse Creek. The natural vegetation is dense and consists of water oak, cypress, cabbage palm, sweetgum, hickory, red maple, cutgrass, maidencane, sawgrass, swamp primrose, buttonbush, smartweed, sedges, and other water-tolerant plants.

This map unit makes up 19,358 acres, or about 5 percent of the county. It is about 44 percent Bradenton-Felda-Chobee complex, frequently flooded; 33 percent Bradenton-Felda-Chobee complex, occasionally flooded; and 23 percent soils of minor extent.

Bradenton soils are poorly drained. Typically, they have a dark gray fine sand surface layer about 3 inches thick. The subsurface layer to a depth of about 10 inches is light brownish gray fine sand. The subsoil to a depth of about 65 inches is fine sandy loam that is brown in the upper part and light brownish gray in the lower part. The substratum to a depth of about 80 inches is light gray loamy fine sand in the upper part and white fine sand in the lower part.

Felda soils are poorly drained. Typically, they have a dark gray fine sand surface layer about 8 inches thick. The subsurface layer to a depth of about 30 inches is fine sand that is gray in the upper part and light brownish gray in the lower part. The subsoil extends to a depth of about 75 inches. It is grayish brown fine sandy loam in the upper part and light brownish gray sandy clay loam in the lower part. The substratum to a depth of about 80 inches is light gray loamy sand.

Chobee soils are very poorly drained. Typically, they have a very dark gray loamy fine sand surface layer about 18 inches thick. The subsoil to a depth of about 68 inches is very dark gray fine sandy loam in the upper part, dark gray sandy clay loam in the middle part, and gray fine sandy loam in the lower part. The substratum to a depth of about 80 inches is gray loamy sand.

The minor soils are Bradenton, Felda, and Wabasso soils that are not subject to flooding. These soils are in higher positions than those of the major soils. They are important sites for uses that are affected by the flooding of the major soils.

The soils of this map unit are used mainly as range or native pasture. Small areas have been cleared and are used as improved pasture. These soils provide habitat for wildlife.

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, Basinger fine sand, depressional, is one of several phases in the Basinger series.

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

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

An *undifferentiated group* is made up of two or more soils that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils in a mapped area are not uniform. An area can be made up of only one of the major soils, or it can be made up of all of them. Durbin and Wulfert mucks, frequently flooded, 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. 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—Anclote mucky fine sand, depressional. This soil is deep, nearly level, and very poorly drained. It is in depressions. Slope is 0 to 1 percent.

Typically, the surface layer is about 14 inches thick. The upper 10 inches is black mucky fine sand, and the lower part is black fine sand. The underlying material to a depth of about 80 inches is fine sand. It is gray in the upper part, grayish brown in the middle part, and light brownish gray in the lower part.

Included with this soil in mapping are small areas of Basinger, Floridana, and Valkaria soils. Basinger and Valkaria soils do not have a thick, dark colored sandy surface layer, and they generally are near the edges of delineations. In addition, Basinger soils have a slightly darkened subsoil, and Valkaria soils have a brightly colored subsoil. Floridana soils have a loamy subsoil. These soils are in landscape positions similar to those of the Anclote soil. The included soils make up about 15 percent of the map unit.

This Anclote soil has a high water table that usually covers the surface for 6 months or more. The available water capacity is moderate. The permeability is rapid.

In its natural condition, this soil is not suited to cultivated crops, pasture, or citrus. The high water table, which is above the surface much of the year, severely restricts plant growth. Establishing an adequate water control system is difficult because suitable outlets are not available in most locations; however, if a system can be installed, this soil can be made suitable for improved pasture grasses that tolerate wetness.

Typically, this soil is characterized by the Freshwater Marshes and Ponds range site. This site can be identified by 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 long periods. If this range site is properly managed, using such practices as proper stocking, the potential forage production is higher than that of any other range site. Chalky bluestem and blue maidencane dominate the drier parts of the Freshwater Marshes and Ponds range site, and maidencane is dominant in the wetter parts. Other desirable forage plants include cutgrass, bluejoint panicum, sloughgrass, and low panicums. Periodic high water levels provide a natural deferment from excessive grazing. Carpetgrass, an introduced plant, tends to dominate the drier parts of this site under excessive grazing conditions.

This soil is not suited to commercial pine tree production because of ponding. Outlets generally are not available, and drainage is not practical in these areas. Baldcypress has been planted in a few areas of this soil.

This soil is not suited to urban development.

The Anclote soil is in capability subclass VIIw.

3—Basinger fine sand. This soil is deep, nearly level, and poorly drained. It is in sloughs. Slope is 0 to 1 percent.

Typically, the Basinger soil has a dark gray fine sand surface layer about 5 inches thick. The subsurface layer to a depth of about 22 inches is light gray fine sand. The next layer to a depth of 30 inches is gray fine sand. The subsoil to a depth of 54 inches is dark brown fine sand. The substratum to a depth of about 80 inches is yellowish brown fine sand.

Included with this soil in mapping are small areas of Myakka, Immokalee, EauGallie, and Valkaria soils. Myakka, Immokalee, and EauGallie soils are in slightly higher positions on the landscape than the Basinger soil. Myakka and Immokalee soils have a better developed subsoil, and EauGallie soils have a loamy subsoil below a depth of 40 inches. Valkaria soils are in landscape positions similar to those of the Basinger soil and have a brownish yellow sandy subsoil. The included soils make up about 15 percent of the map unit.

This Basinger soil has a high water table within a depth of 12 inches for 2 to 4 months during most years. During periods of high rainfall, the surface is covered by shallow, slowly moving water for 1 to 7 days or more. The available water capacity is low. The permeability is rapid.

This soil is well suited to pasture. Excessive water on the surface can be removed by shallow ditches. Fertilizer and lime are needed for optimum growth of grasses and legumes. Suitable pasture plants are panolagrass, improved bahiagrass, and limpograss. Grazing management, brush control, protection from wildfire, and proper location of stockwater and fences are needed.

Typically, this soil is characterized by the Slough range site. This site can be identified by an open expanse of grasses, sedges, and rushes in an area where the soil is saturated during the rainy season. If this range site is properly managed, using such practices as deferred grazing, the potential for forage production is almost as high as that of the Freshwater Marshes and Ponds range site. Desirable forage plants include blue maidencane, maidencane, chalky bluestem, toothachegrass, and South Florida bluestem. Carpetgrass, an introduced plant, tends to dominate this site under excessive grazing conditions.

In its natural condition, this Basinger soil is poorly suited to cultivated crops because of wetness and poor soil quality. Only a limited number of crops can be grown unless very intensive management practices are used; however, this soil can be made suitable for several vegetable crops. A water control system is needed to remove excess water in wet seasons and to provide water for subsurface irrigation in dry seasons.

In its natural condition, this soil is poorly suited to citrus. It can be made suitable for citrus by installing a water control system that maintains the water table at an effective depth. Trees should be planted on beds to increase the effective depth to the water table, and a plant cover needs to be maintained between the trees. Fertilizer and lime are needed on a regular basis.

This soil has moderate potential productivity for slash pine. Equipment limitations, seedling mortality, and plant competition are major concerns in management. Bedding of rows helps in establishing seedlings by increasing the depth to the water table.

In its natural condition, this soil is poorly suited to urban development. Drainage is needed to overcome wetness, and fill material is needed for most urban uses. Preserving the existing plant cover during construction helps to control erosion.

This Basinger soil is in capability subclass IVw.

4—Basinger fine sand, frequently flooded. This soil is deep, nearly level, and poorly drained. It is adjacent to streams and well defined drainageways. Slope is 0 to 2 percent.

Typically, this Basinger soil has a dark gray fine sand surface layer about 4 inches thick. The subsurface layer to a depth of about 16 inches is light brownish gray fine sand. The subsoil to a depth of 36 inches is dark grayish brown fine sand. The substratum to a depth of about 80 inches is fine sand. It is grayish brown in the upper part and light gray in the lower part.

Included with this soil in mapping are small areas of Malabar, Pompano, and Valkaria soils. These soils are in landscape positions similar to those of the Basinger soil. Malabar soils have loamy material below a depth of about 40 inches. Pompano soils do not have a dark subsoil, and Valkaria soils have a brightly colored subsoil. The included soils make up about 15 percent of the map unit.

This Basinger soil has a high water table within a depth of 12 inches for 2 to 4 months during most years. Flooding occurs in most years. The available water capacity is low. The permeability is rapid.

The natural vegetation is mainly slash pine, laurel oak, live oak, cabbage palm, saw palmetto, and pineland threeawn.

In its natural condition, this soil is not suited to cultivated crops, citrus trees, or improved pasture because of the hazard of flooding. It is moderately suited to improved pasture grasses if excess water is removed. A water control system is needed to remove excess surface water after heavy rains, and flooding should be controlled. Suitable pasture plants are pangolagrass, improved bahiagrass, and white clover. Fertilizer and lime are needed for optimum growth of grasses and legumes. Proper stocking, pasture rotation, and timely deferment of grazing help keep the pasture in good condition.

This soil has moderate potential productivity for slash pine if water control measures are used. Equipment limitations, seedling mortality, and plant competition are major concerns in management. Bedding of rows helps in establishing seedlings by increasing the depth to the water table.

This soil is not suited to urban development.

This Basinger soil is in capability subclass VIw. It is not assigned to a range site.

5—Basinger fine sand, depressional. This soil is deep, nearly level, and very poorly drained. It is in depressions. Slope is 0 to 1 percent.

Typically, this Basinger soil has a black fine sand surface layer about 2 inches thick. The subsurface layer to a depth of about 34 inches is fine sand. It is grayish brown in the upper part and light gray in the lower part. The subsoil to a depth of about 45 inches is mixed grayish brown and black fine sand. The substratum to a depth of about 80 inches is fine sand. It is pale brown in the upper part and light gray in the lower part.

Included with this soil in mapping are small areas of Anclote, Floridana, and Pompano soils. Anclote and Floridana soils are in lower positions within the depressions. Anclote soils have a thick, dark colored surface layer. Floridana soils have a loamy subsoil. Pompano soils are in positions similar to those of the Basinger soil. They do not have a slightly darkened subsoil layer and are sandy throughout. The included soils make up about 15 percent of the map unit.

This Basinger soil has a high water table that usually covers the surface for 6 months or more. The available water capacity is low. The permeability is rapid.

In its natural condition, this soil is not suited to cultivated crops, pasture, or citrus. The high water table severely restricts plant growth. Establishing an adequate water control system is difficult because suitable outlets are not available in most locations; however, if a system can be installed, this soil can be made suitable for improved pasture grasses that tolerate wetness.

Typically, this soil is characterized by the Freshwater Marshes and Ponds range site. This site can be identified by 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 long periods. If this range site is properly managed, using such practices as proper stocking, the potential for forage production is higher than that of any other range site. Chalky bluestem and blue maidencane dominate the drier parts of the Freshwater Marshes and Ponds range site, and maidencane is dominant in the wetter parts. Other desirable forage plants include cutgrass, bluejoint panicum, sloughgrass, and low panicums. Periodic high water levels provide a natural deferment from excessive grazing. Carpetgrass, an introduced plant, tends to dominate the drier parts of this range site under excessive grazing conditions.

This soil is not suited to commercial pine tree production because of ponding. Outlets generally are not available, and drainage is not practical. Baldcypress has been planted in a few areas of this soil.

This soil is not suited to urban development.

This Basinger soil is in capability subclass VIIw.

6—Bradenton fine sand. This soil is deep, nearly level, and poorly drained. It is on low-lying hammocks.

Typically, this Bradenton soil has a dark gray fine sand surface layer about 4 inches thick. The subsurface layer to a depth of about 15 inches is fine sand that is gray in the upper part and grayish brown in the lower part. The subsoil to a depth of about 26 inches is light brownish gray fine sandy loam. The substratum to a depth of about 80 inches is loamy fine sand that is gray in the upper part and dark gray and gray in the lower part.

Included with this soil in mapping are small areas of Felda and Wabasso soils. These soils are in positions similar to those of the Bradenton soil. Felda soils have a sandy surface layer 20 to 40 inches thick. Wabasso soils have a dark colored subsoil within 20 to 30 inches of the surface. The included soils make up about 15 percent of the map unit.

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

This soil is well suited to pasture. Excessive water on the surface can be removed by shallow ditches. Fertilizer and lime are needed for optimum growth of grasses and legumes. Suitable pasture plants are pangolagrass, improved bahiagrass, and white clover. Grazing management, brush control, protection from wildfire, and proper location of stockwater and fences are needed.

Typically, this soil is characterized by the Cabbage Palm Hammock range site. This site is readily identified by thick stands of cabbage palm with a few scattered oak (fig. 4). It occurs in slightly elevated areas within the Slough and South Florida Flatwoods range sites. The dense canopy and relatively open understory provide shade and resting areas for cattle. Desirable forage plants on this site include chalky bluestem, creeping bluestem, switchgrass, low panicum, and south Florida bluestem.

In its natural condition, this soil is poorly suited to cultivated crops because of wetness and poor soil quality. Only a limited number of crops can be grown unless very intensive management practices are used; however, this soil can be made suitable for several vegetable crops. A water control system is needed to remove excess water in wet seasons and to provide water for subsurface irrigation in dry seasons. Flow-through and micro-jet irrigation systems work well on this soil. The organic matter content can be maintained by using all crop residue, by plowing under cover crops, and by using a suitable cropping system. Crops respond well to lime and fertilizer. Cucumbers, bell peppers, squash, watermelons, and citrus are the main crops grown.

In its natural condition, this soil is poorly suited to citrus. It can be made suitable by installing a water control system that maintains the water table at an effective depth. Trees should be planted on beds to increase the effective depth to the water table, and a plant cover needs to be maintained between the trees. Fertilizer and lime are needed on a regular basis.

This soil has high potential productivity for slash pine. Equipment limitations, seedling mortality, and plant competition are major concerns in management. Bedding of rows helps in establishing seedlings by increasing the depth to the water table.

In its natural condition, this soil is poorly suited to urban development because of wetness. It can be made suitable by using the proper water control system. Drainage is needed to overcome wetness, and fill material is needed for most urban uses. Preserving the existing plant cover during construction helps to control erosion.

This Bradenton soil is in capability subclass IIIw.

7—Bradenton-Felda-Chobee complex, occasionally flooded. These soils are nearly level and are poorly drained to very poorly drained. They are on flood plains of rivers and streams. The areas of these Bradenton, Felda, and Chobee soils are too intricately mixed to be mapped separately at the selected scale. Slope is 0 to 2 percent.

This complex is about 40 percent Bradenton soil, about 30 percent Felda soil, about 15 percent Chobee soil, and about 15 percent other soils.

Typically, this Bradenton soil has a dark gray fine sand surface layer about 3 inches thick. The subsurface layer to a depth of about 10 inches is light brownish

Figure 4.—The native vegetation on Bradenton fine sand is mainly a thick stand of cabbage palms.

gray fine sand. The subsoil to a depth of about 65 inches is fine sandy loam that is brown in the upper part and light brownish gray in the lower part. The upper part of the substratum is light gray loamy fine sand. The lower part to a depth of about 80 inches is white fine sand.

This Bradenton soil has a high water table within a depth of 12 inches for 1 to 4 months during most years. The available water capacity is moderate. The permeability is moderate. On the average, flooding occurs less than once every 2 years. The duration and extent of flooding are variable and are related directly to the intensity and frequency of rainfall.

Typically, this Felda soil has a dark gray fine sand surface layer about 8 inches thick. The subsurface layer to a depth of about 30 inches is gray fine sand. The subsoil to a depth of about 75 inches is grayish brown fine sandy loam in the upper part and light brownish gray sandy clay loam in the lower part. The substratum to a depth of 80 inches is light gray loamy sand.

This Felda soil has a high water table within a depth of 12 inches for 2 to 4 months during most years. The available water capacity is low. The permeability is moderate or moderately rapid. On the average, flooding occurs less than once every 2 years.

Typically, this Chobee soil has a very dark gray surface layer about 18 inches thick. It is mucky loamy fine sand in the upper part and grades to loamy fine sand in the lower part. The subsoil to a depth of about 68 inches is very dark gray fine sandy loam in the upper part, dark gray sandy clay loam in the middle part, and gray fine sandy loam in the lower part. The substratum to a depth of about 80 inches is gray loamy sand.

This Chobee soil has a high water table that usually covers the surface for 6 months or more. The available water capacity is moderate. The permeability is slow or very slow.

Included with these soils in mapping are small areas of Floridana, Pompano, and Wabasso soils. Floridana soils are in depressions and have a loamy subsoil between 20 and 40 inches of the surface. Pompano soils are in higher positions on flood plains and are dominantly adjacent to the stream. Wabasso soils are also in higher positions on the flood plain and have a dark colored subsoil underlying a loamy layer. Soils that are frequently flooded are in some lower lying areas.

The natural vegetation is mostly water oak, live oak, red maple, blackgum, and scattered saw palmetto. Pickerelweed is dominant in most of the depressional areas.

The Bradenton, Felda, and Chobee soils are only moderately suited to pasture because of the potential hazard of flooding. Fertilizer and lime are needed for optimum growth of grasses and legumes. Suitable pasture plants are pangolagrass and improved bahiagrass.

These soils are not used for cultivated crops and citrus because of the potential hazard of flooding.

The Bradenton soil has high potential productivity for slash pine, and the Felda soil has moderately high potential productivity. The Chobee soil is not suited to commercial pine tree production. Equipment limitations, seedling mortality, and plant competition are the main concerns in managing the soils in this complex for timber production. Bedding of rows helps in establishing seedlings by increasing the depth to the water table. Baldcypress has been planted in a few areas of the Chobee soil.

These soils are not suited to urban development because of the hazard of flooding (fig. 5).

The Bradenton, Felda, and Chobee soils are in capability subclass IIIw. Ponded areas of the Chobee soil would be in capability subclass VIIw if mapped separately. The soils in this complex are not assigned to a range site.

8—Bradenton-Felda-Chobee complex, frequently flooded. These soils are nearly level and are poorly drained to very poorly drained. They are on flood plains of rivers and streams. The areas of these Bradenton, Felda, and Chobee soils are too intricately mixed to be mapped separately at the selected scale. Slope is 0 to 2 percent.

This complex is about 35 percent Bradenton soil, about 35 percent Felda soil, about 15 percent Chobee soil, and about 15 percent other soils.

Typically, this Bradenton soil has a dark gray fine sand surface layer about 3 inches thick. The subsurface layer to a depth of about 10 inches is light brownish gray fine sand. The subsoil to a depth of about 65 inches is fine sandy loam that is brown in the upper part and light brownish gray in the lower part. The upper part of the substratum is light gray loamy fine sand. The lower part to a depth of about 80 inches is white fine sand.

This Bradenton soil has a high water table within a depth of 12 inches for 1 to 4 months during most years. The available water capacity is moderate. The permeability is moderate. Flooding occurs frequently during the rainy season. The duration and extent of flooding are variable and are related directly to the intensity and frequency of rainfall.

Typically, this Felda soil has a dark gray fine sand surface layer about 8 inches thick. The subsurface layer to a depth of about 30 inches is fine sand that is gray in the upper part and light brownish gray in the lower part. The subsoil to a depth of about 75 inches is grayish brown fine sandy loam in the upper part and light brownish gray sandy clay loam in the lower part. The substratum to a depth of about 80 inches is light gray loamy sand.

This Felda soil has a high water table within a depth of 12 inches for 2 to 4 months during most years. The available water capacity is low. The permeability is moderate or moderately rapid. Flooding occurs frequently during the rainy season.

Typically, this Chobee soil has a very dark gray loamy fine sand surface layer about 18 inches thick. The subsoil to a depth of about 68 inches is very dark gray fine sandy loam in the upper part, dark gray sandy clay loam in the middle part, and gray fine sandy loam in the lower part. The substratum to a depth of about 80 inches is gray loamy sand.

Figure 5.—Bradenton-Felda-Chobee complex, occasionally flooded, is not suitable for urban development because of flooding.

This Chobee soil has a high water table within a depth of 12 inches for 3 to 9 months during most years. Flooding in most years is for a very long duration. The available water capacity is moderate. The permeability is slow or very slow.

Included with these soils in mapping are small areas of Pompano, Floridana, and Terra Ceia soils. Pompano soils are in higher positions on flood plains, occur dominantly adjacent to the stream, and are sandy to a depth of 80 inches. Floridana soils are in depressions and have a loamy subsoil between 20 and 40 inches of the surface. Terra Ceia soils are in lower positions on flood plains and have organic material to a depth of more than 51 inches. In places are soils that have a loamy subsoil more than 40 inches below the surface. Some areas of occasionally and rarely flooded soils occur dominantly on the outer edge of flood plains away from the stream.

The natural vegetation is mostly red maple, water oak, live oak, and blackgum. Pickerelweed is dominant in some of the wetter areas.

The Bradenton, Felda, and Chobee soils are only moderately suited to pasture because of the potential hazard of flooding. Fertilizer and lime are needed for optimum growth of grasses and legumes. Suitable pasture plants are pangolagrass and improved bahiagrass.

These soils are not suited to cultivated crops and citrus because of the potential hazard of flooding.

The Bradenton soil has high potential productivity for slash pine, and the Felda soil has moderately high potential productivity. Equipment limitations, seedling mortality, and plant competition are the main concerns in producing and harvesting timber on these soils. Bedding of rows helps in establishing seedlings by increasing the depth to the water table. The Chobee soil is not suited to commercial pine tree production; however, baldcypress is planted in a few areas of this soil.

These soils are not suited to urban development because of the hazard of flooding.

The Bradenton, Felda, and Chobee soils are in capability subclass Vw. These soils are not assigned to a range site.

9—Cassia fine sand. This soil is deep, nearly level, and poorly drained. It is on low-lying knolls on flatwoods. Slope is 0 to 2 percent.

Typically, this Cassia soil has a gray fine sand surface layer about 3 inches thick. The subsurface layer is gray fine sand to a depth of about 22 inches. The upper part of the subsoil to a depth of about 28 inches is dark reddish brown fine sand. The next layer to a depth of about 40 inches is dark brown fine sand. To a depth of about 55 inches, the soil is pale brown fine sand. The lower part of the subsoil to a depth of about 80 inches is fine sand that is dark grayish brown in the upper part and very dark grayish brown in the lower part.

Included with this soil in mapping are small areas of Myakka, Pomello, and Zolfo soils. Myakka soils are in lower positions on the landscape than the Cassia soil. Pomello soils are in higher positions and have a sandy subsoil between 30 and 50 inches below the surface. Zolfo soils are in landscape positions similar to those of the Cassia soil and have a sandy subsoil more than 50 inches below the surface. The included soils make up about 15 percent of the map unit.

This Cassia soil has a high water table at a depth of 18 to 42 inches for 1 to 4 months during most years. The available water capacity is low. The permeability is moderate or moderately rapid.

This soil is only moderately suited to pasture because of droughtiness and very low fertility. Fertilizer and lime are needed for optimum growth of grasses and legumes. Suitable pasture plants are pangolagrass and bahiagrass.

Typically, this soil is characterized by the Sand Pine Scrub range site. This site can be identified by a fairly dense stand of sand pine trees and a dense understory of oaks, saw palmetto, and other shrubs. Because of past timber management practices, sand pines are not in all areas of this range site. The droughty nature of this soil limits the potential for producing native forage. If this range site is properly managed, using such practices as deferred grazing and brush control, it has the potential to produce limited amounts of lopsided indiangrass, creeping bluestem, and beaked panicum. Livestock generally does not use this range site if more productive sites are available. Summer shade, winter protection, and dry bedding during the wet seasons are provided on this range site.

In its natural condition, this soil is not suited to cultivated crops because of droughtiness and poor soil quality; however, it can be made suitable by supplying sufficient water with a well designed irrigation system and by adding sufficient nutrients for plant growth. Crop residue left on or near the surface helps to conserve moisture, maintain tilth, and control erosion. Frequent applications of fertilizer and lime generally are needed to improve soil quality.

In its natural condition, this soil is poorly suited to citrus. It can be made suitable by installing a water control system that maintains the water table at an effective depth. Trees should be planted on beds to increase the effective depth to the water table, and a plant cover should be maintained between the trees. Fertilizer and lime are needed on a regular basis.

This soil has moderate potential productivity for slash pine. Equipment limitations, seedling mortality, and plant competition are major concerns in management.

Because of wetness, this soil is only moderately suited to urban development. Proper drainage is needed to overcome wetness, and fill material is needed for most urban uses.

This Cassia soil is in capability subclass VIs.

10—Chobee muck, depressional. This soil is deep, nearly level, and very poorly drained. It is in depressions. Slope is 0 to 1 percent.

Typically, this Chobee soil has a dark reddish brown muck surface layer about 2 inches thick. The next layer to a depth of about 7 inches is black sandy clay loam. The subsoil to a depth of about 65 inches is black sandy clay loam in the upper part and grayish brown fine sandy loam in the lower part. The substratum to a depth of about 80 inches is greenish gray fine sand.

Included with this soil in mapping are small areas of Delray, Felda, Floridana, and Gator soils. Delray soils are in landscape positions similar to those of the Chobee soil and have loamy material more than 40 inches below the surface. Felda soils are in slightly higher positions generally near the edge of delineations. They do not have a thick, dark surface layer or loamy material within 20 inches of the surface. Floridana soils are in positions similar to those of the Chobee soil and have loamy material within 20 to 40 inches of the surface. Gator soils are in the lowest positions, and they are organic. In places are soils similar to the Chobee soil except they do not have a significant increase in clay within the subsoil. The included soils make up about 15 percent of the map unit.

This Chobee soil has a high water table that usually covers the surface for 6 months or more. The available water capacity is moderate. The permeability is slow or very slow.

In its natural condition, this soil is not suited to cultivated crops, pasture, or citrus. The high water table severely restricts plant growth. Establishing an adequate water control system is difficult because suitable outlets are not available in most locations; however, if a system can be installed, this soil can be made suitable for improved pasture grasses that tolerate wetness.

This soil is characterized by the Freshwater Marshes and Ponds range site. This site can be identified by 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 long periods. If this range site is properly managed, using such practices as proper stocking, the potential for forage production is higher than that of any other range site. Chalky bluestem and blue maidencane dominate the drier parts of the Freshwater Marshes and Ponds range site, and maidencane is dominant in the wetter parts. Other desirable forage plants include cutgrass, bluejoint panicum, sloughgrass, and low panicums. Periodic high water levels provide a natural deferment from excessive grazing. Carpetgrass, an introduced plant, tends to dominate the drier parts of this site under excessive grazing conditions.

This soil is not suited to commercial pine tree production; however, baldcypress has been planted in a few areas.

This soil is not suited to urban development.

This Chobee soil is in capability subclass VIIw.

11—Delray mucky fine sand, depressional. This soil is deep, nearly level, and very poorly drained. It is in depressions. Slope is 0 to 1 percent.

Typically, this Delray soil has a black mucky fine sand surface layer about 23 inches thick. The subsurface layer to a depth of about 65 inches is fine sand that is grayish brown in the upper part and gray in the lower part. The subsoil extends to a depth of 80 inches or more. It is grayish brown fine sandy loam in the upper part, gray fine sandy loam in the middle part, and gray loamy sand in the lower part.

Included with this soil in mapping are small areas of Anclote, Gator, and Samsula soils. Anclote soils are in landscape positions similar to those of the Delray soil and are sandy throughout. Gator and Samsula soils are in the lowest positions. Gator soils are organic soils that have loamy material within 51 inches of the surface. Samsula soils are organic soils that have sandy material within 51 inches of the surface. In places are soils similar to the Delray soil except they have a dark colored surface layer that is more than 24 inches thick. The included soils make up about 15 percent of the map unit.

This Delray soil has a high water table that usually covers the surface for 6 months or more. The available water capacity is moderate. The permeability is moderate or moderately rapid.

In its natural condition, this soil is not suited to cultivated crops, pasture, or citrus. The high water table severely restricts plant growth. Establishing an adequate water control system is difficult because suitable outlets are not available in most locations; however, if a system can be installed, this soil can be made suitable for improved pasture grasses that tolerate wetness.

Typically, this soil is characterized by the Freshwater Marshes and Ponds range site. This site can be identified by 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 long periods. If this range site is properly managed, the potential for forage production is higher than that of any other range site. Chalky bluestem and blue maidencane dominate the drier parts of the Freshwater Marshes and Ponds range site, and maidencane is dominant in the wetter parts. Other desirable forage plants include cutgrass, bluejoint panicum, sloughgrass, and low panicums. Periodic high water levels provide a natural deferment from excessive grazing. Carpetgrass, an introduced plant, tends to dominate the drier parts of this site under excessive grazing conditions.

This soil is not suited to commercial pine tree production because of ponding. Outlets generally are not available, and drainage is not practical. Baldcypress has been planted in a few areas of this soil.

This soil is not suited to urban development.

This Delray soil is in capability subclass VIIw.

12—Durbin and Wulfert mucks, frequently flooded. These soils are nearly level and very poorly drained. They are on the tidal-influenced part of the Peace River flood plain in the southernmost part of the county. The Durbin and Wulfert soils do not occur in a regular and repeating pattern. Individual areas of each soil are large enough to map separately; however, because of present and predicted use, they were not separated in mapping. Slope is 0 to 2 percent.

This map unit is about 50 percent Durbin soil, 45 percent Wulfert soil, and 5 percent other soils.

Typically, this Durbin soil has a very dark brown muck surface layer about 4 inches thick. The next layer to a depth of about 75 inches is black muck. The underlying material to a depth of about 80 inches is brown sand.

Typically, this Wulfert soil has a dark reddish brown muck surface layer about 4 inches thick. The next layer to a depth of about 26 inches is very dark grayish brown muck. The underlying material is grayish brown sand in the upper part. The lower part to a depth of about 80 inches is light brownish gray fine sand.

Durbin and Wulfert soils are flooded daily by high tides. The available water capacity is very high or high for salt-tolerant plants. The permeability is rapid.

Included in this map unit are small areas of Samsula and Terra Ceia soils. These soils are on the flood plain, and the content of sulfur is low. Samsula soils have organic material that is less than 51 inches thick, and Terra Ceia soils have organic material that is more than 51 inches thick. Some better drained soils that are occasionally or rarely flooded are in elongated areas adjacent to the stream.

The Durbin and Wulfert soils are not suitable for pasture, crops, citrus, pine trees, or urban development because of flooding during high tides.

Typically, the Durbin soil is characterized by the Salt Marsh range site. This site can be identified by level, tidal marsh areas. It has potential for producing significant amounts of smooth cordgrass, marshhay cordgrass, seashore saltgrass, and numerous other forage grasses and forbs.

Because tidal action saturates these soils with salt water to a depth of a few inches, some areas are soft and cannot support the weight of a large animal. In areas that are suitable for grazing, the potential for producing desirable forage is almost as high as on a freshwater marsh. Proper stocking is needed. Poorly managed salt marshes generally are dominated by rushes and sawgrass.

These Durbin and Wulfert soils are in capability subclass VIIIw.

13—EauGallie fine sand. This soil is deep, nearly level, and poorly drained. It is on flatwoods. Slope is 0 to 2 percent.

Typically, this EauGallie soil has a very dark gray fine sand surface layer about 7 inches thick. The subsurface layer to a depth of 29 inches is fine sand that is gray in the upper part and light gray in the lower part. The subsoil to a depth of about 47 inches is fine sand that is black in the upper part and dark brown in the lower part. The next layer to a depth of about 68 inches is yellowish brown fine sand. To a depth of about 80 inches, the subsoil is grayish brown fine sandy loam underlain by light olive gray sandy clay loam.

Included with this soil in mapping are small areas of Myakka, Immokalee, Farmton, and Wabasso soils. Myakka soils are in landscape positions similar to those of the EauGallie soil, but they do not have a loamy subsoil. The Immokalee and Farmton soils are in slightly higher positions on the landscape and have a well developed subsoil between 30 and 50 inches below the surface. Wabasso soils have a loamy subsoil less than 40 inches below the surface. The included soils make up about 15 percent of the map unit.

This EauGallie soil has a high water table within a depth of 12 inches for 1 to 4 months during most years. The available water capacity is low. The permeability is slow or moderately slow.

This soil is well suited to pasture. Excessive water on the surface can be removed by shallow ditches. Fertilizer and lime are needed for optimum growth of grasses and legumes. Suitable pasture plants are pangolagrass, improved bahiagrass, and white clover. Grazing management, brush control, protection from wildlife, and proper location of stockwater and fences are needed.

Typically, this soil is characterized by the South Florida Flatwoods range site. This site can be identified by scattered pine trees and an understory of saw palmetto and grasses. If this range site is properly managed, using such practices as deferred grazing and brush control, it has the potential to produce significant amounts of creeping bluestem, lopsided indiangrass, chalky bluestem, and various panicums. As range deterioration occurs because of poor grazing management, this site is dominated by saw palmetto and pineland threeawn (wiregrass).

Figure 6.—Irrigation and drainage furrows and windrow protection for young plants improve the suitability of EauGallie fine sand for vegetable crops.

The EauGallie soil is poorly suited to cultivated crops because of wetness and poor soil quality. Only a limited number of crops can be grown unless very intensive management practices are used. With good water control and soil-improving measures, this soil can be made suitable for several vegetable crops (fig. 6). A water control system is needed to remove excess water in wet seasons and to provide water for subsurface irrigation in dry seasons. Row crops should be rotated with close-growing, soil-improving crops that are on the land three-fourths of the time. Crop residue and soil-improving crops should be used to maintain organic matter content. Seedbed preparation should include bedding of the rows. Fertilizer and lime should be added according to the need of the crops. Cucumbers, watermelons, bell peppers, and squash are the main crops grown.

This soil is poorly suited to citrus unless it is intensively managed for this use. A carefully designed water control system must be installed to maintain the water table at an effective depth. Trees should be planted on beds to increase the effective depth to the water table, and a plant cover needs to be maintained between the trees. Fertilizer and lime are needed on a regular basis.

This soil has moderately high potential productivity for slash pine. Equipment limitations, seedling mortality, and plant competition are major concerns in management. Bedding of rows helps in establishing seedlings by increasing the depth to the water table.

In its natural condition, this soil is poorly suited to urban development. Drainage is needed to overcome wetness, and fill material is needed for most urban uses. Preserving the existing plant cover during construction helps to control erosion.

This EauGallie soil is in capability subclass IVw.

14—Farmton fine sand. This soil is deep, nearly level, and poorly drained. It is on flatwoods. Slope is 0 to 2 percent.

Typically, this Farmton soil has a dark gray fine sand surface layer about 4 inches thick. The subsurface layer to a depth of about 34 inches is fine sand that is gray in the upper part and light gray in the lower part. The subsoil to a depth of 48 inches is fine sand that is black in the upper part, very dark gray in the middle part, and dark brown in the lower part. To a depth of about 80 inches, the subsoil is sandy clay loam that is light brownish gray in the upper part and pale olive in the lower part.

Included with this soil in mapping are small areas of Immokalee, Myakka, EauGallie, and Malabar soils. Immokalee soils are in landscape positions similar to those of the Farmton soil, and they do not have a loamy subsoil. Myakka, EauGallie, and Malabar soils are in slightly lower positions on the landscape. Myakka soils have a shallower subsoil and do not have loamy material in the lower part of the subsoil. The upper part of the subsoil in EauGallie soils is shallower than that of the Farmton soil. Malabar soils have a brightly colored subsoil. The included soils make up about 15 percent of the map unit.

This Farmton soil has a high water table within a depth of 12 inches for 1 to 4 months during most years. The available water capacity is low. The permeability is slow or very slow.

This soil is well suited to pasture. Excessive water on the surface can be removed by shallow ditches. Fertilizer and lime are needed for optimum growth of grasses and legumes. Suitable pasture plants are pangolagrass, improved bahiagrass, and white clover. Grazing management, brush control, protection from wildfire, and proper location of stockwater and fences are needed.

Typically, this soil is characterized by the South Florida Flatwoods range site. This site can be identified by scattered pine trees and an understory of saw palmetto and grasses. If this range site is properly managed, using such practices as deferred grazing and brush control, it has the potential to produce significant amounts of creeping bluestem, lopsided indiangrass, chalky bluestem, and various panicums. As range deterioration occurs because of poor grazing management, this site is dominated by saw palmetto and pineland threeawn (wiregrass).

In its natural condition, this soil is poorly suited to cultivated crops because of wetness and poor soil quality. Only a limited number of crops can be grown unless very intensive management practices are used; however, this soil can be made suitable for several vegetable crops. A water control system is needed to remove excess water in wet seasons and to provide water for subsurface irrigation in dry seasons. A flow-through irrigation system works well on this soil. The organic matter content can be maintained by using all crop residue, planting cover crops, and using a suitable cropping system. Crops respond to lime and fertilizer. Cucumbers, bell peppers, squash, and watermelons are the main crops grown.

In its natural condition, this Farmton soil is poorly suited to citrus. It can be made suitable by installing a carefully designed water control system that maintains the water table at an effective depth. Trees should be planted on beds to increase the effective depth to the water table, and a plant cover needs to be maintained between the trees. Fertilizer and lime are needed on a regular basis.

This soil has moderate potential productivity for slash pine. Equipment limitations, seedling mortality, and plant competition are major concerns in management. Bedding of rows helps in establishing seedlings by increasing the depth to the water table.

In its natural condition, this soil is poorly suited to urban development. Drainage is needed to overcome wetness, and fill material is needed for most urban uses. Preserving the existing plant cover during construction helps to control erosion.

This Farmton soil is in capability subclass IVw.

15—Felda fine sand. This soil is deep, nearly level, and poorly drained. It is in sloughs and on low-lying hammocks (fig. 7). Slope is 0 to 2 percent.

Typically, this Felda soil has a black fine sand surface layer about 7 inches thick. The subsurface layer to a depth of about 29 inches is fine sand that is grayish brown in the upper part and light gray in the

Figure 7.—Nesting and grazing for wildlife, particularly deer and turkey, are provided in most areas of Felda fine sand.

lower part. The subsoil to a depth of 42 inches is gray fine sandy loam. The substratum to a depth of about 80 inches is loamy sand that is gray in the upper part and light olive gray in the lower part.

Included with this soil in mapping are small areas of Bradenton, Pineda, Pinellas, and Malabar soils. These soils are in landscape positions similar to those of the Felda soil. Bradenton soils have a loamy subsoil within 20 inches of the surface. Pineda soils have yellowish horizons above a loamy subsoil. Pinellas soils have calcareous horizons. Malabar soils have a loamy subsoil at a depth of more than 40 inches. Small areas of Felda soils are in depressions. The included soils make up about 15 percent of the map unit.

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

This soil is well suited to pasture. Excessive water on the surface can be removed by shallow ditches. Fertilizer and lime are needed for optimum growth of grasses and legumes. Suitable pasture plants are pangolagrass, improved bahiagrass, and white clover. Grazing management, brush control, protection from wildfire, and proper location of stockwater and fences are needed.

Typically, this soil is characterized by the Slough range site. This site can be identified by an open expanse of grasses, sedges, and rushes in an area where the soil is saturated during the rainy season. If this range site is properly managed, using such practices as deferred grazing, the potential for forage production is almost as high as that of the Freshwater Marshes and Ponds range site. Desirable forage plants include blue maidencane, maidencane, chalky bluestem, toothachegrass, and South Florida bluestem. Carpetgrass, an introduced plant, tends to dominate this site under excessive grazing conditions.

In its natural condition, this Felda soil is poorly suited to cultivated crops because of wetness and poor soil quality. Only a limited number of crops can be grown unless very intensive management practices are used; however, this soil can be made suitable for several vegetable crops. A water control system is needed to remove excess water in wet seasons and to provide water for subsurface irrigation in dry seasons. Flow-through and micro-jet irrigation systems work well on this soil. The organic matter content can be maintained by using all crop residue, planting cover crops, and using a suitable cropping system. Crops respond well to lime and fertilizer. Cucumbers and watermelons are the main crops grown.

In its natural condition, this soil is poorly suited to citrus. It can be made suitable by installing a water control system that maintains the water table at an effective depth. Trees should be planted on beds to increase the effective depth to the water table, and a plant cover needs to be maintained between the trees. Fertilizer and lime are needed on a regular basis.

This soil has moderately high potential productivity for South Florida slash pine. Equipment limitations, seedling mortality, and plant competition are major concerns in management. Bedding of rows helps in establishing seedlings by increasing the depth to the water table.

In its natural condition, this soil is poorly suited to urban development. Drainage is needed to overcome wetness, and fill material is needed for most urban uses. Preserving the existing plant cover during construction helps to control erosion.

This Felda soil is in capability subclass IIIw.

16—Felda fine sand, frequently flooded. This soil is deep, nearly level, and poorly drained. It is adjacent to streams and well defined drainageways. Slope is 0 to 2 percent.

Typically, this Felda soil has a very dark gray fine sand surface layer about 5 inches thick. The subsurface layer to a depth of about 22 inches is fine sand that is grayish brown in the upper part and light brownish gray in the lower part. The subsoil to a depth of about 65 inches is fine sandy loam. It is grayish brown in the upper part, dark grayish brown in the middle part, and light brownish gray in the lower part. The substratum to a depth of about 80 inches is light gray sand.

Included with this soil in mapping are small areas of Basinger, Pineda, and Pompano soils. These soils are in landscape positions similar to those of the Felda soil. Basinger soils have a slightly darkened subsoil and are sandy throughout. Pineda soils have a brightly colored subsoil. Pompano soils do not have a subsoil and are sandy throughout. The included soils make up about 15 percent of the map unit.

This Felda soil has a high water table within a depth of 12 inches for 2 to 4 months during most years. Flooding occurs in most years. The available water capacity is low. The permeability is moderate or moderately rapid.

The natural vegetation is mostly slash pine, laurel oak, live oak, cabbage palm, saw palmetto, and pineland threeawn.

In its natural condition, this soil is not suited to pasture, cultivated crops, or citrus because of the hazard of flooding. It is moderately suited to improved pasture grasses if excess water is removed. A water control system is needed to remove excess surface water after heavy rains, and flooding should be controlled. Suitable pasture plants are pangolagrass, improved bahiagrass, and white clover. Fertilizer and lime are needed for optimum growth of grasses and legumes. Proper stocking, pasture rotation, and timely deferment of grazing help keep the pasture in good condition.

This soil has moderately high potential productivity for slash pine if water control measures are used. Equipment limitations, seedling mortality, and plant competition are major concerns in management. Bedding of rows helps in establishing seedlings by increasing the depth to the water table.

This soil is not suited to urban development.

This Felda soil is in capability subclass Vw. It is not assigned to a range site.

17—Felda fine sand, depressional. This soil is deep, nearly level, and very poorly drained. It is in depressions. Slope is 0 to 1 percent.

Typically, this Felda soil has a very dark gray fine sand surface layer about 6 inches thick. The subsurface layer to a depth of about 32 inches is fine sand that is light gray in the upper part and grayish brown in the lower part. The subsoil to a depth of about 49 inches is fine sandy loam that is grayish brown in the upper part and gray in the lower part. The substratum to a depth of about 80 inches is light gray fine sand.

Included with this soil in mapping are small areas of Basinger, Floridana, and Pineda soils. These soils are in landscape positions similar to those of the Felda soil. Basinger soils are sandy to a depth of 80 inches. Floridana soils have a thick, dark colored surface layer. Pineda soils have a brightly colored subsoil. The included soils make up about 15 percent of the map unit.

This Felda soil has a high water table that usually covers the surface for 6 months or more. The available water capacity is low. The permeability is moderate or moderately rapid.

In its natural condition, this soil is not suited to cultivated crops, pasture, or citrus. The high water table severely restricts plant growth. Establishing an adequate water control system is difficult because suitable outlets are not available in most locations; however, if a system can be installed, this soil can be made suitable for improved pasture grasses that tolerate wetness.

Typically, this soil is characterized by the Freshwater Marshes and Ponds range site. This site can be identified by 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 long periods. If this range site is properly managed, using such practices as proper stocking, the potential for forage production is higher than that of any other range site. Chalky bluestem and blue maidencane dominate the drier parts of the Freshwater Marshes and Ponds range site, and maidencane is dominant in the wetter parts. Other desirable forage plants include cutgrass, bluejoint panicum, sloughgrass, and low panicums. Periodic high water levels provide a natural deferment from extensive grazing. Carpetgrass, an introduced plant, tends to dominate the drier parts of this site under excessive grazing conditions.

This soil is not suited to commercial pine tree production because of ponding. Outlets generally are not available, and drainage is not practical. Baldcypress has been planted in a few areas of this soil.

This soil is not suited to urban development.

This Felda soil is in capability subclass VIIw.

18—Floridana mucky fine sand, depressional. This soil is deep, nearly level, and very poorly drained. It is in depressions. Slope is 0 to 1 percent.

Typically, this Floridana soil has a black mucky fine sand surface layer about 22 inches thick. The subsurface layer to a depth of about 34 inches is gray fine sand. The subsoil to a depth of about 45 inches is fine sandy loam that is gray in the upper part and greenish gray in the lower part. The substratum is gray loamy fine sand to a depth of 80 inches.

Included with this soil in mapping are small areas of Malabar, Felda, and Pineda soils. Malabar soils are in slightly higher positions generally near the outer edges of the delineation. These soils do not have a dark surface layer and have a loamy subsoil that is more than 40 inches below the surface. Felda soils are in depressions and do not have a dark surface layer. Pineda soils are in slightly higher positions on the landscape than the Floridana soil. These soils do not have a dark surface layer and have tonguing of the surface layer into the loamy subsoil. The included soils make up about 15 percent of the map unit.

This Floridana soil has a high water table that usually covers the surface for 6 months or more. The available water capacity is moderate. The permeability is slow or very slow.

In its natural condition, this soil is not suited to cultivated crops, pasture, or citrus. The high water table severely restricts plant growth. Establishing an adequate water control system is difficult because suitable outlets are not available in most locations; however, if a system can be installed, this soil can be made suitable for improved pasture grasses that tolerate wetness.

Typically, this soil is characterized by the Freshwater Marshes and Ponds range site. This site can be identified by 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 long periods. If this range site is properly managed, the potential for forage production is higher than that of any other range site. Chalky bluestem and blue maidencane dominate the drier parts of the Freshwater Marshes and Ponds range site, and maidencane is dominant in the wetter parts. Other desirable forage plants include cutgrass, bluejoint panicum, sloughgrass, and low panicums. Periodic high water levels provide a natural deferment from excessive grazing. Carpetgrass, an introduced plant, tends to dominate the drier parts of this site under excessive grazing conditions.

This soil is not suited to commercial pine tree production; however, baldcypress has been planted in a few areas.

This soil is not suited to urban development.

This Floridana soil is in capability subclass VIIw.

19—Gator muck, depressional. This soil is deep, nearly level, and very poorly drained. It is in marshes, swamps, and depressional areas. Slope is 0 to 1 percent.

Typically, this Gator soil has a black muck surface layer about 22 inches thick. The underlying material to a depth of about 80 inches is fine sandy loam. It is black and very dark grayish brown in the upper part, dark grayish brown in the middle part, and dark gray in the lower part.

Included with this soil in mapping are small areas of Floridana and Terra Ceia soils. Floridana soils are mineral soils that have a thick, dark colored surface layer and a loamy subsoil. These soils are in slightly higher positions on the landscape than the Gator soil. Terra Ceia soils are on the same landscape as that of the Gator soil and are muck to a depth of more than 51 inches. The included soils make up about 15 percent of the map unit.

This Gator soil has a high water table that usually covers the surface for 6 months or more. The available water capacity is high. The permeability is slow or very slow. If this soil is drained, the organic material initially shrinks on drying to about half the original thickness and then subsides further as a result of compaction and oxidation. These losses are most rapid during the first 2 years this soil is drained. If drainage is continued, this soil continues to subside at the rate of about 1 inch per year. The lower the water table, the more rapid the loss.

In its natural condition, this soil is not suited to improved pasture, cultivated crops, citrus, or commercial pine tree production. Baldcypress has been planted in a few areas of this soil.

If water is properly controlled, this soil can be made suitable for improved pasture. A water control system that maintains the water table near the surface helps to prevent excessive oxidation of the organic material. Suitable pasture plants are pangolagrass, improved bahiagrass, and white clover.

A well designed and maintained water control system can improve the suitability of this soil for cultivated crops. Excess water must be removed when crops are on the land, and the soil should be saturated with water the rest of the time. Fertilizers that contain phosphate, potash, and minor elements are needed. All crop residue and cover crops should be used to maintain organic matter content. Sorghum and sod are the main crops grown.

Typically, this soil is characterized by the Freshwater Marshes and Ponds range site. This site can be identified by 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 long periods. If this range site is properly managed, using such practices as proper stocking, the potential for forage production is higher than that of any other range site. Chalky bluestem and blue maidencane dominate the drier parts of the Freshwater Marshes and Ponds range site, and maidencane is dominant in the wetter parts. Other desirable forage plants include cutgrass, bluejoint panicum, sloughgrass, and low panicums. Periodic high water levels provide a natural deferment from excessive grazing. Carpetgrass, an introduced plant, tends to dominate the drier parts of this site under excessive grazing conditions.

This soil is not suited to urban development.

This Gator soil is in capability subclass VIIw.

20—Immokalee fine sand. This soil is deep, nearly level, and poorly drained. It is on flatwoods. Slope is 0 to 2 percent.

Typically, this Immokalee soil has a dark gray fine sand surface layer about 5 inches thick. The subsurface layer to a depth of about 43 inches is white fine sand. The subsoil to a depth of about 65 inches is fine sand that is black in the upper part and dark brown in the middle and lower parts. Black, firm ortstein fragments are in the middle part of the subsoil. The substratum to a depth of about 80 inches is brown fine sand.

Included with this soil in mapping are small areas of Myakka, Smyrna, Punta, and Farmton soils. Myakka and Smyrna soils are in lower positions on the landscape and have a shallower subsoil than the Immokalee soil. Punta and Farmton soils are in positions on the landscape similar to those of the Immokalee soil. Punta soils have a deeper subsoil, and Farmton soils have a loamy subsoil. The included soils make up about 15 percent of the map unit.

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

This soil is well suited to pasture. Excessive water on the surface can be removed by shallow ditches. Fertilizer and lime are needed for optimum growth of grasses and legumes. Suitable pasture plants are pangolagrass, improved bahiagrass, and white clover. Grazing management, brush control, protection from wildfire, and proper location of stockwater and fences are needed.

Typically, this soil is characterized by the South Florida Flatwoods range site. This site can be identified by scattered pine trees and an understory of saw palmetto and grasses. If this range site is properly managed, using such practices as deferred grazing and brush control, it has the potential to produce significant amounts of creeping bluestem, lopsided indiangrass, chalky bluestem, and various panicums. As range deterioration occurs because of poor grazing management, this site is dominated by saw palmetto and pineland threeawn (wiregrass).

In its natural condition, this Immokalee soil is poorly suited to cultivated crops because of wetness and poor soil quality. Only a limited number of crops can be grown unless very intensive management practices are used; however, this soil can be made suitable for several vegetable crops. A water control system is needed to remove excess water in wet seasons and to provide water for subsurface irrigation in dry seasons. A flow-through irrigation system works well on this soil. The organic matter content can be maintained by using all crop residue, planting cover crops, and using a suitable cropping system. Crops respond to lime and fertilizer. Cucumbers, bell peppers, squash, and watermelons are the main crops grown.

In its natural condition, this soil is poorly suited to citrus. It can be made suitable by installing a water control system that maintains the water table at an effective depth. Trees should be planted on beds to increase the effective depth to the water table, and a plant cover needs to be maintained between the trees. Fertilizer and lime are needed on a regular basis.

This soil has moderate potential productivity for slash pine. Equipment limitations, seedling mortality, and plant competition are major concerns in management. Bedding of rows helps in establishing seedlings by increasing the depth to the water table.

In its natural condition, this soil is poorly suited to urban development. Drainage is needed to overcome wetness, and fill material is needed for most urban uses. Preserving the existing plant cover during construction helps to control erosion.

This Immokalee soil is in capability subclass IVw.

21—Malabar fine sand. This soil is deep, nearly level, and poorly drained. It is in sloughs and low-lying hammocks. Slope is 0 to 1 percent.

Typically, this Malabar soil has a gray fine sand surface layer about 6 inches thick. The subsurface layer to a depth of about 12 inches is yellowish brown fine sand. The subsoil to a depth of about 50 inches is fine sand that is light yellowish brown in the upper part, yellowish brown in the middle part, and light olive brown in the lower part. To a depth of about 80 inches, it is gray fine sandy loam.

Included with this soil in mapping are small areas of Delray, Felda, Pineda, and Valkaria soils. Delray soils are in depressions and have a thick, dark surface layer. Felda, Pineda, and Valkaria soils are in landscape positions similar to those of the Malabar soil. Felda soils do not have a brightly colored subsoil. Pineda soils have tonguing of the sandy subsurface layer into the loamy subsoil. Valkaria soils are sandy throughout. In places are small areas of soils similar to the Malabar soil except they do not have a brightly colored subsoil. The included soils make up about 15 percent of the map unit.

This Malabar soil has a high water table within a depth of 12 inches for 2 to 4 months during most years. The available water capacity is low. The permeability is slow or very slow. In sloughs, the soil surface can be covered by shallow, slowly moving water for 1 to 7 days or more during periods of heavy rainfall.

This soil is well suited to pasture. Excessive water on the surface can be removed by shallow ditches. Fertilizer and lime are needed for optimum growth of grasses and legumes. Suitable pasture plants are pangolagrass, improved bahiagrass, and white clover. Grazing management, brush control, protection from wildlife, and proper location of stockwater, walkways, and fences are needed.

Typically, this soil is characterized by the Slough range site. This site can be identified by an open expanse of grasses, sedges, and rushes in an area where the soil is saturated during the rainy season. If this range site is properly managed, using such practices as deferred grazing, the potential for forage production is almost as high as that of the Freshwater Marshes and Ponds range site. Desirable forage plants include blue maidencane, maidencane, chalky bluestem, toothachegrass, and South Florida bluestem. Carpetgrass, an introduced plant, tends to dominate this site under excessive grazing conditions.

In its natural condition, this Malabar soil is poorly suited to cultivated crops because of wetness and poor soil quality. Only a limited number of crops can be grown unless very intensive management practices are used; however, this soil can be made suitable for several vegetable crops. A water control system is needed to remove excess water in wet seasons and to provide water for subsurface irrigation in dry seasons. A flow-through irrigation system works well on this soil. The organic matter content can be maintained by using all crop residue, planting cover crops, and using a suitable cropping system. Crops respond well to lime and fertilizer. Cucumbers and watermelons are the main crops grown.

In its natural condition, this soil is poorly suited to citrus. It can be made suitable by installing a water control system that maintains the water table at an effective depth. Trees should be planted on beds to increase the effective depth to the water table, and a plant cover needs to be maintained between the trees. Fertilizer and lime are needed on a regular basis.

This soil has moderate potential productivity for slash pine. Potential productivity is attainable only in areas that have adequate surface drainage. Equipment limitations, seedling mortality, and plant competition are major concerns in management. Bedding of rows helps in establishing seedlings by increasing the depth to the water table.

This soil is poorly suited to urban development because of wetness. Drainage is needed to overcome wetness, and fill material is needed for most urban uses. Preserving the existing plant cover during construction helps to control erosion.

This Malabar soil is in capability subclass IVw.

22—Malabar fine sand, high. This soil is deep, nearly level, and poorly drained. It is on flatwoods and hammocks. Slope is 0 to 2 percent.

Typically, this Malabar soil has a dark gray fine sand surface layer about 5 inches thick. The subsurface layer to a depth of about 13 inches is fine sand that is pale brown in the upper part and yellowish brown in the lower part. The subsoil to a depth of about 40 inches is brownish yellow fine sand. The next layer to a depth of about 52 inches is pale brown fine sand. The lower part of the subsoil extends to a depth of at least 80 inches. It is gray fine sandy loam in the upper part and gray sandy clay loam in the lower part.

Included with this soil in mapping are small areas of EauGallie, Farmton, and Pineda soils. EauGallie and Farmton soils are on flatwoods and have a dark colored subsoil. Pineda soils have a sandy subsurface layer that tongues into a loamy subsoil. In places are small areas of soils similar to the Malabar soil; some do not have the brightly colored subsoil and others have a secondary accumulation of carbonates in the subsoil. The included soils make up about 15 percent of the map unit.

This Malabar soil has a high water table within a depth of 12 inches for 1 to 4 months during most years. The available water capacity is low. The permeability is slow or very slow.

This soil is well suited to pasture. Excessive water on the surface can be removed by shallow ditches. Fertilizer and lime are needed for optimum growth of grasses and legumes. Suitable pasture plants are pangolagrass, improved bahiagrass, and white clover. Grazing management, brush control, protection from wildfire, and proper location of stockwater and fences are needed.

Typically, this soil is characterized by the South Florida Flatwoods range site. This site can be identified by scattered pine trees and an understory of saw palmetto and grasses. If this range site is properly managed, using such practices as deferred grazing and brush control, it has the potential to produce significant amounts of creeping bluestem, lopsided indiangrass, chalky bluestem, and various panicums. As range deterioration occurs because of poor grazing management, this site is dominated by saw palmetto and pineland threeawn (wiregrass).

In its natural condition, this Malabar soil is poorly suited to cultivated crops because of wetness and poor soil quality. Only a limited number of crops can be grown unless very intensive management practices are used; however, this soil can be made suitable for several vegetable crops. A water control system is needed to remove excess water in wet seasons and to provide water for subsurface irrigation in dry seasons. A flow-through irrigation system works well on this soil. The organic matter content can be maintained by using all crop residue, planting cover crops, and using a suitable cropping system. Crops respond well to lime and fertilizer. Cucumbers and watermelons are the main crops grown.

In its natural condition, this soil is poorly suited to citrus. It can be made suitable by installing a water control system that maintains the water table at an effective depth. Trees should be planted on beds to increase the effective depth to the water table, and a plant cover needs to be maintained between the trees. Fertilizer and lime are needed on a regular basis.

This soil has moderate potential productivity for slash pine. Equipment limitations, seedling mortality, and plant competition are major concerns in management. Bedding of rows helps in establishing seedlings by increasing the depth to the water table.

In its natural condition, this soil is poorly suited to urban development. Drainage is needed to overcome wetness, and fill material is needed for most urban uses. Preserving the existing plant cover during construction helps to control erosion.

This Malabar soil is in capability subclass IIIw.

23—Malabar fine sand, depressional. This soil is deep, nearly level, and very poorly drained. It is in depressions. Slope is 0 to 1 percent.

Typically, this Malabar soil has a very dark gray fine sand surface layer about 2 inches thick. The subsurface layer to a depth of about 25 inches is light gray fine sand. The subsoil is yellowish brown fine sand in the upper part. The lower part to a depth of about 80 inches is grayish brown sandy clay loam.

Included with this soil in mapping are small areas of Delray, Felda, and Pineda soils. Delray soils are in the lowest positions. Felda and Pineda soils are in positions similar to those of the Malabar soil. Delray soils have a thick, dark surface layer. Felda soils do not have a brightly colored subsoil, and Pineda soils have tonguing of the sandy subsurface layer into the loamy subsoil. Pineda and Felda soils have a loamy subsoil at a shallower depth than that of the Malabar soil. In places are small areas of soils similar to the Malabar soil; some do not have the brightly colored subsoil and others do not have a loamy subsoil. The included soils make up about 15 percent of the map unit.

This Malabar soil has a high water table that usually covers the surface for 6 months or more. The available water capacity is low. The permeability is slow or very slow.

In its natural condition, this soil is not suited to cultivated crops, citrus, or improved pasture. The high water table severely restricts plant growth. Establishing an adequate water control system is difficult because suitable outlets are not available in most locations; however, if a system can be installed, this soil can be made suitable for improved pasture grasses that tolerate wetness.

Typically, this soil is characterized by the Freshwater Marshes and Ponds range site. This site can be identified by 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 2 months or more during the year. If this range site is properly managed, the potential for forage production is higher than that of any other range site. Chalky bluestem and blue maidencane dominate the drier parts of the Freshwater Marshes and Ponds range site, and maidencane is dominant in the wetter parts. Other desirable forage plants include cutgrass, bluejoint panicum, sloughgrass, and low panicums. Periodic high water levels provide a natural deferment from excessive grazing. Carpetgrass, an introduced plant, tends to dominate the drier parts of this site under excessive grazing conditions.

This soil is not suited to commercial pine tree production because of ponding. Outlets generally are not available, and drainage is not practical. Baldcypress has been planted in a few areas of this soil.

This soil is not suited to urban development.

This Malabar soil is in capability subclass VIIw.

24—Myakka fine sand. This soil is deep, nearly level, and poorly drained. It is on flatwoods. Slope is 0 to 2 percent.

Typically, this Myakka soil has a dark gray fine sand surface layer about 6 inches thick. The subsurface layer to a depth of about 22 inches is light gray fine sand. The subsoil to a depth of about 32 inches is fine sand that is very dark brown in the upper part and dark brown in the lower part. The substratum to a depth of about 80 inches is fine sand that is pale brown in the upper part, light gray in the middle part, and grayish brown in the lower part.

Included with this soil in mapping are small areas of Smyrna, Basinger, Immokalee, and EauGallie soils. Smyrna and Basinger soils are in slightly lower positions on the landscape than the Myakka soil. Smyrna soils have a shallower subsoil, and Basinger soils have a slightly darkened sandy subsoil. Immokalee soils are in slightly higher positions on the landscape and have a deeper subsoil. EauGallie soils are in positions on the landscape similar to those of the Myakka soil and have a loamy subsoil more than 40 inches below the surface. The included soils make up about 15 percent of the map unit.

This Myakka soil has a high water table within a depth of 12 inches for 1 to 4 months during most years. The available water capacity is low. The permeability is moderate or moderately rapid.

This soil is well suited to pasture. Excessive water on the surface can be removed by shallow ditches. Suitable pasture plants are pangolagrass, improved bahiagrass, and white clover.

Typically, this soil is characterized by the South Florida Flatwoods range site. This site can be identified by scattered pine trees and an understory of saw palmetto and grasses. If this range site is properly managed, using such practices as deferred grazing and brush control, it has the potential to produce significant amounts of creeping bluestem, lopsided indiangrass, chalky bluestem, and various panicums. As range deterioration occurs because of poor grazing management, this site is dominated by saw palmetto and pineland threeawn (wiregrass).

In its natural condition, this soil is poorly suited to cultivated crops because of wetness and poor soil quality. Only a limited number of crops can be grown unless very intensive management practices are used;

however, this soil can be made suitable for several vegetable crops. A water control system is needed to remove excess water in wet seasons and to provide water for subsurface irrigation in dry seasons. A flow-through irrigation system works well on this soil. Crops respond well to lime and fertilizer.

In its natural condition, this soil is poorly suited to citrus. It can be made suitable by installing a water control system that maintains the water table at an effective depth. Trees should be planted on beds to increase the effective depth to the water table, and a plant cover needs to be maintained between the trees. Fertilizer and lime are needed on a regular basis.

This soil has moderate potential productivity for slash pine. Equipment limitations, seedling mortality, and plant competition are major concerns in management. Bedding of rows helps in establishing seedlings by increasing the depth to the water table.

In its natural condition, this soil is poorly suited to urban development. Drainage is needed to overcome wetness, and fill material is needed for most urban uses.

This Myakka soil is in capability subclass IVw.

25—Ona fine sand. This soil is deep, nearly level, and poorly drained. It is on flatwoods. Slope is 0 to 2 percent.

Typically, this Ona soil has a black fine sand surface layer about 5 inches thick. The subsoil to a depth of about 31 inches is fine sand that is very dark brown in the upper part and dark grayish brown in the lower part. The next layer to a depth of 46 inches is pale brown fine sand. To a depth of about 80 inches, the soil is black fine sand.

Included with this soil in mapping are small areas of Basinger, EauGallie, and Smyrna soils. Basinger soils are in lower positions on the landscape than the Ona soil and have a slightly darkened subsoil. EauGallie soils are in positions on the landscape similar to those of the Ona soil and have a loamy subsoil at a depth of more than 40 inches. Smyrna soils have a deeper subsoil than that of the Ona soil. The included soils make up about 15 percent of the map unit.

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

This soil is well suited to pasture. Excessive water on the surface can be removed by shallow ditches. Fertilizer and lime are needed for optimum growth of grasses and legumes. Suitable pasture plants are pangolagrass, improved bahiagrass, and white clover. Grazing management, brush control, protection from wildfire, and proper location of stockwater and fences are needed.

Typically, this soil is characterized by the South Florida Flatwoods range site. This site can be identified by scattered pine trees and an understory of saw palmetto and grasses. If this range site is properly managed, using such practices as deferred grazing and brush control, it has the potential to produce significant amounts of creeping bluestem, lopsided indiangrass, chalky bluestem, and various panicums. As range deterioration occurs because of poor grazing management, this site is dominated by saw palmetto and pineland threeawn (wiregrass).

In its natural condition, this soil is poorly suited to cultivated crops because of wetness and poor soil quality. Only a limited number of crops can be grown unless very intensive management practices are used; however, this soil can be made suitable for several vegetable crops. A water control system is needed to remove excess water in wet seasons and to provide water for subsurface irrigation in dry seasons. A flow-through irrigation system works well on this soil. The organic matter content can be maintained by using all crop residue, plowing under cover crops, and using a suitable cropping system. Crops respond well to lime and fertilizer. Cucumbers and watermelons are the main crops grown.

In its natural condition, this Ona soil is poorly suited to citrus. It can be made suitable by installing a water control system that maintains the water table at an effective depth. Trees should be planted on beds to increase the effective depth to the water table, and a plant cover needs to be maintained between the trees. Fertilizer and lime are needed on a regular basis.

This soil has moderate potential productivity for slash pine. Equipment limitations, seedling mortality, and plant competition are major concerns in management. Bedding of rows helps in establishing seedlings by increasing the depth to the water table.

In its natural condition, this soil is poorly suited to urban development. Drainage is needed to overcome wetness, and fill material is needed for most urban uses. Preserving the existing plant cover during construction helps to control erosion.

This Ona soil is in capability subclass IIIw.

26—Pineda fine sand. This soil is deep, nearly level, and poorly drained. It is in sloughs. Slope is 0 to 1 percent.

Typically, this Pineda soil has a black fine sand surface layer about 3 inches thick. The subsurface layer to a depth of about 15 inches is fine sand that is light brownish gray in the upper part and pale brown in the lower part. The subsoil extends to a depth of about 41 inches. It is yellowish brown fine sand in the upper part, yellow fine sand in the middle part, and gray fine sandy loam in the lower part. The substratum to a depth of 80 inches is gray loamy sand and light gray fine sand.

Included with this soil in mapping are small areas of Felda, Malabar, and Valkaria soils. These soils are in positions on the landscape similar to those of the Pineda soil. Felda soils do not have a brightly colored subsoil. Malabar soils have a deeper, loamy subsoil. Valkaria soils do not have a loamy subsoil. Small areas of Pineda soils are in slightly higher positions on the landscape. The included soils make up about 10 percent of the map unit.

This Pineda soil has a high water table within a depth of 12 inches for 2 to 4 months during most years. The available water capacity is low. The permeability is slow or very slow during periods of high rainfall. This soil is covered by slowly moving, shallow water for 1 to 7 days or more.

This soil is well suited to pasture. Excessive water on the surface can be removed by shallow ditches. Fertilizer and lime are needed for optimum growth of grasses and legumes. Suitable pasture plants are pangolagrass, improved bahiagrass, and white clover. Grazing management, brush control, protection from wildfire, and proper location of stockwater and fences are needed.

Typically, this soil is characterized by the Slough range site. This site can be identified by an open expanse of grasses, sedges, and rushes in an area where the soil is saturated during the rainy season. If this range site is properly managed, using such practices as deferred grazing, the potential for forage production is almost as high as that of the Freshwater Marshes and Ponds range site. Desirable forage plants include blue maidencane, maidencane, chalky bluestem, toothachegrass, and South Florida bluestem. Carpetgrass, an introduced plant, tends to dominate this site under excessive grazing conditions.

In its natural condition, this Pineda soil is poorly suited to cultivated crops because of wetness and poor soil quality. Only a limited number of crops can be grown unless very intensive management practices are used; however, this soil can be made suitable for several vegetable crops. A water control system is needed to remove excess water in wet seasons and to provide water for subsurface irrigation in dry seasons. A flow-through irrigation system works well on this soil. The organic matter content can be maintained by using all crop residue, planting cover crops, and using a suitable cropping system. Crops respond well to lime and fertilizer. Cucumbers, bell peppers, squash, and watermelons are the main crops grown.

In its natural condition, this soil is poorly suited to citrus. It can be made suitable by installing a water control system that maintains the water table at an effective depth. Trees should be planted on beds to increase the effective depth to the water table, and a plant cover needs to be maintained between the trees. Fertilizer and lime are needed on a regular basis.

This soil has moderately high potential productivity for slash pine. Equipment limitations, seedling mortality, and plant competition are major concerns in management. Bedding of rows helps in establishing seedlings by increasing the depth to the water table.

In its natural condition, this soil is poorly suited to urban development. Drainage is needed to overcome wetness, and fill material is needed for most urban uses. Preserving the existing plant cover during construction helps to control erosion.

This Pineda soil is in capability subclass IIIw.

27—Pineda fine sand, frequently flooded. This soil is deep, nearly level, and poorly drained. It is adjacent to streams and well defined drainageways. Slope is 0 to 2 percent.

Typically, this Pineda soil has a very dark gray fine sand surface layer about 3 inches thick. The subsurface layer to a depth of about 16 inches is grayish brown fine sand. The subsoil extends to a depth of about 37 inches. It is brownish yellow fine sand in the upper part, and the lower part is light gray fine sandy loam that has pockets of light gray fine sand. The substratum to a depth of about 80 inches is fine sand. It is light brownish gray in the upper part, light gray in the middle part, and light brownish gray in the lower part.

Included with this soil in mapping are small areas of Basinger, Felda, and Pompano soils. These soils are in landscape positions similar to those of the Pineda soil. Basinger soils have a slightly darkened subsoil and are sandy throughout. Felda soils do not have a brightly colored subsoil or sandy intrusions in the loamy subsoil. Pompano soils do not have a subsoil and are sandy throughout. The included soils make up about 15 percent of the map unit.

This Pineda soil has a high water table within a depth of 12 inches for 2 to 4 months during most years. Flooding occurs in most years. The available water capacity is low. The permeability is slow or very slow.

In its natural condition, this soil is not suited to pasture, cultivated crops, or citrus because of the hazard of flooding. This soil is moderately suited to pasture grasses if excess water is removed. A water control system is needed to remove excess surface water after heavy rains, and flooding should be controlled. Suitable pasture plants are pangolagrass, improved bahiagrass, and white clover. Fertilizer and lime are needed for optimum growth of grasses and legumes. Proper stocking, pasture rotation, and timely deferment of grazing help keep the pasture in good condition.

This soil is characterized by the Slough range site. This site can be identified by an open expanse of grasses, sedges, and rushes in an area where the soil is saturated during the rainy season. If this range site is properly managed, using such practices as deferred grazing, the potential for forage production is almost as high as that of the Freshwater Marshes and Ponds range site. Desirable forage plants include blue maidencane, maidencane, chalky bluestem, toothachegrass, and South Florida bluestem. Carpetgrass, an introduced plant, tends to dominate this site under excessive grazing conditions.

This soil has moderately high potential productivity for slash pine. Equipment limitations, seedling mortality, and plant competition are major concerns in management. Bedding of rows helps in establishing seedlings by increasing the depth to the water table.

This soil is not suited to urban development.

This Pineda soil is in capability subclass Vw.

28—Pineda fine sand, depressional. This soil is deep, nearly level, and very poorly drained. It is in depressions. Slope is 0 to 1 percent.

Typically, this Pineda soil has a very dark gray fine sand surface layer about 7 inches thick. The subsurface layer to a depth of about 15 inches is light grayish brown fine sand. The subsoil to a depth of 24 inches is brownish yellow fine sand. The next layer to a depth of 38 inches is light yellowish brown fine sand. The lower part of the subsoil to a depth of about 66 inches is fine sandy loam that is grayish brown in the upper part and gray in the lower part. The next layer to a depth of about 80 inches is light gray fine sandy loam.

Included with this soil in mapping are small areas of Felda, Floridana, and Malabar soils. These soils are in depressions. Felda soils do not have a brightly colored subsoil. Floridana soils have a thick, dark colored surface layer. Malabar soils have a loamy subsoil that is more than 40 inches below the surface. The included soils make up about 15 percent of the map unit.

This Pineda soil has a water table that usually covers the surface for 6 months or more. The available water capacity is low. The permeability is slow or very slow.

In its natural condition, this soil is not suited to cultivated crops, pasture, or citrus. The high water table severely restricts plant growth. Establishing an adequate water control system is difficult because suitable outlets are not available in most locations; however, if a system can be installed, this soil can be made suitable for improved pasture grasses that tolerate wetness.

Typically, this soil is characterized by the Freshwater Marshes and Ponds range site. This site can be identified by 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 2 months or more during the year. If this range site is properly managed, using such practices as proper stocking, the potential for forage production is higher than that of any other range site. Chalky bluestem and blue maidencane dominate the drier parts of the Freshwater Marshes and Ponds range site, and maidencane is dominant in the wetter parts. Other desirable forage plants include cutgrass, bluejoint panicum, sloughgrass, and low panicums. Periodic high water levels provide a natural deferment from excessive grazing. Carpetgrass, an introduced plant, tends to dominate the drier parts of this site under excessive grazing conditions.

This soil is not suited to commercial pine tree production because of ponding; however, baldcypress has been planted in a few areas.

This soil is not suited to urban development.

This Pineda soil is in capability subclass VIIw.

29—Pineda-Pinellas fine sands. These soils are nearly level and poorly drained. They are mostly on hammocks and in sloughs. Pineda and Pinellas soils are too intricately mixed to be mapped separately at the selected scale. Slope is 0 to 1 percent. The Pineda soil makes up about 45 percent of the complex, the Pinellas soil makes up about 35 percent, and similar soils make up about 20 percent.

Typically, this Pineda soil has a gray fine sand surface layer about 5 inches thick. The subsurface layer to a depth of about 16 inches is pale brown fine sand. The subsoil to a depth of about 24 inches is brownish yellow fine sand. It is gray sandy clay loam to a depth of about 50 inches and gray fine sandy loam to a depth of about 70 inches. The substratum is grayish brown fine sand to a depth of about 80 inches or more.

This Pineda soil has a high water table within a depth of 12 inches for 1 to 4 months during most years. The available water capacity is low. The permeability is slow or very slow.

Typically, this Pinellas soil has a dark gray fine sand surface layer about 4 inches thick. The subsurface layer to a depth of about 20 inches is fine sand that is light brownish gray in the upper part and grayish brown in the lower part. The subsoil to a depth of about 42 inches is light gray fine sand in the upper part and light gray fine sandy loam in the lower part. The substratum to a depth of about 80 inches is fine sand that is very pale brown in the upper part and light greenish gray in the lower part.

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

Included with these soils in mapping are small areas of EauGallie, Farmton, and Wabasso soils. These soils are in landscape positions similar to those of the Pineda and Pinellas soils. EauGallie soils have a dark colored subsoil within 20 inches of the surface, and Farmton soils have a dark colored subsoil within 30 inches of the surface. Wabasso soils do not have a brightly colored subsoil layer or calcareous material.

The Pineda and Pinellas soils are well suited to pasture. Fertilizer and lime are needed for optimum growth of grasses and legumes. Suitable pasture plants are pangolagrass, improved bahiagrass, and white clover.

Typically, these soils are characterized by the Slough range site. This site can be identified by an open expanse of grasses, sedges, and rushes in an area where the soil is saturated during the rainy season. If this range site is properly managed, using such practices as deferred grazing, the potential for forage production is almost as high as that of the Freshwater Marshes and Ponds range site. Desirable forage plants include blue maidencane, maidencane, chalky bluestem, toothachegrass, and South Florida bluestem. Carpetgrass, an introduced plant, tends to dominate this site under excessive grazing conditions.

In their natural condition, these soils are poorly suited to cultivated crops because of wetness and poor soil quality. Only a limited number of crops can be grown on the soils unless very intensive management practices are used; however, these soils can be made suitable for several vegetable crops. A water control system is needed to remove excess water in wet seasons and to provide water for subsurface irrigation in dry seasons. A flow-through irrigation system works well on these soils. The organic matter content can be maintained by using all crop residue, planting cover crops, and using a suitable cropping system. Crops respond to lime and fertilizer.

In their natural condition, the Pineda and Pinellas soils are poorly suited to citrus. They can be made suitable by installing a water control system that maintains the water table at an effective depth. Trees should be planted on beds to increase the effective depth to the water table, and a plant cover needs to be maintained between the trees. Fertilizer and lime are needed on a regular basis.

The Pineda soil has moderately high potential productivity for slash pine, and the Pinellas soil has moderate potential productivity. Equipment limitations, seedling mortality, and plant competition are concerns in management. Bedding of rows helps in establishing seedlings by increasing the depth to the water table.

In their natural condition, these soils are poorly suited to urban development. Drainage is needed to overcome wetness, and fill material is needed for most urban uses. Preserving the existing plant cover during construction helps to control erosion.

The Pineda and Pinellas soils are in capability subclass IIIw.

30—Pomello fine sand. This soil is deep, nearly level, and moderately well drained. It is on low ridges on flatwoods. Slope is 0 to 2 percent.

Typically, this Pomello soil has a gray fine sand surface layer about 6 inches thick. The subsurface layer to a depth of about 46 inches is white fine sand. The subsoil to a depth of about 66 inches is fine sand. It is black in the upper part, dark reddish brown and dark brown in the middle part, and dark yellowish brown in lower part. The substratum to a depth of about 80 inches is light yellowish brown fine sand.

Included with this soil in mapping are small areas of Punta and Immokalee soils. Punta soils are lower on the landscape and have a deeper subsoil than the Pomello soil. Immokalee soils are still lower on the landscape and have a higher water table. In places are some soils that have a dark subsoil that is more than 50 inches below the surface. The included soils make up about 10 percent of the map unit.

This Pomello soil has a high water table at a depth of 24 to 42 inches for 1 to 4 months during most years. The available water capacity is very low. The permeability is moderately rapid.

This soil is only moderately suited to pasture because of droughtiness and low fertility. Drought-tolerant species are suitable for planting. This soil is better suited to bahiagrass than to any other grass.

Fertilizer and lime are needed for optimum growth of grasses and legumes. Grazing management, brush control, protection from wildfire, and proper location of stockwater and fences are needed.

Typically, this soil is characterized by the Sand Pine Scrub range site. This site can be identified by a fairly dense stand of sand pine trees and a dense understory of oaks, saw palmetto, and other shrubs. Because of past timber management practices, sand pines are not in all areas of this range site. The droughty nature of this soil limits the potential for producing native forage. If this range site is properly managed, using such practices as deferred grazing and brush control, it has the potential to produce limited amounts of lopsided indiangrass, creeping bluestem, and beaked panicum. Livestock generally do not use this range site if more productive sites are available. Summer shade, winter protection, and dry bedding during the wet seasons are provided on this range site.

In its natural condition, this Pomello soil is not suited to cultivated crops because of droughtiness and poor soil quality; however, it can be made suitable by supplying sufficient water with a well designed irrigation system and by adding sufficient nutrients for plant growth. Crop residue left on or near the surface helps to conserve moisture, maintain tilth, and control erosion. Crops respond well to lime and fertilizer.

In its natural condition, this soil is poorly suited to citrus because of the very low available water capacity and poor soil quality. It can be made suitable if sufficient water is supplied with a well designed irrigation system. Micro-jet irrigation systems work well on this soil.

This soil has moderate potential productivity for longleaf pine. Seedling mortality, plant competition, and equipment limitations are major concerns in management.

This soil is well suited to urban development. Preserving the existing plant cover during construction helps to control erosion.

This Pomello soil is in capability subclass VIs.

31—Pompano fine sand. This soil is deep, nearly level, and poorly drained. It is in sloughs and poorly defined drainageways. Slope is 0 to 1 percent.

Typically, this Pompano soil has a very dark gray fine sand surface layer about 5 inches thick. The underlying material to a depth of 80 inches is fine sand. It is gray to a depth of 12 inches, light brownish gray to a depth of 29 inches, grayish brown to a depth of 61 inches, and white below that depth.

Included with this soil in mapping are small areas of Basinger, Valkaria, and Anclote soils. Basinger and Valkaria soils are in landscape positions similar to those of the Pompano soil. Basinger soils have a slightly darkened subsoil, and Valkaria soils have a brightly colored layer in the subsoil. Anclote soils are in depressions and have a thick, dark surface layer. The included soils make up about 15 percent of the map unit.

This Pompano soil has a high water table within a depth of 12 inches for 2 to 4 months during most years. The available water capacity is very low. The permeability is rapid. The soil surface can be covered by shallow, slowly moving water for 1 to 7 days or more during periods of heavy rain.

This soil is well suited to pasture. Excessive water on the surface can be removed by shallow ditches. Fertilizer and lime are needed for optimum growth of grasses and legumes. Suitable pasture plants are pangolagrass, improved bahiagrass, and white clover. Grazing management, brush control, protection from wildfire, and proper location of stockwater and fences are needed.

Typically, this soil is characterized by the Slough range site. This site can be identified by an open expanse of grasses, sedges, and rushes in an area where the soil is saturated during the rainy season (fig. 8). If this range site is properly managed, using such practices as deferred grazing, the potential for forage production is almost as high as that of the Freshwater Marshes and Ponds range site. Desirable forage plants include blue maidencane, maidencane, chalky bluestem, toothachegrass, and South Florida bluestem. Carpetgrass, an introduced plant, tends to dominate this site under excessive grazing conditions.

In its natural condition, this Pompano soil is poorly suited to cultivated crops because of wetness and poor soil quality. Only a limited number of crops can be grown unless very intensive management practices are used; however, this soil can be made suitable for several vegetable crops. A water control system is needed to remove excess water in wet seasons and to provide water for subsurface irrigation in dry seasons. A flow-through irrigation system works well on this soil. The organic matter content can be maintained by using all crop residue, planting cover crops, and using a suitable cropping system. Crops respond well to lime and fertilizer. Cucumbers and watermelons are the main crops grown.

In its natural condition, this soil is poorly suited to citrus. It can be made suitable by installing a water control system that maintains the water table at an effective depth. Trees should be planted on beds to

Figure 8.—The native range on Pompano fine sand is an open expanse of grasses, sedges, and rushes.

increase the effective depth to the water table, and a plant cover needs to be maintained between the trees. Fertilizer and lime are needed on a regular basis.

This soil has moderate potential productivity for slash pine. Potential productivity is attainable only in areas of this soil that are adequately drained. Equipment limitations, seedling mortality, and plant competition are major concerns in management. Bedding of rows helps in establishing seedlings by increasing the depth to the water table.

This soil is poorly suited to urban development because of wetness. Drainage is needed to overcome wetness, and fill material is needed for most urban uses. Preserving the existing plant cover during construction helps to control erosion.

This Pompano soil is in capability subclass IVw.

32—Punta fine sand. This soil is deep, nearly level, and poorly drained. It is on flatwoods. Slope is 0 to 2 percent.

Typically, this Punta soil has a gray fine sand surface layer about 3 inches thick. The subsurface layer to a depth of about 60 inches is fine sand that is light gray in the upper part and white in the lower part. The subsoil to a depth of about 80 inches is fine sand. It is black in the upper part and is very dark brown in the lower part.

Included with this soil in mapping are small areas of Immokalee and Satellite soils. Immokalee soils are in positions on the landscape similar to those of the Punta soil and have a shallower subsoil. Satellite soils are better drained and do not have a subsoil. The included soils make up about 15 percent of the map unit.

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

This soil is well suited to pasture. Excessive water on the surface can be removed by shallow ditches. Fertilizer and lime are needed for optimum growth of grasses and legumes. Suitable pasture plants are improved bahiagrass, hairy indigo, and bermudagrass. Grazing management, brush control, protection from wildfire, and proper location of stockwater and fences are needed.

Typically, this soil is characterized by the South Florida Flatwoods range site. This site can be identified by scattered pine trees and an understory of saw palmetto and grasses. If this range site is properly managed, using such practices as deferred grazing and brush control, it has the potential to produce significant amounts of creeping bluestem, lopsided indiangrass, chalky bluestem, and various panicums. As range deterioration occurs because of poor grazing management, this site is dominated by saw palmetto and pineland threeawn (wiregrass).

This Punta soil is poorly suited to cultivated crops because of wetness, low fertility, and high acidity. Good results from growing a limited number of suitable crops can be obtained if very intensive management practices are used. Adequate water-control and soil-improving measures can make this soil more suitable for several vegetable crops. Cucumbers, bell peppers, watermelons, and squash are the main crops grown. Crops respond well to lime and fertilizer.

In its natural condition, this Punta soil is poorly suited to citrus because of wetness and low fertility. It can be made suitable by installing a water control system that maintains good drainage. Planting trees on beds helps to provide good surface drainage. A good cover of close-growing vegetation is needed between the young trees to protect the soil from blowing. Regular applications of fertilizer and occasional applicatons of lime are needed. A micro-jet irrigation system works well on this soil.

This soil has moderate potential productivity for slash pine; however, adequate water control is needed before the potential can be attained. Equipment limitations, seedling mortality, and plant competition are the main concerns in management. Bedding of rows helps in establishing seedlings by increasing the depth to the water table.

In its natural condition, this soil is poorly suited to urban development. Drainage is needed to overcome wetness, and fill material is needed for most urban uses. Preserving the existing plant cover during construction helps to control erosion.

This Punta soil is in capability subclass IVw.

33—Quartzipsamments, nearly level. These soils are deep and consist of sandy material that has been dredged and pumped over natural soils. The former areas were flatwoods, sloughs, and depressions. Slope ranges from 0 to 3 percent. The primary area of Quartzipsamments in DeSoto County is 30 to 50 feet of pumped-in sandy material.

The color and thickness of this material vary from one area to another. One of the more common profiles has a light gray or white fine sand surface layer about 18 inches thick. The next layer to a depth of about 38 inches is light gray fine sand mixed with large pockets of brown fine sand. A layer of light brownish gray fine sand extends to a depth of about 72 inches. The underlying material to a depth of about 80 inches is brown fine sand.

Included with these soils in mapping are soils similar to the Quartzipsamments; some have less than 20 inches of fill material and others differ only by having fragments of dark, weakly cemented material or small amounts of such soil material as sandy loam or sandy clay loam. The included soils make up about 20 percent of the map unit.

Quartzipsamments have a water table that is dominantly below a depth of 72 inches but ranges from a depth of 20 to more than 80 inches. The available water capacity is variable but is generally very low throughout the soils. The permeability is primarily very rapid but ranges from very rapid to moderate.

These soils are not suited to pasture, cultivated crops, commercial tree production, or citrus because of their extremely droughty nature.

These soils are well suited to urban development.

These Quartzipsamments have not been assigned to a capability subclass or a range site.

34—Samsula muck, depressional. This soil is deep, nearly level, and very poorly drained. It is in marshes, swamps, and depressional areas. Slope is 0 to 1 percent.

Typically, this Samsula soil has a muck surface layer about 19 inches thick. It is black in the upper part and dark reddish brown in the lower part. The underlying material is black fine sand in the upper part. The lower part to a depth of about 80 inches is light gray sand.

Included with this soil in mapping are small areas of Anclote and Terra Ceia soils. Anclote soils are mineral soils that have a thick, dark colored surface layer. They are in slightly higher positions generally near the outer edges of delineations. Terra Ceia soils have muck more than 51 inches thick. The included soils make up about 15 percent of the map unit.

This Samsula soil has a high water table that usually covers the surface for 6 months or more. The available water capacity is moderate. The permeability is rapid. If this soil is drained, the organic material initially shrinks on drying to about half the original thickness and then subsides further as a result of compaction and oxidation. These losses are most rapid during the first 2 years this soil is drained. If drainage continues, this soil continues to subside at the rate of about 1 inch per year. The lower the water table, the more rapid the loss.

In its natural condition, this soil is not suited to improved pasture, cultivated crops, citrus, or pine tree production. Baldcypress has been planted in a few areas of this soil.

If water is properly controlled, this soil can be made suitable for improved pasture. A water control system should maintain the water table near the surface to prevent excessive oxidation of the organic layers. Suitable pasture plants are pangolagrass, improved bahiagrass, and white clover.

A well designed and maintained water control system can improve the suitability of this soil for cultivated crops. Excess water must be removed when crops are on the land, and the soil should be saturated with water at all other times. Fertilizers that contain phosphate, potash, and minor elements are needed. Sorghum and sod are the main crops grown.

Typically, this soil is characterized by the Freshwater Marshes and Ponds range site (fig. 9). This site can be identified by 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 long periods. If this range site is properly managed, using such practices as proper stocking, the potential for forage production is higher than that of any other range site. Chalky bluestem and blue maidencane dominate the drier parts of the Freshwater Marshes and Ponds range site, and maidencane is dominant in the wetter parts. Other desirable forage plants include cutgrass, bluejoint panicum, sloughgrass, and low panicums. Periodic high water levels provide a natural deferment from excessive grazing. Carpetgrass, an introduced plant, tends to dominate the drier parts of this site under excessive grazing conditions.

This soil is not suited to urban development.

This Samsula soil is in capability subclass VIIw.

35—Satellite fine sand. This soil is deep, nearly level, and somewhat poorly drained. It is on low knolls and ridges on flatwoods. Slope is 0 to 2 percent.

Typically, this Satellite soil has a gray fine sand surface layer about 4 inches thick. The underlying material to a depth of about 80 inches is white fine sand.

Included with this soil in mapping are small areas of Punta, Tavares, and Zolfo soils. Punta soils are in a slightly lower landscape position than that of the Satellite soil and have a well developed subsoil below a depth of 50 inches. Tavares soils are better drained. Zolfo soils are in the same landscape position as the Satellite soil and have a subsoil below a depth of 50 inches. In places are some soils that have colors similar to those of the Satellite soil and are moderately well drained. The included soils make up about 15 percent of the map unit.

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

This soil is only moderately suited to pasture because of droughtiness and very low fertility. Fertilizer and lime are needed on a regular basis.

Typically, this soil is characterized by the Sand Pine Scrub range site. This site can be identified by a fairly dense stand of sand pine trees and a dense understory of oaks, saw palmetto, and other shrubs. Because of past timber management practices, sand pines are not in all areas of this range site. The droughty nature of this soil limits the potential for producing native forage. If this range site is properly managed, using such practices as deferred grazing and brush control, it has the potential to provide limited amounts of lopsided indiangrass, creeping bluestem, and beaked panicum. Livestock generally do not use this range site if more productive sites are available. Summer shade, winter protection, and dry bedding during the wet seasons are provided on this range site.

This Satellite soil is not suited to cultivated crops.

In its natural condition, this soil is poorly suited to citrus because of droughtiness, very low fertility, and wetness. It can be made suitable by installing a water control system that maintains the water table at an effective depth. Trees should be planted on beds to increase the effective depth to the water table, and a plant cover should be maintained between the trees. Frequent applications of fertilizer and lime are generally needed to improve soil quality. Because of the droughty nature of this soil, irrigation is essential particularly in the dry season. Micro-jet irrigation systems work well on this soil.

This soil has moderate potential productivity for longleaf pine. Equipment limitations, seedling mortality, and plant competition are major concerns in management.

This soil is moderately suited to urban development. Drainage is needed to overcome wetness, and fill

Figure 9.—Samsula muck, depressional, is used mainly as native range.

material is needed for most urban uses. Preserving the existing plant cover during construction helps to control erosion.

This Satellite soil is in capability subclass VIs.

36—Smyrna fine sand. This soil is deep, nearly level, and poorly drained. It is on flatwoods. Slope is 0 to 2 percent.

Typically, this Smyrna soil has a dark gray fine sand surface layer about 6 inches thick. The subsurface layer to a depth of about 12 inches is gray fine sand. The subsoil to a depth of about 19 inches is fine sand that is dark reddish brown in the upper part and dark yellowish brown in the lower part. The next layer to a depth of about 37 inches is light yellowish brown fine sand. To a depth of 80 inches, the subsoil is fine sand that is very dark grayish brown in the upper part and dark reddish brown in the lower part.

Included with this soil in mapping are small areas of Myakka, Immokalee, Basinger, and EauGallie soils. Myakka and Immokalee soils are in slightly higher positions on the landscape and have a deeper subsoil than the Smyrna soil. Basinger soils are in lower positions on the landscape and have a slightly darkened sandy subsoil. EauGallie soils are in landscape positions similar to those of the Smyrna soil and have a loamy subsoil below a depth of 40 inches. The included soils make up about 15 percent of the map unit.

This Smyrna soil has a high water table within a depth of 12 inches for 1 to 4 months during most years. The available water capacity is low. The permeability is moderate or moderately rapid.

This soil is well suited to pasture. Excessive water on the surface can be removed by shallow ditches. Fertilizer and lime are needed for optimum growth of grasses and legumes. Suitable pasture plants are pangolagrass, improved bahiagrass, and white clover. Grazing management, brush control, protection from wildfire, and proper location of stockwater and fences are needed.

Typically, this soil is characterized by the South Florida Flatwoods range site (fig. 10). This site can be identified by scattered pine trees and an understory of saw palmetto and grasses. If this range site is properly managed, using such practices as deferred grazing and brush control, it has the potential to produce significant amounts of creeping bluestem, lopsided indiangrass, chalky bluestem, and various panicums. As range deterioration occurs because of poor grazing management, this site is dominated by saw palmetto and pineland threeawn (wiregrass).

In its natural condition, this soil is poorly suited to cultivated crops because of wetness and poor soil quality. Only a limited number of crops can be grown unless very intensive management practices are used; however, this soil can be made suitable for several

Figure 10.—Pine trees, saw palmetto, and grasses make up the native range on Smyrna fine sand.

vegetable crops. A water control system is needed to remove excess water in wet seasons and to provide water for subsurface irrigation in dry seasons. A flow-through irrigation system works well on this soil. The organic matter content can be maintained by using all crop residue, planting cover crops, and using a suitable cropping system. Crops respond well to lime and fertilizer. Cucumbers, bell peppers, squash, and watermelons are the main crops grown.

In its natural condition, this Smyrna soil is poorly suited to citrus. It can be made suitable by installing a water control system that maintains the water table at an effective depth. Trees should be planted on beds to increase the effective depth to the water table, and a plant cover needs to be maintained between the trees. Fertilizer and lime are needed on a regular basis.

This soil has moderate potential productivity for slash pine. Equipment limitations, seedling mortality, and plant competition are major concerns in management. Bedding of rows helps in establishing seedlings by increasing the depth to the water table.

In its natural condition, this soil is poorly suited to urban development. Drainage is needed to overcome wetness, and fill material is needed for most urban uses. Preserving the existing plant cover during construction helps to control erosion.

This Smyrna soil is in capability subclass IVw.

37—Tavares fine sand, 0 to 5 percent slopes. This soil is deep and moderately well drained. It is on nearly level and gently sloping ridges.

Typically, this Tavares soil has a dark grayish brown fine sand surface layer about 6 inches thick. The underlying material to a depth of 80 inches or more is fine sand. It is light yellowish brown to a depth of 11 inches, very pale brown to a depth of 54 inches, and white below that depth.

Included with this soil in mapping are small areas of Zolfo and Pomello soils. These soils are in slightly lower positions on the landscape than the Tavares soil. Zolfo soils have a dark subsoil more than 50 inches below the surface. Pomello soils have a well expressed, dark subsoil within 30 to 50 inches of the surface. In places are some soils that are moderately well drained and have a slightly darkened subsoil. The included soils make up about 15 percent of the map unit.

This Tavares soil has a high water table at a depth of 42 to 72 inches for 1 to 4 months during most years. The available water capacity is very low. The permeability is rapid or very rapid.

In its natural condition, this soil is only moderately suited to pasture because of droughtiness and low fertility. Drought-tolerant species are suitable for planting. Fertilizer and lime are needed for optimum growth of grasses and legumes. Suitable pasture plants are pangolagrass and improved bahiagrass. Grazing management, brush control, protection from wildfire, and proper location of stockwater and fences are needed.

Typically, this soil is characterized by the Longleaf Pine-Turkey Oak Hills range site. This range site generally is on rolling land that has nearly level to strong slopes. It is easily recognized by the landform and by the dominant vegetation of longleaf pine and turkey oak. The natural fertility is low because of the rapid movement of plant nutrients and water through the soil. The forage production and quality are poor, and cattle do not readily utilize this range site if other sites are available. Proper stocking is needed. Desirable forage plants include creeping bluestem, lopsided indiangrass, and low panicums.

In its natural condition, this Tavares soil is poorly suited to most cultivated crops because of droughtiness and rapid leaching of plant nutrients. It can be made suitable by installing the proper irrigation system and supplying sufficient plant nutrients. Crops respond well to lime and fertilizer.

This soil is well suited to citrus (fig. 11). Micro-jet irrigation systems work well to provide sufficient water. This soil has moderately high potential productivity for longleaf pine. Equipment limitations, seedling mortality, and plant competition are the main concerns in management.

This soil is well suited to urban development.

This Tavares soil is in capability subclass IIIs.

38—Terra Ceia muck, depressional. This soil is deep, nearly level, and very poorly drained. It is in marshes, swamps, and depressions. Slope is 0 to 1 percent.

Typically, this Terra Ceia soil has a muck surface layer about 58 inches thick. It is black in the upper part and dark reddish brown in the lower part. The underlying material is dark gray loamy sand in the upper part. The lower part to a depth of about 80 inches is light brownish gray sandy clay.

Included with this soil in mapping are small areas of Floridana, Gator, and Samsula soils. Floridana soils are mineral soils that have a thick, dark colored surface layer and a loamy subsoil. Gator soils are organic soils that have loamy material at a depth of 16 to 51 inches. Samsula soils are organic soils that have sandy material at a depth of 16 to 51 inches. The included soils make up about 15 percent of the map unit.

Figure 11.—Tavares fine sand, 0 to 5 percent slopes, is used mainly for citrus. Irrigation is necessary for optimum management.

This Terra Ceia soil has a high water table that usually covers the surface for 6 months or more. The available water capacity is very high. The permeability is rapid. If this soil is drained, the organic material initially shrinks on drying to about half the original thickness and then subsides further as a result of compaction and oxidation. These losses are most rapid during the first 2 years this soil is drained. If drainage is continued, this soil continues to subside at the rate of about 1 inch per year. The lower the water table, the more rapid the loss.

In its natural condition, this soil is not suited to improved pasture, cultivated crops, citrus, or commercial pine tree production. Baldcypress has been planted in a few areas of this soil.

If water is properly controlled, this soil can be made suitable for improved pasture. The water control system should maintain the water table near the surface to prevent excessive oxidation of the organic layers. Suitable pasture plants are pangolagrass, improved bahiagrass, and white clover.

A well designed and maintained water control system can improve the suitability of this soil for cultivated crops. Excess water must be removed when crops are on the land, and the soil should be saturated the rest of the time. Fertilizers that contain phosphate, potash, and minor elements are needed. All crop residue and cover crops should be used to maintain organic matter. Sorghum and sod are the main crops grown.

Typically, this soil is characterized by the Freshwater Marshes and Ponds range site. This site can be identified by 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 long periods. If this range site is properly managed, using such practices as proper stocking, the potential for forage production is higher than that of any other range site. Chalky bluestem and blue maidencane dominate the drier parts of the Freshwater Marshes and Ponds range site, and maidencane is dominant in the wetter parts. Other desirable forage plants include cutgrass, bluejoint panicum, sloughgrass, and low panicums. Periodic high water levels provide a natural deferment from excessive grazing. Carpetgrass, an introduced plant, tends to dominate the drier parts of this site under excessive grazing conditions.

This soil is not suited to urban development.

This Terra Ceia soil is in capability subclass VIIw.

39—Terra Ceia muck, frequently flooded. This soil is deep, nearly level, and very poorly drained. It is on the Peace River flood plain in the southern part of the county. Slope is 0 to 1 percent.

Typically, this Terra Ceia soil has a very dark brown muck surface layer about 12 inches thick. The next layer to a depth of about 72 inches is very dark grayish brown muck. The underlying material to a depth of about 80 inches is light brownish gray sand.

Included with this soil in mapping are small areas of Gator and Samsula soils. These soils are in landscape positions similar to those of the Terra Ceia soil. Gator soils have loamy material within 51 inches of the surface, and Samsula soils have sandy material within 51 inches of the surface. The included soils make up about 20 percent of the map unit.

This Terra Ceia soil has a high water table within a depth of 12 inches for 6 to 12 months during most years. Flooding in most years is for a very long duration. The available water capacity is very high. The permeability is rapid.

The natural vegetation is mostly red maple, bay trees, blackgum, water tupelo, cypress, and royal fern.

In its natural condition, this soil is not suited to improved pasture, cultivated crops, citrus, or commercial pine tree production because of a severe hazard of frequent flooding. Baldcypress, however, can be planted.

This soil is not suited to urban development.

This Terra Ceia soil is in capability subclass VIIw and is not assigned to a range site.

40—Valkaria fine sand. This soil is deep, nearly level, and poorly drained. It is in sloughs. Slope is 0 to 1 percent.

Typically, this Valkaria soil has a dark gray fine sand surface layer about 6 inches thick. The subsurface layer to a depth of 25 inches is fine sand that is gray in the upper part and pale brown in the lower part. The subsoil is brownish yellow fine sand to a depth of 31 inches. The substratum to a depth of about 80 inches is fine sand that is light gray in the upper part and grayish brown in the lower part.

Included with this soil in mapping are small areas of Pineda, Malabar, and Basinger soils. These soils are in positions on the landscape similar to those of the Valkaria soil. Pineda soils have a loamy subsoil less than 40 inches below the surface. Malabar soils have a loamy subsoil more than 40 inches below the surface. Basinger soils have a slightly darkened subsoil. The included soils make up about 10 percent of the map unit.

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

This soil is well suited to pasture. Excessive water on the surface can be removed by shallow ditches. Suitable pasture plants are pangolagrass, improved bahiagrass, and white clover. Grazing management, brush control, protection from wildfire, and proper location of stockwater and fences are needed.

Typically, this soil is characterized by the Slough range site. This site can be identified by an open expanse of grasses, sedges, and rushes in an area where the soil is saturated during the rainy season. If this range site is properly managed, using such practices as deferred grazing, the potential for forage production is almost as high as that of the Freshwater Marshes and Ponds range site. Desirable forage plants include blue maidencane, maidencane, chalky bluestem, toothachegrass, and South Florida bluestem. Carpetgrass, an introduced plant, tends to dominate this site under excessive grazing conditions.

In its natural condition, this Valkaria soil is poorly suited to cultivated crops because of wetness and poor soil quality. Only a limited number of crops can be grown unless very intensive management practices are used; however, this soil can be made suitable for several vegetable crops. A water control system is needed to remove excess water in wet seasons and to provide water for subsurface irrigation in dry seasons.

In its natural condition, this soil is poorly suited to citrus. It can be made suitable by installing a water control system that maintains the water table at an effective depth. Trees should be planted on beds to increase the effective depth to the water table, and a plant cover needs to be maintained between the trees. Fertilizer and lime are needed on a regular basis.

This soil has moderately high potential productivity for slash pine. Equipment limitations, seedling mortality, and plant competition are major concerns in management. Bedding of rows helps in establishing seedlings by increasing the depth to the water table.

In its natural condition, this soil is poorly suited to urban development. Drainage is needed to overcome wetness, and fill material is needed for most urban uses.

This Valkaria soil is in capability subclass IVw.

41—Wabasso fine sand. This soil is deep, nearly level, and poorly drained. It is on flatwoods. Slope is 0 to 2 percent.

Typically, this Wabasso soil has a dark gray sand surface layer about 7 inches thick. The subsurface layer to a depth of about 26 inches is fine sand that is gray in the upper part and light gray in the lower part. The subsoil extends to a depth of 80 inches. It is black fine sand in the upper part, brown and grayish brown fine sandy loam in the middle part, and gray sandy clay loam in the lower part.

Included with this soil in mapping are small areas of Myakka, Smyrna, EauGallie, and Farmton soils. Myakka and Smyrna soils are in the same position on the landscape as the Webasso soil, but they do not have a loamy subsoil. EauGallie soils have a deeper, loamy subsoil. Farmton soils are in a slightly higher position on the landscape and have thicker surface and subsurface layers. The included soils make up about 15 percent of the map unit.

This Wabasso soil has a high water table within a depth of 12 inches for 1 to 4 months during most years. The available water capacity is low. The permeability is slow or very slow.

This soil is well suited to pasture. Excessive water on the surface can be removed by shallow ditches. Fertilizer and lime are needed for optimum growth of grasses and legumes. Suitable pasture plants are pangolagrass, improved bahiagrass, and white clover. Grazing management, brush control, protection from wildfire, and proper location of stockwater and fences are needed.

Typically, this soil is characterized by the South Florida Flatwoods range site. This site can be identified by scattered pine trees and an understory of saw palmetto and grasses. If this range site is properly managed, using such practices as deferred grazing and brush control, it has the potential to produce significant amounts of creeping bluestem, lopsided indiangrass, chalky bluestem, and various panicums. As range deterioration occurs because of poor grazing management, this site is dominated by saw palmetto and pineland threeawn (wiregrass).

In its natural condition, this soil is poorly suited to cultivated crops because of wetness and poor soil quality. Only a limited number of crops can be grown unless very intensive management practices are used; however, this soil can be made suitable for several vegetable crops. A water control system is needed to remove excess water in wet seasons and to provide water for subsurface irrigation in dry seasons. The organic matter content can be maintained by using all crop residue, planting cover crops, and using a suitable cropping system. Crops respond well to lime and fertilizer. Cucumbers, bell peppers, squash, and watermelons are the main crops grown.

In its natural condition, this Wabasso soil is poorly suited to citrus. It can be made suitable by installing a water control system that maintains the water table at an effective depth. Trees should be planted on beds to increase the effective depth to the water table, and a plant cover needs to be maintained between the trees. Fertilizer and lime are needed on a regular basis.

This soil has moderately high potential productivity for slash pine. Equipment limitations, seedling mortality, and plant competition are major concerns in management. Bedding of rows helps in establishing seedlings by increasing the depth to the water table.

In its natural condition, this soil is poorly suited to urban development. Drainage is needed to overcome wetness, and fill material is needed for most urban uses. Preserving the existing plant cover during construction helps to control erosion.

This Wabasso soil is in capability subclass IIIw.

42—Zolfo fine sand. This soil is deep, nearly level, and somewhat poorly drained. It is on low ridges on flatwoods. Slope is 0 to 2 percent.

Typically, this Zolfo soil has a gray fine sand surface layer about 5 inches thick. The subsurface layer to a depth of about 59 inches is fine sand. It is grayish brown in the upper part, pale brown in the middle part, and light yellowish brown in the lower part. The subsoil to a depth of about 80 inches is fine sand that is dark brown in the upper part and very dark brown in the lower part.

Included with this soil in mapping are small areas of Tavares soils. Tavares soils are in slightly higher positions on the landscape than the Zolfo soil. They are better drained and do not have a subsoil. In places are small areas of soils that have a shallower seasonal high water table and do not have a subsoil. The included soils make up about 15 percent of the map unit.

This Zolfo soil has a high water table at a depth of 18 to 36 inches for 1 to 4 months during most years. The available water capacity is low. The permeability is moderate.

This soil is only moderately suited to pasture because of droughtiness and low fertility. Fertilizer and lime are needed on a regular basis. Suitable pasture plants are pangolagrass, improved bahiagrass, and white clover.

Typically, this soil is characterized by the Longleaf Pine-Turkey Oak Hills range site. This site is easily recognized by the dominant vegetation of longleaf pine and turkey oak. The natural fertility is low because of the rapid movement of plant nutrients and water through the soil. The forage production and quality are poor, and cattle do not readily utilize this range site if other sites are available. Proper stocking is needed. Desirable forage plants include creeping bluestem, lopsided indiangrass, and low panicums.

In its natural condition, this Zolfo soil is poorly suited to cultivated crops because of periodic wetness; however, it can be made suitable by installing a proper drainage system. Regular applications of fertilizer and lime are needed.

In its natural condition, this soil is only moderately suited to citrus because of wetness. It can be made suitable by installing a water control system that maintains the water table at an effective depth. Trees should be planted on beds to increase the effective depth to the water table, and a plant cover should be maintained between the trees. Fertilizer and lime are needed on a regular basis.

This soil has moderate potential productivity for slash pine. Equipment limitations, seedling mortality, and plant competition are major concerns in management.

Because of wetness, this soil is only moderately suited to urban development; however, a drainage system can help to overcome this limitation.

This Zolfo soil is in capability subclass IIIw.

Use and Management of the Soils

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

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

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

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

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

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

Crops and Pasture

John D. Lawrence, state conservation agronomist, and Steven Mozley, area range conservationist, 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.

According to estimates from Primary Sampling Units of the National Resource Inventory, about 263,000 acres in DeSoto County was used for crops and pasture. Of this, 213,000 acres was used for pasture, more than 41,000 acres was used for citrus, and 9,000 acres was used for special crops, mainly cucumbers, watermelons, cantaloupes, peppers, squash, sod, and nursery plants.

The potential for increased food production is good. About 4,000 acres of potentially good cropland currently is used as woodland. Additional land that is presently used as woodland or pasture could be used as cropland, but intensive conservation measures are needed to control soil blowing in those areas. In addition, food production could be increased considerably by extending the latest technology to all cropland in the county. This soil survey can greatly facilitate the application of such technology.

Soil erosion generally is a hazard on the more sloping soils if the surface is not protected by a plant cover. Erosion is also a hazard if the slope is more than 2 percent on the moderately well drained Tavares soil.

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

Erosion control practices provide a protective surface cover, reduce runoff, and increase infiltration. A cropping system that keeps a plant cover on the soil for extended periods can hold soil losses to amounts that do not reduce the productive capacity of the soils. On livestock farms that require pasture and hay, the legumes and grasses grown for forage in the cropping system can reduce erosion on sloping soils. They also provide nitrogen and improve tilth for the following crop. Minimizing tillage and leaving crop residue on the surface increase infiltration and reduce runoff and erosion. These practices can be adapted to most soils in the survey area.

Soil blowing is a major hazard on sandy and organic soils. It damages or destroys crops by sandblasting; spreads plant diseases, insects, and weed seeds; and creates health hazards and cleaning problems. Soil blowing can damage soils and tender crops in a few hours 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. About three-fourths of the cropland in DeSoto County is subject to soil blowing.

Wind erosion reduces soil fertility by removing the finer soil particles and organic matter from the soil. Control of wind erosion minimizes duststorms and improves the quality of air.

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

Soil drainage is a major management concern on much of the acreage used for crops in the survey area. Some soils are naturally so wet that the production of crops common to the area is generally not practical. These are the poorly drained Basinger, Bradenton, EauGallie, Farmton, Felda, Immokalee, Malabar, Myakka, Ona, Pineda, Pinellas, Pompano, Punta, Smyrna, Valkaria, and Wabasso soils. Soil drainage is also a concern on much of the acreage used for pasture; however, excess water on the surface can be removed by shallow ditches.

Unless bedded, the somewhat poorly drained soils in some areas are wet enough in the root zone to cause damage to citrus crops in most years during the wet seasons. Included in this category are Cassia, Satellite, and Zolfo soils.

The very poorly drained soils are very wet during rainy periods. Water stands on the surface in most areas of these soils, and the production of good quality pasture is not possible if artificial drainage is not used. Anclote, Chobee, Delray, Durbin, Floridana. Gator, Samsula, Terra Ceia, and Wulfert soils are very poorly drained. In addition, Durbin and Wulfert soils are affected by the daily rising and falling of tides containing salt and sulfur.

The design of surface drainage and subsurface irrigation systems varies with the kind of soil and the pasture. For intensive pasture production, a combination of these systems is needed. Information on the drainage and irrigation needed for each soil is contained in the "Technical Guide," which is available at local offices of the Soil Conservation Service.

Soil fertility is naturally low in most soils in the survey area. Most of the soils have a sandy surface layer and are light in color. Bradenton, Felda, Malabar, Pineda, and Pinellas soils have a loamy subsoil. Anclote, Pompano, Satellite, Tavares, Valkaria, and Zolfo soils have sandy material to a depth of 80 inches or more. Basinger, Cassia, EauGallie, Farmton, Immokalee, Myakka, Ona, Pomello, Punta, Smyrna, and Wabasso soils have a dark colored sandy subsoil that has organic carbon.

The surface layer in most of the soils is strongly acid or very strongly acid. Applications of ground limestone are 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. Additions of lime and fertilizer should be based on the results of soil tests, on the needs of the crops, and on the expected level of yields. The Cooperative Extension Service can help in determining 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.

Except for the Anclote, Chobee, Delray, Floridana, Gator, Terra Ceia, and Samsula soils, the soils in DeSoto County have a sandy surface layer that is high in content of organic matter. Gator, Terra Ceia, and Samsula soils are organic soils and have an organic surface layer. Generally, the structure of the surface layer of most soils is weak. Most of the moderately well drained soils and the somewhat poorly drained Satellite soils are low in content of organic matter and are droughty. Planting cover crops adds organic matter, which improves soil structure and increases the available water capacity of the soil.

Field crops are grown on a small acreage in DeSoto County. The acreage of corn, grain sorghum, sunflowers, and sugarcane could be increased if economic conditions warrant an increase. Rye is the most common close-growing crop.

Special crops grown commercially are citrus, watermelons, cantaloupes, cucumbers, peppers, squash, nursery plants, and sod. If economic conditions are favorable, the acreage of nursery plants and sod can be increased.

If irrigated, the Tavares soils are very well suited to citrus and vegetables. If adequately drained, the Basinger, Bradenton, EauGallie, Farmton, Felda, Immokalee, Malabar, Myakka, Ona, Pineda, Pinellas, Pompano, Punta, Smyrna, Valkaria, and Wabasso soils are well suited to vegetables and citrus. 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 special crops can be obtained from local offices of the Cooperative Extension Service and the Soil Conservation Service.

Pasture is used to produce forage for beef and dairy cattle. Commercial cow-calf operations are the major livestock production systems. These beef cattle operations range from several hundred animals to smaller operations that have a hundred animals or less. The larger operations generally depend upon a combination of rangeland and tame (introduced or improved) perennial pasture for forage, while smaller operations generally use only tame pastures. Common tame pasture grasses include bahiagrass, limpograss, and bermudagrass. Bahiagrass is the most popular. Key rangeland grasses include creeping bluestem, chalky bluestem, lopsided indiangrass, and maidencane.

In recent years, higher fertilizer and equipment costs have slowed the conversion of rangeland to pastureland. Some Florida ranchers, aware of the value of our native grasses, have moved away from the intensive agronomic management approach to a more extensive ecologically based management of Florida's resources.

The moderately well drained Tavares soil is moderately suited to bahiagrass, improved bermudagrass, and pangolagrass. If this soil is properly managed, hairy indigo, alsike clover, and aeschynomene can be grown in summer and fall.

The somewhat poorly drained Zolfo soil is moderately suited to bahiagrass, improved bermudagrass, and legumes, such as sweet clover, but adequate lime and fertilizer are needed.

If drained, Basinger, Bradenton, EauGallie, Farmton, Felda, Pinellas, Pompano, Punta, Smyrna, Valkaria, and Wabasso soils are well suited to bahiagrass and hemarthria grass. Subsurface irrigation increases the length of the growing season and total forage production. Legumes, such as white clover, are suitable if adequate amounts of lime and fertilizer are added to the soil.

In some parts of the county, pasture is greatly depleted by continuous excessive grazing. Yields of pasture are increased by adding lime and fertilizer, and most important of all, by practicing good grassland management.

Differences in the amount and kind of pasture yields are closely related to the kind of soil. Management of pasture is based on the relationship of soils, pasture plants, lime, fertilizer, moisture, and management. The latest information about pasture can be obtained from local offices of the Cooperative Extension Service and the Soil Conservation Service.

Expected yields of bahiagrass, under optimum management, are shown in table 5. The yields are in animal unit months (AUM), which is the amount of forage needed for one cow and her calf for 1 month. Table 7 gives the pounds per acre of forage that can be expected from rangeland.

Yields Per Acre

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

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

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

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the crops grown, that good quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

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

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

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for use as cropland. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria 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.

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

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

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

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

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

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

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

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main 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); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

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

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."

Range and Grazeable Woodland

Steven Mozley, area range conservationist, Soil Conservation Service, helped prepare this section.

Native range plants provide a significant part of the year-round supply of forage for livestock in DeSoto County. This forage is readily available, is economical, and provides important roughage needed by cattle. With today's high costs, the economical maintenance of tame pastures is a major challenge on the low fertility soils of

Florida. These factors have sparked a renewed interest that is moving away from the intensive agronomic management approach to a more extensive ecologically based management of Florida's forage resources.

About 96,000 acres throughout the county is used as native range by domestic livestock. Of this, 94,000 acres is used strictly as range and 2,000 acres is grazeable woodland.

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 or that are suited to 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 natural 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 is the amount of vegetation that can be expected to grow annually on well managed rangeland that is supporting the climax plant community. Total 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 a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture.

Dry weight is the total annual yield per acre of air-dry vegetation. Yields are adjusted to a common percent of air-dry moisture content. The relationship of green weight to air-dry weight varies according to such factors as exposure, amount of shade, recent rains, and unseasonable dry periods.

Range management requires a knowledge of the kinds of soil and of the 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 potential 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 have a specific meaning that pertains to the present plant community in a given use.

The objective in range management is to control grazing so that range plants growing on a site are about the same in kind and amount as we would expect to find in an undisturbed 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 water and wind erosion. Sometimes, it is desirable to manage the range condition somewhat below the potential if it meets grazing needs, provides wildlife habitat, protects soil and water resources, and is ecologically and economically sound.

The range sites in DeSoto County are Freshwater Marshes and Ponds, Longleaf Pine-Turkey Oak Hills, Sand Pine Scrub, Slough, South Florida Flatwoods, Salt Marsh, and Cabbage Palm Hammock.

Grazeable woodland is forest that has understory of native grasses, legumes, and forbs. The understory is an integral part of the forest plant community. The native plants can be grazed without significantly impairing other forest values. On such forest land, grazing is compatible with timber management if the grazing is controlled or managed in such a manner that timber and forage resources are maintained or enhanced.

Understory vegetation consists of grasses, forbs, shrubs, and other plants used by livestock or by grazing or browsing wildlife. A well managed wooded area can produce enough understory vegetation to supply food to large numbers of livestock and wildlife.

The amount of forage production varies according to the different kinds of grazeable woodland, the amount of shade cast by the canopy, the accumulation of fallen needles, the influence of time and intensity of grazing on the herbage, and the number, size, and spacing of tree plantings. The method of site preparation is also important.

Woodland Management and Productivity

Dave Ultley, forest area supervisor, Florida Department of Agriculture and Consumer Service, Division of Forestry, helped prepare this section.

DeSoto County provides an excellent opportunity for timber management; however, because the county was too far from the coast for development by early land speculators, most of the pine flatwoods were cleared for agricultural purposes, especially for rangeland and citrus production. The recent problems affecting these markets have drastically reduced profits, and timber production has become more attractive to many landowners.

Pine pulpwood prices have more than tripled in the last 15 years and are projected to keep rising steadily. Timber management has always been considered a long-term investment with a return in 20 to 25 years. Comparisons among tracts of land recently sold, however, proved that those with an established pine plantation sell for a higher price than those with scattered trees.

Hardwood species, such as oak, gum, and red maple, generally are in lower lying areas, especially along streambeds or swamp margins. These forests provide excellent wildlife habitat and can be managed to provide good hunting. They also yield some choice hardwood sawtimber, which is used mainly for pallet material or railroad ties.

Baldcypress is the most valuable timber species in DeSoto County. The majority of the cypress heads were harvested some time ago. Regeneration from these cutover stands should be ready for a second harvest in 10 to 20 years.

Soils vary in their ability to produce trees. Depth, fertility, texture, and the available water capacity influence tree growth. Elevation, aspect, and climate determine the kinds of trees that can grow on a site. Available water capacity and depth of the root zone have major effects on tree growth.

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. For each map unit in the survey area suitable for producing timber, the section "Detailed Soil Map Units" presents information about productivity, limitations for 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 for use and management. The letter *W* indicates a soil in which excessive water, either seasonal or year-round, causes a significant limitation. The letter *S* indicates a dry, sandy soil. If a soil has more than one limitation, the priority is as follows: W and 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. On the steeper slopes, tracked equipment must be used. On the steepest slopes, even tracked equipment cannot operate; more sophisticated systems are needed. The rating is *slight* if equipment use is restricted by soil wetness for less than 2 months and if special equipment is not needed. The rating is *moderate* if slopes are steep enough that wheeled equipment cannot be operated safely across the slope, if soil wetness restricts equipment use from 2 to 6 months per year, if stoniness restricts ground-based equipment, or if special equipment is needed to avoid or reduce soil compaction. The rating is *severe* if slopes are steep enough that tracked equipment cannot be operated safely across the slope, if soil wetness restricts equipment use for more than 6 months per year, if stoniness restricts ground-based equipment, or if special equipment is needed to avoid or reduce soil compaction. Ratings of *moderate* or *severe* indicate a need to choose the most suitable equipment and to carefully plan the timing of harvesting and other management operations.

Ratings of *seedling mortality* refer to the probability of death of naturally occurring or properly planted seedlings of good stock in periods of normal rainfall as influenced by kinds of soil or topographic features. Seedling mortality is caused primarily by too much water or too little water. The factors used in rating a soil for seedling mortality are texture of the surface layer, depth and duration of the water table, rock fragments in the surface layer, rooting depth, and the aspect of the slope. Mortality generally is greatest on soils that have a sandy or clayey surface layer. The risk is *slight* if, after site preparation, expected mortality is less than 25 percent; *moderate* if expected mortality is between 25 and 50 percent; and *severe* if expected mortality exceeds 50 percent. Ratings of *moderate* or *severe* indicate that it may be necessary to use containerized or larger than usual planting stock or to make special site preparations, such as bedding, furrowing, installing surface drainage, or providing artificial shade for seedlings. Reinforcement planting is often needed if the risk is *moderate* or *severe*.

Ratings of *windthrow hazard* 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, fragipan, or bedrock, or by a combination of such factors as soil wetness, texture, structure, and depth. The risk is *slight* if strong winds cause trees to break but do not uproot them; *moderate* if strong winds cause an occasional tree to be blown over and many trees to break; and *severe* if moderate or strong winds commonly blow trees over. Ratings of *moderate* or *severe* indicate the need for care in thinning or possibly not thinning. Specialized equipment may be needed to avoid damage to shallow root systems in partial cutting operations. A plan for periodic salvage of windthrown trees and the maintenance of a road and trail system may be needed.

Ratings of *plant competition* indicate the likelihood of the growth or invasion of undesirable plants. Plant competition becomes more severe on the more productive soils, on poorly drained soils, and on soils having a restricted root zone that holds moisture. The risk is *slight* if competition from undesirable plants 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 procedure and technique for determining site index are given in the site index tables used for this survey *(11, 13, 17)*.

The *productivity class* represents an expected volume produced by the most important trees, expressed in cubic meters per hectare per year. Cubic meters per hectare can be converted to cubic feet per acre by multiplying by 14.3. It can be converted to board feet by multiplying by a factor of about 71. For example, a productivity class of 8 means the soil can be expected to produce 114 cubic feet per acre per year at the point where mean annual increment culminates, or about 568 board feet per acre per year.

Trees to plant are those that are used for reforestation or, if suitable conditions exist, natural regeneration. They are suited to the soils and will produce a commercial wood crop. Desired product, topographic position (such as a low, wet area), and personal preference are three factors of many that can influence the choice of trees to use for reforestation.

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 insure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Additional information on planning windbreaks and screens and 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

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 favorable and that any limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset 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.

DeSoto County has some large areas of good wildlife habitat. The best areas are along the Peace River and larger creeks. The large areas of relatively undisturbed flatwoods also provide good habitat for wildlife. The acreage that has been converted to citrus and improved pasture does not provide as valuable wildlife habitat, and the complete clearing of wildlife cover for vegetable farming and tame pasture rotations has been very detrimental for wildlife.

The primary game species are white-tailed deer, wild turkey, bobwhite quail, gray squirrel, mourning dove, and feral hogs. Other wildlife includes gray fox, skunk, burrowing owls, snipe, raccoon, opossum, bobcat, armadillo, and a variety of songbirds, woodpeckers, wading birds, reptiles, and amphibians. The wood duck is a year-round resident of the wooded swamps, and the Florida duck is in marsh areas.

Species that are listed as endangered or threatened include the Bald eagle, the American alligator, and the wood stork. A number of other threatened species may be in DeSoto County. A detailed list of endangered and threatened wildlife with information on range and habitat is available from 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, browntop millet, and grain sorghum.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are bahiagrass, panolagrass, deervetch, clover, and sesbania.

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

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, saw palmetto, gallberry, cabbage palm, elderberry, and catbriers. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are American beautyberry and pyracantha.

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, 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, maidencane, cattail, rushes, sedges, and reeds.

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

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

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

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, owls, thrushes, woodpeckers, squirrels, gray fox, raccoon, and deer.

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

Engineering

In 1980, about 11,000 acres in the county was in urban uses. This acreage has increased about 10 percent a year for the past 10 years, according to estimates of the Central Florida Regional Planning Council.

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

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

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

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

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

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

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

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

Building Site Development

Table 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 favorable for the indicated use and limitations 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. Thé ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer, stone content, soil texture, and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

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

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

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

Sanitary Facilities

Table 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 favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are moderately favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if one or more soil properties or site features are unfavorable and if special design, extra maintenance, or alteration is required.

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, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

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

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

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

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

The ratings in table 12 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, depth to a water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

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

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

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 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, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

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

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

Water Management

Table 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 favorable for the indicated use and limitations 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 so unfavorable that special design, increased maintenance, or alteration of the site may be required.

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

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

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

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

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

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

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

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

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics. These results are reported in table 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 ⅓ bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

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

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

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

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimohs per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

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

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

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

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion. Losses are expressed in tons per acre per year. These estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

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

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

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

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

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

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

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

5. Loamy soils that are less than 20 percent clay and less than 5 percent finely divided calcium carbonate and sandy clay loams and sandy clays that are less than 5 percent finely divided calcium carbonate. These soils are slightly erodible. Crops can be grown if measures to control soil blowing are used.

6. Loamy soils that are 20 to 35 percent clay and less than 5 percent finely divided calcium carbonate, except silty clay loams. These soils are very slightly erodible. Crops can easily be grown.

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

8. Stony or gravelly soils and other soils not subject to soil blowing.

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.

Some of the soils in table 17 are shown as having dual hydrologic groups, such as B/D. A B/D listing means that under natural conditions the soil belongs to hydrologic group D, but by artificial methods the water table can be lowered sufficiently so that the soil fits in hydrologic group B. Since there are different degrees of drainage or water table control, onsite investigation is needed to determine the hydrologic group of the soil at 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, artesian*, 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. Table 18 gives data on the depth to the water table in some of the soils in the survey area.

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

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

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. Table 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

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Parameters for physical, chemical, and mineralogical properties of representative pedons sampled in DeSoto County are 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 DeSoto 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 *(16)*.

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 ($\frac{1}{10}$ bar) and 345 centimeters water ($\frac{1}{3}$ 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. The sum of cations, which can be considered a measure of cation-exchange capacity, was calculated by adding the values for extractable bases and extractable acidity. Base saturation is the ratio of extractable bases to cation-exchange capacity expressed in percent. The pH measurements were made with a glass electrode using a soil-water ratio of 1:1; a 0.01 molar calcium chloride solution in a 1:2 soil-solution ratio; and normal potassium chloride solution in a 1:1 soil-solution ratio.

Electrical conductivity determinations were made with a condutivity 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, 7.2, and 4.31 angstrom positions represent montmorillonite, interstratified expandable vermiculite or 14 angstrom intergrades, kaolinite, and quartz, respectively. Peaks were measured, summed, and normalized to give the percent of soil minerals identified in the x-ray diffractograms. These percentage values do not indicate absolute determined quantities of soil minerals but do imply a relative distribution of minerals in a particular mineral suite. Absolute percentages would require additional knowledge of particle size, crystallinity, unit structure substitution, and matrix problems.

Most soils sampled for laboratory analyses in DeSoto County were inherently 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 of all soils. Basinger, Ona, Pomello, Pompano, Satellite, Smyrna, Tavares, Valkaria, and Zolfo soils contained more than 90 percent total sand to a depth of 2 meters or more. EauGallie, Farmton, Immokalee, and Malabar 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. Frequently, but not always, silt content was slightly higher than the clay content. Deeper argillic horizons in the Bradenton, Chobee, EauGallie, Farmton, Malabar, and Wabasso soils contained enhanced amounts of clay ranging from 8.7 to 27.8 percent. Silt content exceeded 10 percent in one horizon of the Chobee soil but rarely exceeded 4 percent in horizons of other soils. Fine sand dominated the sand fractions in all horizons of all soils. At least one horizon of all soils sampled contained more than 50 percent fine sand. All horizons of Basinger, Immokalee, Ona, and Valkaria soils contained more than 70 percent fine sand. Very coarse sand was barely detectable in many soils and totally absent in the Basinger, Bradenton, Farmton, Immokalee, Malabar, Ona, Satellite, Smyrna, Tavares, and Zolfo soils. Coarse sand content was less than 1 percent in the Bradenton, Immokalee, and Ona soils and generally was less than 4 percent in other soils. Medium sand content generally ranged from 10 to 20 percent with somewhat lesser and somewhat greater amounts occurring in a few soils. The content of very fine sand generally ranged from 10 to 20 percent. Sandy soils in DeSoto County rapidly become droughty during periods of low precipitation when rainfall is widely scattered, and they are rapidly saturated when high amounts of rainfall occur.

Hydraulic conductivity values generally ranged from 20 to 40 centimeters per hour in the upper part of the solum and throughout the entire Typic Quartzipsamment pedons, but they rarely exceeded 0.5 centimeter per hour in the deeper argillic horizons. Higher clay content in the Bradenton and Chobee soils resulted in low hydraulic conductivity values at depths that could affect the design and function of septic tank absorption fields. Low hydraulic conductivity values were recorded for spodic horizons in the Farmton, Immokalee, Ona, and Smyrna soils, but the hydraulic conductivity values for the Bh horizon in the Zolfo soil were higher than those generally recorded for spodic horizons of most Florida soils. The available water for plants can be estimated from bulk density and water content data. Excessively sandy soils, such as Tavares and Satellite fine sands, retain very low amounts of available water. Conversely, soils that have a higher content of organic matter, such as Chobee muck, retain much larger amounts of available water.

Chemical soil properties (table 20) show that a wide range of extractable bases are in the soils of Desoto County. Except for the Bradenton and Chobee soils, these soils have one horizon or more that has less than 1 milliequivalent per 100 grams extractable bases. Bradenton soils ranged from 5.23 to 17.04, and Chobee soils ranged from 6.85 to 75.37 milliequivalents per 100 grams extractable bases. Pomello, Pompano, and Zolfo soils contained less than 1 milliequivalent per 100 grams extractable bases throughout the pedon. The mild, humid climate of DeSoto County results in depletion of basic cations (calcium, magnesium, sodium, and potassium) through leaching.

Calcium was the dominant base in all soils. Magnesium exceeded the amount of calcium in the argillic horizon of Farmton fine sand and in no more than one horizon of several other soils. All soils except the Farmton, Immokalee, Pomello, Pompano, Satellite, and Zolfo soils had one horizon in which the calcium content exceeded 2 milliequivalents per 100 grams. Extractable magnesium contents of 2 milliequivalents or more occurred only in one horizon or more of the Bradenton, Chobee, Samsula, and Wabasso soils. The highest amount of extractable calcium and magnesium occurred in the Chobee soil. Sodium generally occurred in amounts that were well less than 0.2 milliequivalents per 100 grams; however, the upper horizons of Chobee muck and Samsula muck exceeded this value. All soils had one horizon or more that had 0.07 milliequivalents per 100 grams or less extractable potassium. Basinger, EauGallie, Farmton, Immokalee, Malabar, Ona, Pomello, Pompano, Samsula, Satellite, Smyrna, Valkaria, Wabasso, and Zolfo 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 horizon of the Chobee, EauGallie, Immokalee, Samsula, and

Wabasso soils. An enhanced cation-exchange capacity paralleled the higher clay content in deeper horizons of Bradenton, EauGallie, Farmton, Malabar, and Wabasso soils. Soils that have low cation-exchange capacities in the surface horizon, such as the Malabar soil, require only small amounts of lime or sulfur to significantly alter both the base status and soil reaction. Generally, soils of low inherent soil fertility are associated with low values for extractable bases and low cation-exchange capacities. Fertile soils are associated with high values for extractable bases, high base saturation values, and high cation-exchange capacities.

The content of organic carbon was less than 1 percent in all horizons of the Malabar and Tavares soils and in all horizons below the surface layer in the Basinger, Bradenton, Farmton, Pompano, Satellite, and Valkaria soils. Chobee and Samsula soils have horizons with more than 6 percent organic carbon. The Bh horizon of the EauGallie, Farmton, Immokalee, Ona, Pomello, Smyrna, Wabasso, and Zolfo soils has enhanced amounts of organic carbon ranging from 0.79 percent in the Farmton soil to 3.11 percent in the Smyrna soil. In all other soils, organic carbon content decreased rapidly with pedon depth. Since the content of organic carbon in the surface horizon is directly related to soil nutrient- and water-holding capacities of sandy soils, management practices that conserve and maintain the amount of organic carbon are highly desirable.

Electrical conductivity values were all very low, ranging from nondetectable to 0.78 millimohs per centimeter, which occurred in the surface layer of Samsula muck. These data indicate that the soluble salt content of soils sampled in DeSoto County was insufficient to detrimentally affect the growth of salt sensitive plants.

Soil reaction in water ranged from pH 3.7 in the surface layer of the Pompano soil to pH 8.2 in the deepest horizon of the Bradenton soil. Values for soil reaction were frequently lower, from 0.5 to 1.0 pH units, when determined in potassium chloride and calcium chloride solutions. Maximum plant nutrient availability generally is attained when soil reaction is between pH 6.5 and 7.5; however, under Florida conditions, maintaining soil reaction above pH 6.5 is not economically feasible for most agricultural production purposes.

The ratio of pyrophosphate extractable carbon and aluminum to clay in the Bh horizon of EauGallie, Farmton, Immokalee, Ona, Pomello, Smyrna, Wabasso, and Zolfo soils was sufficient to meet chemical criteria established for 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 horizons of these soils.

Citrate-dithionite extractable iron in the Bt horizon of Bradenton, Chobee, EauGallie, Farmton, and Wabasso soils ranged from 0.03 to 1.4 percent. Aluminum extracted by citrate-dithionite from the Bt horizon in these soils ranged from 0.03 to 0.24 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 the soils in DeSoto County were not sufficient to detrimentally affect phosphorus availability.

Sand fractions of 2 to 0.05 millimeters were siliceous, and quartz was overwhelmingly dominant in all pedons. Small amounts of heavy minerals occurred in most horizons with the greatest concentrations in the very fine fraction. No weatherable minerals were observed. Crystalline mineral components of the clay fraction of less than 0.002 millimeter 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, and quartz.

A large amount of montmorillonite was in the Bradenton, Chobee, Samsula, and Wabasso soils. Montmorillonite was nondetectable in the Farmton, Ona, and Valkaria soils. The 14 angstrom intergrade was not detected in Bradenton, Chobee, and Samsula soils. Many soils had at least one horizon in which the 14 angstrom intergrade was not detected. Kaolinite occurred in all horizons for which determinations for clay identification were performed except in the Cg horizon of the Chobee soil, the Ap horizon of the EauGallie soil, the A horizon of the Pompano soil, and the Bh horizon of the Smyrna soil. Varying amounts of quartz occurred in all horizons of all pedons.

Montmorillonite appears to have been inherited by DeSoto County soils. Occurrence of relatively large amounts of montmorillonite in Bradenton and Chobee soils suggests that it is among the most stable mineral species in this neutral to alkaline weathering environment. The Chobee soil contained a large amount of clay, which was mostly montmorillonitic. Considerable volume change could result from shrinking upon drying and swelling upon wetting of montmorillonitic soil materials that have a high clay content. This soil property can be detrimental for most types of construction.

Large amounts of 14 angstrom intergrade minerals and quartz occurred in soils with an acidic environment. The stability of these mineral species appears to be enhanced under these weathering conditions. Clay-sized quartz has primarily resulted from decrements of the silt fraction. A tendency for kaolinite to increase as pedon depth increases exists, but it is somewhat inconsistent. Soils that are dominated by montmorillonite have a much higher cation-exchange capacity and retain more plant nutrients than soils dominated by 14 angstrom intergrade materials, kaolinite, and quartz. In most DeSoto County soils, the clay mineralogy influences use and management less frequently than the total clay content.

Engineering Index Test Data

Table 22 contains engineering test data determined by the Soils Laboratory, Florida Department of Transportation, Bureau of Materials and Research, for some of the major soil series in the county. These tests were made to help evaluate the soils for engineering purposes. The classifications given are based on data obtained by mechanical analyses and by tests to determine liquid limits and plastic limits.

The mechanical analyses were made by combined sieve and hydrometer methods *(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 soil.

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 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 maximum dry density.

Liquid limit and plasticity index indicate the effect of water on the strength and consistence of the soil material. As the moisture content of a clayey soil is increased from a dry state, the material changes from a semisolid to a plastic state.

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

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(15)*. 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 Psammaquents (*Psamm*, meaning sand texture, 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 Psammaquents.

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

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. There can be some variation in the texture of the surface layer or of the substratum within a series. The Pompano soils in DeSoto County are siliceous, hyperthermic Typic Psammaquents.

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 (14)*. Many of the technical terms used in the descriptions are defined in *Soil Taxonomy (15)*. 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."

Anclote Series

The Anclote series consists of deep, very poorly drained soils that formed in thick beds of sandy marine sediment. These soils are in depressions. Slopes are 0 to 1 percent. Anclote soils are sandy, siliceous, hyperthermic Typic Haplaquolls.

Anclote soils are associated on the landscape with Basinger, Floridana, and Valkaria soils. Basinger and Valkaria soils do not have a mollic epipedon. Floridana soils have a loamy argillic horizon between depths of 20 and 40 inches.

Typical pedon of Anclote mucky fine sand, depressional; about 800 feet east and 1,900 feet north of the southwest corner of sec. 3, T. 39 S., R. 26 E.

A1—0 to 10 inches; black (N 2/0) mucky fine sand; massive; very friable; many fine and very fine roots; neutral; clear smooth boundary.

A2—10 to 14 inches; black (10YR 2/1) fine sand; common medium distinct dark gray (10YR 4/1) mottles; weak medium granular structure; very friable; many fine roots; neutral; clear wavy boundary.

Cg1—14 to 35 inches; gray (10YR 6/1) fine sand; single grained; nonsticky and nonplastic; moderately alkaline; gradual wavy boundary.

Cg2—35 to 65 inches; grayish brown (10YR 5/2) fine sand; common medium distinct dark brown (10YR 4/3) mottles; single grained; nonsticky and nonplastic; moderately alkaline; gradual wavy boundary.

Cg3—65 to 80 inches; light brownish gray (10YR 6/2) fine sand; single grained; nonsticky and nonplastic; moderately alkaline.

Reaction ranges from 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. Gray mottles are in some pedons. This horizon is 11 to 22 inches thick. Texture is mucky fine sand, fine sand, or sand.

The Cg horizon has hue of 10YR, value of 3 to 7, and chroma of 1 or 2. Mottles in shades of brown or grayish brown are in some pedons. Texture is sand, fine sand, or loamy fine sand.

Basinger Series

The Basinger series consists of deep, poorly drained and very poorly drained soils that formed in thick beds of sandy marine sediment. These soils are in sloughs, on flood plains, and in depressions. Slopes are 0 to 2 percent. Basinger soils are siliceous, hyperthermic Spodic Psammaquents.

Basinger soils are associated on the landscape with Anclote, Smyrna, and Myakka soils. Anclote soils have a black surface layer that is more than 10 inches thick. Smyrna soils have a well developed spodic horizon within 20 inches of the surface. Myakka soils have a spodic horizon between depths of 20 and 30 inches.

Typical pedon of Basinger fine sand (fig. 12); in a slough about 400 feet west and 2,000 feet south of the northeast corner of sec. 22, T. 38 S., R. 27 E.

Ap—0 to 5 inches; dark gray (10YR 4/1) fine sand; salt-and-pepper appearance if unrubbed; single grained; loose; extremely acid; clear smooth boundary.

E—5 to 22 inches; light gray (10YR 7/1) fine sand; single grained; loose; very strongly acid; gradual wavy boundary.

E/Bh—22 to 30 inches; gray (10YR 6/1) fine sand; dark grayish brown (10YR 4/2) streaks; single grained; loose; very strongly acid; gradual wavy boundary.

Bh—30 to 54 inches; dark brown (10YR 4/3) fine sand; few very dark grayish brown (10YR 3/2) weakly cemented ortstein fragments ranging up to 1 inch in diameter; single grained; loose; strongly acid; clear wavy boundary.

C—54 to 80 inches; yellowish brown (10YR 5/4) fine sand; single grained; nonsticky and nonplastic; strongly acid.

Reaction ranges from extremely acid to neutral. Texture is sand or fine sand in all horizons except for the A horizon, which is fine sand.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. Combined thickness of the A and E horizons ranges from 19 to 38 inches.

The E/Bh horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2.

The Bh horizon has hue of 10YR, value of 4, and chroma of 2 to 4, or value of 5 and chroma of 3 or 4. In most pedons, this horizon has few to many weakly cemented ortstein fragments that have hue of 10YR, value of 3, and chroma of 2.

The C horizon has hue of 10YR, value of 5 or 6, and chroma of 2 to 4.

Bradenton Series

The Bradenton series consists of deep, poorly drained soils that formed in loamy and sandy marine

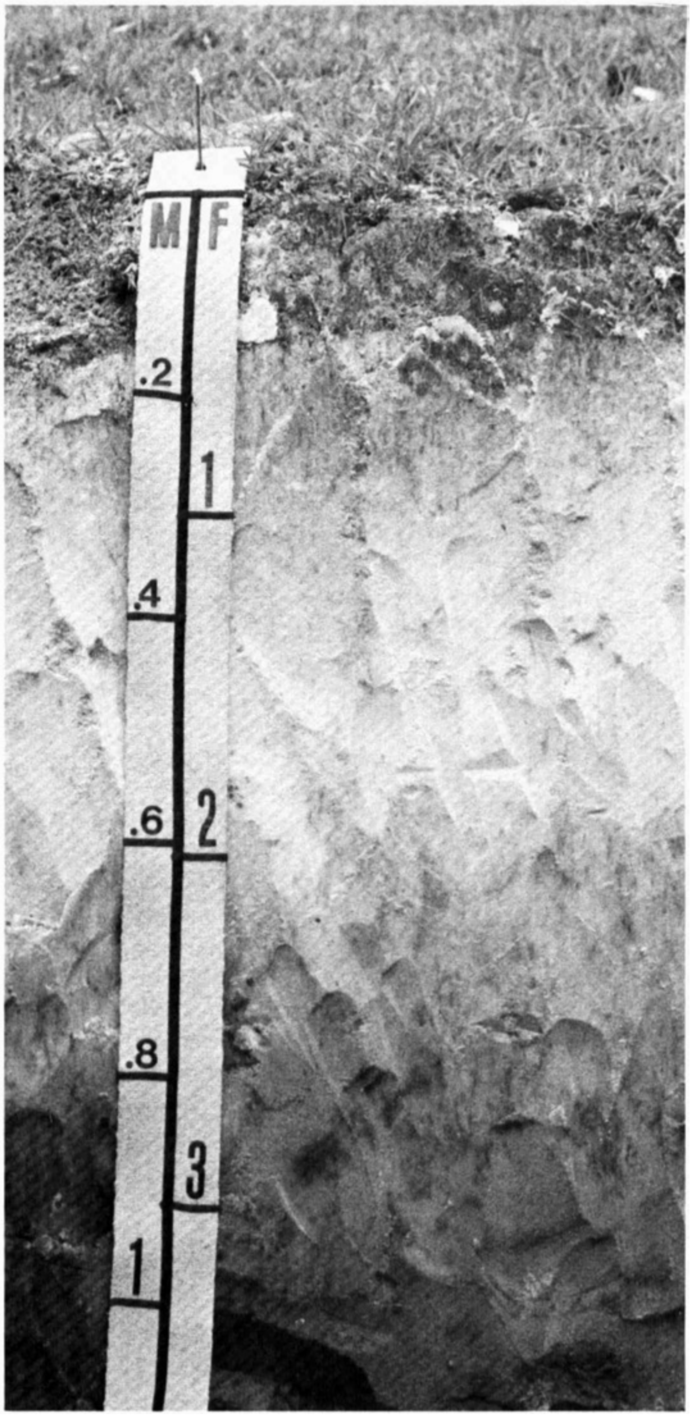

Figure 12.—Basinger fine sand has a slightly darkened subsoil at a depth of about 24 inches.

sediments. These soils are on low-lying hammocks and along the flood plain of the Peace River and major creeks. Slopes range from 0 to 2 percent. Bradenton soils are coarse-loamy, siliceous, hyperthermic Typic Ochraqualfs.

Bradenton soils are associated on the landscape with Felda, Pineda, Wabasso, Farmton, and Myakka soils. Felda and Pineda soils have a sandy A horizon that is 20 to 40 inches thick. Wabasso and Farmton soils have a spodic horizon that is underlain by a loamy argillic horizon. Myakka soils have a spodic horizon and are sandy to a depth of 80 inches or more.

Typical pedon of Bradenton fine sand; in a pasture about 2,200 feet west and 2,100 feet south of the northeast corner of sec. 29, T. 37 S., R. 26 E.

Ap—0 to 4 inches; dark gray (10YR 4/1) fine sand; weak fine granular structure; very friable; many fine roots; medium acid; clear smooth boundary.

E1—4 to 9 inches; gray (10YR 5/1) fine sand; single grained; loose; few fine roots; neutral; clear smooth boundary.

E2—9 to 15 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; few fine roots; mildly alkaline; gradual smooth boundary.

Btg—15 to 26 inches; light brownish gray (10YR 6/2) fine sandy loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; very friable; few fine roots; mildly alkaline; gradual smooth boundary.

Cg1—26 to 34 inches; gray (10YR 5/1) loamy fine sand; common medium prominent strong brown (7.5YR 5/8) mottles; weak fine subangular blocky structure; friable; few fine roots; mildly alkaline; gradual smooth boundary.

Cg2—34 to 58 inches; gray (10YR 5/1) loamy fine sand; pockets of fine sandy loam; many medium distinct light gray (10YR 7/1) mottles; weak fine subangular blocky structure; friable; few fine roots; neutral; gradual smooth boundary.

Cg3—58 to 80 inches; dark gray (5Y 4/1) and gray (5Y 5/1) loamy fine sand; pockets of sandy clay loam and sandy clay; weak fine subangular blocky structure; friable; moderately alkaline.

The solum ranges from 20 to 50 inches in thickness. Reaction ranges from medium acid to neutral in the A horizon, from strongly acid to mildly alkaline in the E horizon, from slightly acid to moderately alkaline in the Btg horizon, and from neutral to moderately alkaline in the Cg horizon.

The A or Ap horizon has hue of 10YR, value of 2 to 4, and chroma of 1.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2, or value of 4 and chroma of 2. Mottles in shades of brown, yellow, or gray are in some pedons. Combined thickness of the A and E horizons ranges from 10 to 17 inches. Texture of the E horizon is sand or fine sand.

The Btg horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2, or value of 7 and chroma of 2; hue of 7.5YR, value of 4 or 7, and chroma of 2; or hue of 5Y, value of 4 or 5, and chroma of 1. This horizon has mottles in shades of yellow or brown. Texture is loamy fine sand, fine sandy loam, or sandy loam.

The Cg horizon has hue of 10YR, 2.5Y, 5GY, or 5Y, value of 5 to 8, and chroma of 1 or 2, or hue of 5Y, value of 4, and chroma of 1. Mottles in shades of yellow, brown, or gray are in some pedons. Texture is fine sand, loamy fine sand, or fine sandy loam.

Cassia Series

The Cassia series consists of deep, somewhat poorly drained soils that formed in thick beds of sandy marine sediment. These soils are on flatwoods. Slopes range from 0 to 2 percent. Cassia soils are sandy, siliceous, hyperthermic Typic Haplohumods.

Cassia soils are associated on the landscape with Pomello, Smyrna, and Zolfo soils. Pomello soils have a spodic horizon between 30 and 50 inches of the surface. Smyrna soils are wetter than the Cassia soils and have a spodic horizon within 20 inches of the surface. Zolfo soils have a spodic horizon at a depth of more than 50 inches.

Typical pedon of Cassia fine sand; about 1,400 feet south and 1,300 feet west of the northeast corner of sec. 23, T. 36 S., R. 23 E.

A—0 to 3 inches; gray (10YR 5/1) fine sand; salt-and-pepper appearance if unrubbed; single grained; loose; few fine and medium roots; strongly acid; abrupt smooth boundary.

E—3 to 22 inches; gray (10YR 6/1) fine sand; single grained; loose; few fine and medium roots; strongly acid; abrupt smooth boundary.

Bh—22 to 28 inches; dark reddish brown (5YR 3/2) fine sand; weak fine subangular blocky structure; friable; very strongly acid; clear smooth boundary.

BE—28 to 40 inches; dark brown (10YR 4/3) fine sand; single grained; loose; very strongly acid; clear smooth boundary.

E'—40 to 55 inches; pale brown (10YR 6/3) fine sand; single grained; loose; very strongly acid; abrupt smooth boundary.

B'h1—55 to 59 inches; dark grayish brown (10YR 4/2) fine sand; single grained; loose; strongly acid; clear wavy boundary.

B'h2—59 to 80 inches; very dark grayish brown (10YR 3/2) fine sand; common medium black (10YR 2/1) ortstein fragments less than 1 inch in diameter; single grained; loose; strongly acid.

The solum ranges from 30 to 80 inches or more in thickness. Reaction ranges from very strongly acid to medium acid.

The A horizon has hue of 10YR, value of 5 or 6, and chroma of 1.

The E horizon has hue of 10YR, value of 6 or 7, and chroma of 1. Combined thickness of the A and E horizons ranges from 20 to 25 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 3, and chroma of 2. Texture is sand, fine sand, or loamy sand.

The BE horizon has hue of 10YR, value of 4, and chroma of 3 or 4. Texture is sand or fine sand. Some pedons do not have a BE horizon.

The E' horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or less. Texture is sand or fine sand. Some pedons do not have an E' horizon.

The B'h horizon has hue of 10YR, value of 4 or less, and chroma of 1 or 2. Ortstein fragments are in some pedons. Texture is sand, fine sand, or loamy sand.

Some pedons have a C horizon, which has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. Texture is sand or fine sand.

Chobee Series

The Chobee series consists of deep, very poorly drained soils that formed in thick beds of sandy and loamy marine sediments. These soils are in depressions and on flood plains of major rivers and creeks. Slopes are 0 to 1 percent. Chobee soils are fine-loamy, siliceous, hyperthermic Typic Argiaquolls.

Chobee soils are associated on the landscape with Felda, Floridana, Gator, Malabar, Farmton, Pineda, and Wabasso soils. Felda, Malabar, Farmton, Pineda, and Wabasso soils do not have a mollic epipedon, and they do not have an argillic horizon within 20 inches of the surface. Floridana soils also do not have an argillic horizon within 20 inches of the surface. Farmton and Wabasso soils have a spodic horizon. Gator soils are organic.

Typical pedon of Chobee muck, depressional; about 2,000 feet east and 700 feet north of the southwest corner of sec. 21, T. 37 S., R. 23 E.

Oa—0 to 2 inches; dark reddish brown (5YR 2.5/2) muck; about 30 percent unrubbed fiber, about 5 percent rubbed; moderate medium granular structure; very friable; many fine roots; medium acid; abrupt smooth boundary.

A—2 to 7 inches; black (10YR 2/1) sandy clay loam; common brown (10YR 5/3) sand streaks; moderate medium subangular blocky structure; firm; common fine roots; medium acid; gradual smooth boundary.

Bt—7 to 47 inches; black (N 2/0) sandy clay loam; moderate medium subangular blocky structure; firm; few thin discontinuous clay films; medium acid; gradual wavy boundary.

Btg—47 to 65 inches; grayish brown (10YR 5/2) fine sandy loam; common fine distinct dark yellowish brown (10YR 4/6) stains along root channels; moderate medium subangular blocky structure; firm; medium acid; abrupt smooth boundary.

Cg—65 to 80 inches; greenish gray (5GY 5/1) fine sand; massive; nonsticky and nonplastic; medium acid.

The solum ranges from 46 to more than 80 inches in thickness. Reaction ranges from strongly acid to neutral in the Oa horizon and from medium acid to mildly alkaline in the other horizons.

The Oa horizon has hue of 10YR, value of 2 or 3, and chroma of 1; has hue of 5YR, value of 2.5, and chroma of 1 or 2; or is neutral and has value of 2. This horizon is 2 to 6 inches thick. Some pedons do not have an Oa horizon.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1. This horizon is 5 to 18 inches thick. Texture is mucky loamy fine sand, loamy fine sand, fine sandy loam, sandy loam, or sandy clay loam.

The Bt horizon has hue of 10YR, value of 3 to 5, and chroma of 1; or it is neutral and has value of 2 or 3. Texture is sandy loam, fine sandy loam, or sandy clay loam.

The Btg horizon has hue of 10YR, value of 4 or 5, and chroma of 1 or 2; hue of 2.5Y, value of 5 or 6, and chroma of 2; or hue of 5Y, value of 5, and chroma of 1. The number of carbonate coatings or nodules ranges from none to many. Texture is sandy loam, fine sandy loam, or sandy clay loam.

Some pedons have a Btkg horizon, which has colors similar to those of the Btg horizon. The number of carbonate coatings on ped faces ranges from few to many.

The Cg horizon has hue of 10YR, value of 5, and chroma of 1; hue of 5GY, value of 5 or 6, and chroma of 1; or hue of 2.5Y, value of 6 or 7, and chroma of 2. Texture is fine sand, loamy sand, or sandy clay loam. Some pedons do not have a C horizon within a depth of 80 inches.

Delray Series

The Delray series consists of deep, very poorly drained soils that formed in sandy and loamy marine sediments. These soils are in depressions. Slopes are 0 to 1 percent. Delray soils are loamy, siliceous, hyperthermic Grossarenic Argiaquolls.

Delray soils are associated on the landscape with Anclote, EauGallie, Malabar, and Wabasso soils. Anclote soils do not have an argillic horizon. EauGallie, Malabar, and Wabasso soils do not have a mollic epipedon. EauGallie soils have a spodic horizon between 20 and 40 inches of the surface. Malabar soils have a Bw horizon. Wabasso soils have an argillic horizon within 40 inches of the surface.

Typical pedon of Delray mucky fine sand; depressional; about 1,400 feet west and 1,800 feet north of the southeast corner of sec. 26, T. 38 S., R. 27 E.

A—0 to 23 inches; black (10YR 2/1) mucky fine sand; weak fine granular structure; friable; many fine and medium roots; about 10 percent organic matter; neutral; gradual smooth boundary.

Eg1—23 to 53 inches; grayish brown (10YR 5/2) fine sand; single grained; nonsticky and nonplastic; neutral; gradual smooth boundary.

Eg2—53 to 65 inches; gray (10YR 6/1) fine sand; single grained; nonsticky and nonplastic; neutral; clear smooth boundary.

Btg1—65 to 70 inches; grayish brown (10YR 5/2) fine sandy loam; weak medium subangular blocky structure; slightly sticky and slightly plastic; neutral; gradual smooth boundary.

Btg2—70 to 75 inches; gray (10YR 6/1) fine sandy loam; weak medium subangular blocky structure; nonsticky and nonplastic; neutral; clear smooth boundary.

BC—75 to 80 inches; gray (5Y 6/1) loamy sand; massive; slightly sticky and slightly plastic; neutral.

Reaction is medium acid to neutral in the A horizon, slightly acid or neutral in the Eg horizon, and neutral to mildly alkaline in all other horizons.

The A horizon has hue of 10YR, value of 2, and chroma of 1; or it is neutral and has value of 2. This horizon is 12 to 24 inches thick.

The Eg horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2. Texture is sand or fine sand. Combined thickness of the A and E horizons ranges from 40 to 74 inches.

The Btg horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2; hue of 5Y, value of 5, and chroma of 1; or hue of 5GY, value of 5, and chroma of 1. Texture is sandy loam, fine sandy loam, or sandy clay loam.

The BC horizon has hue of 10YR, value of 4, and chroma of 2, or hue of 5Y, value of 6, and chroma of 1. Texture is loamy sand, loamy fine sand, or fine sandy loam.

Durbin Series

The Durbin series consists of deep, very poorly drained soils that formed in well decomposed herbaceous organic material. These soils are in tidal areas. Slopes are 0 to 1 percent. Durbin soils are euic, hyperthermic Typic Sulfihemists.

Durbin soils are associated on the landscape with Samsula, Terra Ceia, and Wulfert soils. Samsula and Terra Ceia soils are not tidal influenced. Wulfert soils have mineral layers at a depth of less than 51 inches.

Typical pedon of Durbin muck, in an area of Durbin and Wulfert mucks, frequently flooded; in a tidal marsh 350 feet east and 4,100 feet south of the northwest corner of sec. 26, T. 39 S., R. 23 E.

Oa1—0 to 4 inches; very dark brown (10YR 2/2) muck; about 25 percent unrubbed fiber, about 5 percent rubbed; massive; slightly sticky; common fine roots; estimated 0.7 percent sulfur; neutral; gradual smooth boundary.

Oa2—4 to 75 inches; black (10YR 2/1) muck; about 10 percent unrubbed fiber, about 3 percent rubbed; massive; slightly sticky; many fine and medium roots; estimated 2.5 percent sulfur; neutral; gradual wavy boundary.

C—75 to 80 inches; brown (10YR 5/3) sand; many coarse distinct very dark grayish brown (10YR 3/2) streaks; single grained; nonsticky and nonplastic; mildly alkaline.

Measured in 0.01 molar calcium chloride solution, reaction ranges from extremely acid to neutral in the Oa horizon and from extremely acid to moderately alkaline in the C horizon. After drying, reaction is one-half to one unit lower. At least part of the control section has a pH of 4.5 or higher.

The Oa horizon has hue of 10YR, value of 2, and chroma of 1 or 2; hue of 5YR or 7.5YR, value of 3, and chroma of 2; or hue of 5YR, value of 2, and chroma of 1. This horizon is 55 to 80 inches thick. Estimated sulfur content ranges from 0.7 to 3 percent.

The C horizon has hue of 10YR, value of 5, and chroma of 2 or 3. Streaks in shades of gray or brown are in some pedons. Texture is sand, fine sand, or loamy fine sand. Some pedons do not have a C horizon.

EauGallie Series

The EauGallie series consists of deep, poorly drained soils that formed in thick beds of sandy and loamy marine sediments. These soils are on flatwoods. Slopes range from 0 to 2 percent. EauGallie soils are sandy, siliceous, hyperthermic Alfic Haplaquods.

EauGallie soils are associated on the landscape with Farmton, Pineda, Immokalee, and Myakka soils. Farmton soils have a spodic horizon at a depth of more than 30 inches. Pineda soils have an argillic horizon between 20 and 40 inches of the surface. Immokalee and Myakka soils are sandy to a depth of more than 80 inches.

Typical pedon of EauGallie fine sand; about 1,200 feet east and 50 feet south of the northwest corner of sec. 21, T. 38 S., R. 23 E.

Ap—0 to 7 inches; very dark gray (10YR 3/1) fine sand; many uncoated sand grains; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; clear wavy boundary.

E1—7 to 14 inches; gray (10YR 5/1) fine sand; single grained; loose; common fine and medium roots; very strongly acid; clear wavy boundary.

E2—14 to 29 inches; light gray (10YR 7/1) fine sand; single grained; loose; few fine and medium roots; strongly acid; abrupt wavy boundary.

Bh1—29 to 32 inches; black (10YR 2/1) fine sand; weak medium subangular blocky structure; very friable; few fine roots; very strongly acid; clear wavy boundary.

Bh2—32 to 47 inches; dark brown (10YR 3/3) fine sand; very dark brown (10YR 2/2) stains along old root channels; weak medium subangular blocky structure; very friable; few fine roots; very strongly acid; gradual wavy boundary.

BE—47 to 68 inches; yellowish brown (10YR 5/4) fine sand; very dark grayish brown (10YR 3/2) stains along old root channels; single grained; nonsticky and nonplastic; very strongly acid; abrupt wavy boundary.

Btg1—68 to 75 inches; grayish brown (2.5Y 5/2) fine sandy loam; weak medium subangular blocky structure; friable; very strongly acid; clear wavy boundary.

Btg2—75 to 80 inches; light olive gray (5Y 6/2) sandy clay loam; weak medium subangular blocky structure; friable; very strongly acid.

The solum ranges from 48 to 80 inches or more in thickness. Reaction is very strongly acid to medium acid in the A and E horizons, very strongly acid to slightly acid in the Bh and BE horizons, and very strongly acid to mildly alkaline in the Btg horizon.

The A or Ap horizon has hue of 10YR, value of 2 to 4, and chroma of 1; or it is neutral and has value of 2.

The E horizon has hue of 10YR, value of 5 to 8, and chroma of 1.

The Bh horizon has hue of 5YR or 10YR, value of 2 or 3, and chroma of 1 to 3, or hue of 7.5YR, value of 3, and chroma of 2. Texture is sand or fine sand.

The BE horizon has hue of 10YR, value or 4 or 5, and chroma of 3 or 4. Texture is sand or fine sand. Some pedons do not have a BE horizon.

Some pedons have an E' horizon above the Btg horizon. This E' horizon has hue of 10YR, value of 5 to 7, and chroma of 1 to 3.

The Btg horizon has hue of 10YR, 2.5Y, or 5Y, value of 4 to 7, and chroma of 3 or less. The number of mottles in shades of brown, yellow, and gray ranges from none to many. 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 2 or 3.

Farmton Series

The Farmton series consists of deep, poorly drained soils that formed in thick beds of sandy and loamy marine sediments. These soils are on flatwoods. Slopes range from 0 to 2 percent. Farmton soils are sandy, siliceous, hyperthermic Arenic Ultic Haplaquods.

Farmton soils are associated on the landscape with Immokalee and EauGallie soils. Immokalee soils do not have an argillic horizon. EauGallie soils have a spodic horizon within 30 inches of the surface.

Typical pedon of Farmton fine sand; about 800 feet west and 1,800 feet north of the southeast corner of sec. 21, T. 38 S., R. 25 E.

A—0 to 4 inches; dark gray (10YR 4/1) fine sand; single grained; loose; very strongly acid; clear smooth boundary.

E1—4 to 14 inches; gray (10YR 5/1) fine sand; single grained; loose; very strongly acid; clear smooth boundary.

E2—14 to 34 inches; light gray (10YR 7/1) fine sand; single grained; loose; very strongly acid; clear smooth boundary.

Bh1—34 to 36 inches; black (10YR 2/1) fine sand; weak medium subangular blocky structure; friable; very strongly acid; clear smooth boundary.

Bh2—36 to 40 inches; very dark gray (10YR 3/1) fine sand; weak medium subangular blocky structure; friable; very strongly acid; clear smooth boundary.

Bh3—40 to 48 inches; dark brown (10YR 3/3) fine sand; massive; very friable; very strongly acid; abrupt smooth boundary.

Btg1—48 to 62 inches; light brownish gray (2.5Y 6/2) sandy clay loam; common fine distinct light olive brown (2.5Y 5/4) mottles; few intrusions of dark brown (10YR 3/3) in upper part of horizon; moderate medium subangular blocky structure; slightly sticky and slightly plastic; extremely acid; abrupt irregular boundary.

Btg2—62 to 80 inches; pale olive (5Y 6/3) sandy clay loam; moderate medium subangular blocky structure; slightly sticky and slightly plastic; very strongly acid.

The solum ranges from 60 to 80 inches in thickness. Reaction ranges from extremely acid to strongly acid.

The Ap or A horizon has hue of 10YR, value of 2 to 4, and chroma of 1.

The E horizon has hue of 10YR, value of 5 to 8, and chroma of 1, or value of 5 or 7 and chroma of 2. This horizon is 31 to 45 inches thick. Texture is sand or fine sand.

The Bh horizon has hue of 10YR, value of 2 to 4, and chroma of 1 to 3, or hue of 7.5YR, value of 3 or 4, and chroma of 2. Texture is sand, fine sand, or loamy fine sand.

The Bt horizon has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 1 or 2, or hue of 5Y, value of 6, and chroma of 3. It has very dark gray, dark brown, or light olive brown mottles or intrusions. Texture is fine sandy loam, sandy loam, or sandy clay loam.

Some pedons have a C horizon, which has hue of 10YR, value of 5 to 7, and chroma of 1 or 2.

Felda Series

The Felda series consists of deep, poorly drained and very poorly drained soils that formed in sandy and loamy marine sediments. These soils are in sloughs, on hammocks, in depressions, and on flood plains of major rivers and creeks. Slopes range from 0 to 2 percent. Felda soils are loamy, siliceous, hyperthermic Arenic Ochraqualfs.

Felda soils are associated on the landscape with Pineda and Wabasso soils. Pineda soils have a high-chroma Bw horizon within 30 inches of the surface. Wabasso soils have a spodic horizon.

Typical pedon of Felda fine sand; in a slough 2,300 feet south and 500 feet west of the northeast corner of sec. 29, T. 26 S., R. 25 E.

Ap—0 to 7 inches; black (10YR 2/1) fine sand; single grained; loose; many fine and very fine roots; slightly acid; clear smooth boundary.

Eg1—7 to 19 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; common fine and very fine roots; slightly acid; clear smooth boundary.

Eg2—19 to 29 inches; light gray (10YR 7/1) fine sand; many coarse prominent brownish yellow (10YR 6/6) mottles; single grained; loose; medium acid; clear wavy boundary.

Btg1—29 to 38 inches; gray (5Y 5/1) fine sandy loam; many fine prominent strong brown (7.5YR 5/6) and reddish yellow (7.5YR 6/8) mottles; moderate medium subangular blocky structure; slightly sticky and slightly plastic; neutral; clear smooth boundary.

Btg2—38 to 42 inches; gray (5Y 6/1) fine sandy loam; common fine prominent strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; slightly sticky and slightly plastic; neutral; clear wavy boundary.

Cg1—42 to 55 inches; gray (5Y 6/1) loamy sand; common medium distinct prominent yellowish brown (10YR 5/4, 5/6) mottles; massive; nonsticky and nonplastic; mildly alkaline; gradual wavy boundary.

Cg2—55 to 80 inches; light olive gray (5Y 6/2) loamy sand; common medium distinct olive (5Y 5/4) mottles; massive; nonsticky and nonplastic; mildly alkaline.

The solum ranges from 42 to more than 80 inches in thickness. Reaction is strongly acid to mildly alkaline in the A and E horizons, neutral or mildly alkaline in the Btg horizon, and slightly acid to moderately alkaline in the Cg horizon.

The A or Ap horizon has hue of 10YR, value of 2 to 4, and chroma of 1. This horizon is 3 to 8 inches thick.

The Eg horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2. It has common or many yellowish brown or brownish yellow mottles. Combined thickness of the A and E horizons ranges from 20 to 39 inches.

The Btg horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2; hue of 2.5Y, value of 5, and chroma of 2; or hue of 5Y, value of 5 or 6, and chroma of 1 or 2. The number of mottles in shades of yellow or brown ranges from none to many. Texture is sandy loam, fine sandy loam, or sandy clay loam.

The Cg horizon has hue of 10YR, 2.5Y, or 5Y, value of 5 to 7, and chroma of 1 or 2. The number of yellowish brown or olive mottles ranges from none to many. The number of shell fragments also ranges from none to many. Texture is sand, fine sand, or loamy sand.

Floridana Series

The Floridana series consists of deep, very poorly drained soils that formed in thick beds of sandy and loamy marine sediments. These soils are in depressions. Slopes are 0 to 1 percent. Floridana soils are loamy, siliceous, hyperthermic Arenic Argiaquolls.

Floridana soils are associated on the landscape with Malabar, Felda, and Pineda soils. Malabar, Felda, and Pineda soils do not have a mollic epipedon. In addition, Malabar soils do not have an argillic horizon within 40 inches of the surface.

Typical pedon of Floridana mucky fine sand, depressional; about 600 feet east and 1,500 feet south of the northwest corner of sec. 28, T. 36 S., R. 23 E.

A—0 to 22 inches; black (N 2/0) mucky fine sand; massive; nonsticky and nonplastic; many fine and very fine roots; slightly acid; clear smooth boundary.

Eg—22 to 34 inches; gray (10YR 6/1) fine sand; single grained; loose; slightly acid; clear smooth boundary.

Btg1—34 to 41 inches; gray (5Y 5/1) fine sandy loam; weak medium subangular blocky structure; slightly sticky and slightly plastic; slightly acid; gradual wavy boundary.

Btg2—41 to 45 inches; greenish gray (5GY 5/1) fine sandy loam; weak medium subangular blocky structure; slightly sticky and slightly plastic; slightly acid; gradual wavy boundary.

Cg—45 to 80 inches; gray (5Y 6/1) loamy fine sand; massive; nonsticky and nonplastic; slightly acid.

The solum ranges from 43 to 80 inches in thickness. Reaction ranges from very strongly acid to moderately alkaline.

The A horizon has hue of 10YR, value of 2, and chroma of 1; or it is neutral and has value of 2. Texture is fine sand or mucky fine sand.

The Eg horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. Combined thickness of the A and

E horizons ranges from 20 to 39 inches. Texture of the E horizon is sand or fine sand.

The Btg horizon has hue of 10YR, value of 4, and chroma of 1; hue of 10YR, 2.5Y, or 5Y, value of 5 or 6, and chroma of 1 or 2; or hue of 5GY, value of 5, and chroma of 1. Texture is sandy loam, fine sandy loam, or sandy clay loam.

The Cg horizon has hue of 5Y or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Texture is sand, loamy sand, or loamy fine sand.

Gator Series

The Gator series consists of deep, very poorly drained, organic soils that formed in beds of hydrophytic plant remains overlying beds of loamy and sandy marine deposits. These soils are in marshes, in swamps, and on flood plains. Slopes are less than 1 percent. Gator soils are loamy, siliceous, euic, hyperthermic Terric Medisaprists.

Gator soils are associated on the landscape with Felda, Floridana, and Terra Ceia soils. Felda and Floridana soils are mineral soils and have an argillic horizon. Floridana soils also have a mollic epipedon. Terra Ceia soils have organic material more than 51 inches thick.

Typical pedon of Gator muck, depressional; about 2,700 feet east and 1,700 feet north of the southwest corner of sec. 2, T. 39 S., R. 24 E.

Oa1—0 to 7 inches; black (N 2/0) sapric material (muck); about 20 percent fiber, less than 2 percent rubbed; weak fine granular structure; very friable; very strongly acid; clear wavy boundary.

Oa2—7 to 22 inches; black (10YR 2/1) sapric material (muck); about 10 percent fiber, less than 2 percent rubbed; weak fine granular structure; very friable; very strongly acid; gradual wavy boundary.

C1—22 to 30 inches; black (10YR 2/1) fine sandy loam; massive; slightly sticky and slightly plastic; neutral; gradual wavy boundary.

C2—30 to 40 inches; very dark grayish brown (10YR 3/2) fine sandy loam; common medium distinct black (10YR 2/1) mottles; massive; slightly sticky and slightly plastic; neutral; gradual wavy boundary.

Cg1—40 to 50 inches; dark grayish brown (10YR 4/2) fine sandy loam; pockets of sandy clay loam; massive; slightly sticky and slightly plastic; neutral; gradual wavy boundary.

Cg2—50 to 80 inches; dark gray (5Y 4/1) fine sandy loam; massive; slightly sticky and slightly plastic; many carbonate nodules in lower part; moderately alkaline.

Reaction ranges from slightly acid to mildly alkaline in the Oa horizon by the Hellige-Truog method and from extremely acid to very strongly acid in 0.01 molar calcium chloride. It ranges from slightly acid to moderately alkaline in the C horizon. At least part of the control section has pH of 4.5 or higher. The organic material ranges from 16 to 50 inches in thickness. In some pedons the organic material is underlain by a layer of fine sand or loamy fine sand, which is underlain by sandy clay loam. Some pedons also have thin layers of limnic material.

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 or 2; or is neutral and has value of 2. Rubbed fiber content is less than 15 percent.

The C horizon has hue of 10YR, value of 2 or 3, and chroma of 1; has hue of 2.5Y, value of 3, and chroma of 2; or is neutral and has value of 2. Texture is fine sandy loam, loam, or sandy clay loam.

The Cg horizon has hue of 10YR or 5Y, value of 4 to 6, and chroma of 1 or 2. Texture is fine sandy loam, loam, or sandy clay loam. The number of carbonate nodules ranges from none to many.

Immokalee Series

The Immokalee series consists of deep, poorly drained soils that formed in thick beds of sandy marine sediment. These soils are on flatwoods. Slopes range from 0 to 2 percent. Immokalee soils are sandy, siliceous, hyperthermic Arenic Haplaquods.

Immokalee soils are associated on the landscape with Myakka, Smyrna, and Farmton soils. Myakka soils have a spodic horizon within 30 inches of the surface, and Smyrna soils have a spodic horizon within 20 inches of the surface. Farmton soils have an argillic horizon below the spodic horizon.

Typical pedon of Immokalee fine sand; about 500 feet west and 2,000 feet south of the northeast corner of sec. 2, T. 38 S., R. 25 E.

A—0 to 5 inches; dark gray (10YR 4/1) fine sand; single grained; loose; many fine, medium, and coarse roots; extremely acid; clear smooth boundary.

E—5 to 43 inches; white (10YR 8/1) fine sand; single grained; loose; many fine, medium, and coarse roots; very strongly acid; abrupt smooth boundary.

Bh1—43 to 47 inches; black (10YR 2/1) fine sand;

moderate medium subangular blocky structure; friable; few fine roots; extremely acid; clear wavy boundary.

Bh2—47 to 55 inches; dark brown (7.5YR 3/2) fine sand; common medium distinct very dark brown (10YR 2/2) mottles and common black (10YR 2/1) ortstein fragments; moderate medium subangular blocky structure; friable; extremely acid; clear wavy boundary.

Bh3—55 to 65 inches; dark brown (7.5YR 3/2) loamy fine sand; massive; very friable; extremely acid; gradual wavy boundary.

C—65 to 80 inches; brown (7.5YR 5/4) fine sand; single grained; loose; extremely acid.

The solum ranges from 43 to 80 inches in thickness. Reaction ranges from extremely acid to medium acid.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1.

The E horizon has hue of 10YR, value or 6 to 8, and chroma of 1, or value of 6 and chroma of 2. Texture is sand or fine sand. Combined thickness of the A and E horizons ranges from 30 to 44 inches.

The Bh horizon has hue of 5YR, value of 3, and chroma of 1 to 3; hue of 7.5YR, value of 3, and chroma of 2; or hue of 10YR, value of 2 or 3, and chroma of 1 or 2. Texture is fine sand, sand, or loamy fine sand.

Some pedons have a BC horizon, which has hue of 10YR, value of 3, and chroma of 4; value of 4 and chroma of 3; or value of 5 and chroma of 3.

The C horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4; or hue of 7.5YR, value of 5, and chroma of 4. Texture is fine sand or sand. Some pedons do not have a C horizon.

Malabar Series

The Malabar series consists of deep, poorly drained and very poorly drained soils that formed in sandy and loamy marine sediments. These soils are on hammocks and flatwoods and in sloughs and depressions. Slopes range from 0 to 2 percent. Malabar soils are loamy, siliceous, hyperthermic Grossarenic Ochraqualfs.

Malabar soils are associated on the landscape with Farmton, Pineda, and Valkaria soils. Farmton soils have a spodic horizon. Pineda soils have a sandy subsurface layer tonguing into a loamy subsoil at a depth of less than 40 inches. Valkaria soils are sandy to a depth of 80 inches.

Typical pedon of Malabar fine sand; in a slough about 2,500 feet east and 1,700 feet south of the northwest corner of sec. 35, T. 38 S., R. 27 E.

A—0 to 6 inches; gray (10YR 5/1) fine sand; salt-and-pepper appearance if unrubbed; weak fine granular structure; very friable; common fine roots; very strongly acid; clear smooth boundary.

E—6 to 12 inches; yellowish brown (10YR 5/4) fine sand; common fine distinct yellowish brown (10YR 5/8) mottles; single grained; loose; few fine roots; strongly acid; gradual wavy boundary.

Bw1—12 to 23 inches; light yellowish brown (10YR 6/4) fine sand; few fine distinct yellowish brown (10YR 5/6) mottles; single grained; loose; strongly acid; clear smooth boundary.

Bw2—23 to 30 inches; yellowish brown (10YR 6/8) fine sand; single grained; nonsticky and nonplastic; strongly acid; clear smooth boundary.

Bw3—30 to 50 inches; light olive brown (2.5Y 5/4) fine sand; single grained; nonsticky and nonplastic; strongly acid; clear smooth boundary.

Btg—50 to 80 inches; gray (5Y 5/1) fine sandy loam; massive; slightly sticky and slightly plastic; strongly acid.

The solum ranges from 57 to 80 inches or more in thickness. Reaction ranges from strongly acid to moderately alkaline.

The A horizon has hue of 10YR, value of 2 to 5, and chroma of 1 or 2.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 2 to 4. Texture is sand or fine sand. Combined thickness of the A and E horizons ranges from 8 to 35 inches.

The Bw horizon has hue of 10YR, value of 5 or 7, and chroma of 4 to 8, or value of 6 and chroma of 3 to 8; or it has hue of 2.5Y, value of 5, and chroma of 4. Texture is sand or fine sand.

Some pedons have an E' horizon, which has hue of 10YR, value of 5 or 6, and chroma of 2 or 3. Texture is sand or fine sand.

The Btg horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2; hue of 2.5Y, value of 5 or 6, and chroma of 2; or hue of 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 BC horizon, which has hue of 10YR, value of 5 or 6, and chroma of 1.

Some pedons have a C horizon, which has hue of 10YR, value of 7, and chroma of 1 or 2; or hue of 5Y, value of 6, and chroma of 1. Texture is sand or fine sand.

Some pedons have a weakly expressed Bh horizon immediately above the Bw horizon.

Myakka Series

The Myakka series consists of deep, poorly drained soils that formed in thick beds of sandy marine sediment. These soils are on flatwoods. Slopes range from 0 to 2 percent. Myakka soils are sandy, siliceous, hyperthermic Aeric Haplaquods.

Myakka soils are associated on the landscape with Smyrna, Immokalee, Basinger, and Valkaria soils. Smyrna soils have a spodic horizon within 20 inches of the surface, and Immokalee soils have a spodic horizon at a depth of 30 to 50 inches. Basinger and Valkaria soils do not have a spodic horizon and are in lower positions on the landscape than the Myakka soils.

Typical pedon of Myakka fine sand; in a pasture about 1,700 feet west and 900 feet north of the southeast corner of sec. 21, T. 36 S., R. 25 E.

Ap—0 to 6 inches; dark gray (10YR 4/1) fine sand; single grained; loose; common very fine and fine roots; medium acid; clear smooth boundary.

E—6 to 22 inches; light gray (10YR 7/1) fine sand; single grained; loose; few fine roots; slightly acid; clear smooth boundary.

Bh1—22 to 25 inches; very dark brown (10YR 2/2) fine sand; weak fine subangular blocky structure; friable; very strongly acid; clear smooth boundary.

Bh2—25 to 28 inches; dark brown (7.5YR 3/2) fine sand; weak fine subangular blocky structure; friable; very strongly acid; clear wavy boundary.

BC—28 to 32 inches; dark brown (7.5YR 4/4) fine sand; single grained; nonsticky and nonplastic; very strongly acid; clear wavy boundary.

C1—32 to 38 inches; pale brown (10YR 6/3) fine sand; common fine distinct dark grayish brown (10YR 4/2) mottles; single grained; nonsticky and nonplastic; medium acid; gradual wavy boundary.

C2—38 to 60 inches; light gray (10YR 7/2) fine sand; common fine distinct brown (10YR 5/3) mottles; single grained; nonsticky and nonplastic; medium acid; gradual wavy boundary.

C3—60 to 80 inches; grayish brown (10YR 5/2) fine sand; common very dark grayish brown (10YR 3/2) streaks; single grained; nonsticky and nonplastic; medium acid.

The solum ranges from 30 to 80 inches in thickness. Reaction ranges from extremely acid to slightly acid.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 1, or value of 6 and chroma of 2. Combined thickness of the A and E horizons is 21 to 27 inches.

The Bh horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 to 3. Black, very dark brown, dark brown, or dark reddish brown spodic fragments and a few iron concretions are in some pedons. Texture is sand, fine sand, or loamy fine sand.

The BC horizon has hue of 10YR, value of 3, and chroma of 4, or value of 4 or 5 and chroma of 3; or it has hue of 7.5YR, value of 3 or 4, and chroma of 4. Streaks in hue of 10YR, value of 2, and chroma of 2, or a small amount of iron concretions are in some pedons.

Some pedons have an E' horizon, which has hue of 10YR, value of 5 or 6, and chroma of 1 or 2, or value of 6 and chroma of 4.

Some pedons have a B'h horizon, which has the same colors as those of the Bh horizon.

The C horizon has hue of 10YR, value of 4 to 7, and chroma of 2 to 4. Streaks or mottles in shades of brown or gray are in some pedons. Texture is sand or fine sand.

Ona Series

The Ona series consists of deep, poorly drained soils that formed in thick beds of sandy marine sediment. These soils are on flatwoods. Slopes range from 0 to 2 percent. Ona soils are sandy, siliceous, hyperthermic Typic Haplaquods.

Ona soils are associated on the landscape with Basinger, Immokalee, Myakka, and Smyrna soils. Basinger soils do not have a spodic horizon and are in lower positions on the landscape than the Ona soils. Immokalee soils have a spodic horizon at a depth of 30 to 50 inches, Myakka soils have a spodic horizon at a depth of 20 to 30 inches, and Smyrna soils have a spodic horizon within 20 inches of the surface.

Typical pedon of Ona fine sand; about 1,300 feet east and 2,300 feet north of the southwest corner of sec. 33, T. 36 S., R. 24 E.

Ap—0 to 5 inches; black (10YR 2/1) fine sand; weak fine granular structure; friable; many fine roots; strongly acid; clear smooth boundary.

Bh—5 to 20 inches; very dark brown (10YR 2/2) fine sand; few dark grayish brown (10YR 4/2) streaks; weak medium subangular blocky structure; friable; few fine roots; medium acid; gradual wavy boundary.

BE—20 to 31 inches; dark grayish brown (10YR 4/2) fine sand; common medium faint very dark gray (10YR 3/1) stains along old root channels; weak medium subangular blocky structure; friable; few fine roots; medium acid; gradual wavy boundary.

E—31 to 46 inches; pale brown (10YR 6/3) fine sand; single grained; loose; strongly acid; clear wavy boundary.

B'h—46 to 80 inches; black (5YR 2.5/1) fine sand; common coarse distinct black (10YR 2/1) stains; moderate medium subangular blocky structure; friable; strongly acid.

The solum ranges from 14 to 80 inches in thickness. Reaction ranges from extremely acid to medium acid. Texture is sand or fine sand in all horizons.

The A or Ap horizon has hue of 10YR, value of 2 or 3, and chroma of 1. This horizon is 5 to 9 inches thick.

The Bh horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2, or value of 3 and chroma of 2 or 3; hue of 7.5YR, value of 3, and chroma of 2; or hue of 5YR, value of 2, and chroma of 1. Brown or gray streaks are in some pedons.

The BE horizon has hue of 10YR, value of 4, and chroma of 2 to 4. Gray streaks or mottles are in some pedons. Some pedons do not have a BE horizon.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 2 or 3, or hue of 7.5YR, value of 5, and chroma of 2. Some pedons do not have an E horizon.

The B'h horizon has hue of 10YR, value of 2 or 3, and chroma of 2; hue of 7.5YR, value of 3 or 4, and chroma of 1 or 2; or hue of 5YR, value of 2 or 3, and chroma of 1 or 2. Black stains are in some pedons. Some pedons do not have a B'h horizon.

Pineda Series

The Pineda series consists of deep, poorly drained and very poorly drained soils that formed in thick beds of sandy and loamy marine sediments. These soils are in sloughs and depressions. Slopes range from 0 to 2 percent. Pineda soils are loamy, siliceous, hyperthermic Arenic Glossaqualfs.

Pineda soils are associated on the landscape with Valkaria, Malabar, Immokalee, and Felda soils. Valkaria soils are sandy to a depth of 80 inches. Malabar soils are sandy to a depth of more than 40 inches and are underlain by a loamy subsoil. Immokalee soils have a spodic horizon. Felda soils do not have a Bw horizon.

Typical pedon of Pineda fine sand; in a slough about 2,500 feet east and 100 feet north of the southwest corner of sec. 10, T. 39 S., R. 26 E.

Ap—0 to 3 inches; black (10YR 2/1) fine sand; single grained; loose; common fine and very fine roots; neutral; clear smooth boundary.

E1—3 to 8 inches; light brownish gray (10YR 6/2) fine sand; single grained; loose; few very fine roots; neutral; clear smooth boundary.

E2—8 to 15 inches; pale brown (10YR 6/3) fine sand; single grained; loose; neutral; clear smooth boundary.

Bw1—15 to 19 inches; yellowish brown (10YR 5/6) fine sand; single grained; loose; neutral; clear wavy boundary.

Bw2—19 to 28 inches; yellow (10YR 7/6) fine sand; common medium distinct brownish yellow (10YR 6/8) mottles; single grained; loose; neutral; abrupt irregular boundary.

Btg—28 to 41 inches; gray (5Y 6/1) fine sandy loam; many coarse prominent yellowish brown (10YR 5/8) mottles; common light gray (10YR 7/1) vertical sandy tongues; moderate medium subangular blocky structure; slightly sticky and slightly plastic; moderately alkaline; clear wavy boundary.

Cg1—41 to 52 inches; gray (5Y 6/1) loamy sand; common medium prominent yellowish brown (10YR 5/8) mottles and few fine distinct light olive brown (2.5Y 5/4) mottles; massive; nonsticky and nonplastic; moderately alkaline; clear smooth boundary.

Cg2—52 to 80 inches; light gray (10YR 7/2) fine sand; single grained; nonsticky and nonplastic; moderately alkaline.

The solum ranges from 41 to 80 inches in thickness. Reaction ranges from very strongly acid to neutral in the A, E, and Bw horizons, from strongly acid to moderately alkaline in the Btg horizon, and from medium acid to moderately alkaline in the Cg horizon.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 1 to 3. Texture is sand or fine sand. Combined thickness of the A and E horizons ranges from 15 to 27 inches.

The Bw horizon has hue of 10YR, value of 5 to 7, and chroma of 4 to 8. Yellow mottles are in some pedons. Texture is sand or fine sand.

The Btg horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2; hue of 2.5Y, value of 5 or 6, and chroma of 2; or hue of 5Y, value of 5 or 6, and chroma of 1. Vertical intrusions of gray sand and mottles of brown or yellow are in this horizon. Texture is sandy loam, fine sandy loam, or sandy clay loam.

The Cg horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2, or value of 5 and chroma of 2; or it has hue of 5Y, value of 6, and chroma of 1. Mottles in shades of brown or yellow are in this horizon. Texture is sand, fine sand, or loamy sand. Some pedons do not have a Cg horizon.

Pinellas Series

The Pinellas series consists of deep, poorly drained soils that formed in sandy marine sediment underlain by loamy sediment. These soils are on hammocks and low-lying flatwoods adjacent to sloughs and depressions. Slopes range from 0 to 2 percent. Pinellas soils are loamy, siliceous, hyperthermic Arenic Ochraqualfs.

Pinellas soils are associated on the landscape with Bradenton, EauGallie, Felda, Pineda, and Wabasso soils. Bradenton soils have an argillic horizon within 20 inches of the surface. EauGallie and Wabasso soils have a spodic horizon. Felda and Pineda soils do not have calcareous horizons.

Typical pedon of Pinellas fine sand, from an area of Pineda-Pinellas fine sands; in a cabbage palm hammock about 1,400 feet south and 1,450 feet west of the northeast corner of sec. 28, T. 38 S., R. 23 E.

A—0 to 4 inches; dark gray (10YR 4/1) fine sand; weak fine crumb structure; very friable; medium acid; clear smooth boundary.

E1—4 to 7 inches; light brownish gray (10YR 6/2) fine sand; single grained; loose; medium acid; clear wavy boundary.

E2—7 to 20 inches; grayish brown (10YR 5/2) fine sand; common medium distinct pale brown (10YR 6/3) and dark grayish brown (10YR 4/2) mottles; single grained; loose; medium acid; abrupt wavy boundary.

Bk—20 to 30 inches; light gray (10YR 7/1) fine sand; massive, crushes to weak crumb structure; firm in place, friable; secondary carbonates in interstices between sand grains; sand grains thinly coated with carbonates; strongly alkaline, calcareous; abrupt wavy boundary.

Btkg—30 to 42 inches; light gray (10YR 7/2) fine sandy loam; common medium faint light greenish gray (5GY 7/1) mottles and common medium prominent brownish yellow (10YR 6/8) mottles; weak medium subangular blocky structure; friable; sand grains bridged and coated with clay; many fine and medium calcium carbonate concretions; strongly alkaline, calcareous; clear wavy boundary.

C—42 to 50 inches; very pale brown (10YR 7/3) fine sand; many coarse prominent yellowish brown (10YR 5/8) mottles; single grained; loose; moderately alkaline; gradual wavy boundary.

Cg—50 to 80 inches; light greenish gray (5GY 7/1) fine sand; common medium prominent yellowish brown (10YR 5/8) mottles; single grained; loose; about 5 percent, by volume, iron-cemented sandstone coated with calcium carbonate; moderately alkaline.

The solum ranges from 40 to 60 inches in thickness. Reaction ranges from medium acid to mildly alkaline in the A and E horizons, from neutral to strongly alkaline in the B horizon, and is moderately alkaline in the C horizon.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1.

The E horizon has hue of 10YR, value of 4 to 6, and chroma of 2 or 3. It has mottles in shades of yellow or brown. Combined thickness of the A and E horizons ranges from 8 to 30 inches.

The Bk horizon has hue of 10YR, value of 5 to 8, and chroma of 2, or value of 7 or 8 and chroma of 1. Mottles in shades of yellow and brown are in some pedons. Texture is sand or fine sand.

The Btkg horizon has hue of 10YR, value of 6 to 8, and chroma of 1 or 2. It has mottles in shades of yellow or gray. Secondary carbonates range from common to many. Iron cemented sandstone coated with calcium carbonates ranges up to 5 percent, by volume. Shell fragments range from none to many. Some pedons do not have secondary accumulations of carbonates in the Bt horizon.

The C horizon has hue of 10YR or 5GY, value of 7, and chroma of 1; hue of 10YR, value of 7, and chroma of 3; or hue of 5Y, value of 6, and chroma of 1. It has mottles in shades of yellow or brown. Shell fragments range from none to many. Texture is sand or fine sand.

Some pedons have a Bw horizon above the Bk horizon. The Bw horizon has hue of 10YR, value of 4, and chroma of 2, or hue of 10YR, value of 6, and chroma of 4.

Pomello Series

The Pomello series consists of deep, moderately well drained soils that formed in thick deposits of marine sands. These soils are on low ridges on flatwoods. Slopes range from 0 to 2 percent. Pomello soils are sandy, siliceous, hyperthermic Arenic Haplohumods.

Pomello soils are associated on the landscape with Immokalee and Punta soils. Immokalee and Punta soils have a higher water table than that of the Pomello soils. Punta soils have a spodic horizon at a depth of more than 51 inches.

Typical pedon of Pomello fine sand; about 2,000 feet east and 1,900 feet north of the southwest corner of sec. 16, T. 38 S., R. 27 E.

Ap—0 to 6 inches; gray (10YR 5/1) fine sand; single grained; loose; many fine and medium roots; very strongly acid; clear smooth boundary.

E—6 to 46 inches; white (10YR 8/1) fine sand; single grained; loose; many fine and medium roots; very strongly acid; abrupt wavy boundary.

Bh1—46 to 48 inches; black (10YR 2/1) fine sand; moderate medium subangular blocky structure; friable; many fine and medium roots; very strongly acid; clear wavy boundary.

Bh2—48 to 52 inches; dark reddish brown (5YR 2/2) fine sand; moderate medium subangular blocky structure; friable; common fine and medium roots; very strongly acid; clear wavy boundary.

BC1—52 to 59 inches; dark brown (7.5YR 4/4) fine sand; single grained; loose; few fine roots; very strongly acid; clear smooth boundary.

BC2—59 to 66 inches; dark yellowish brown (10YR 4/4) fine sand; single grained; loose; few fine roots; very strongly acid; clear smooth boundary.

C—66 to 80 inches; light yellowish brown (10YR 6/4) fine sand; single grained; loose; very strongly acid.

The solum ranges from 56 to 80 inches in thickness. Reaction ranges from very strongly acid to medium acid. Texture is coarse sand, sand, or fine sand in all horizons except the A horizon, which is fine sand.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 1.

The E horizon has hue of 10YR, value of 6 to 8, and chroma of 1. Combined thickness of the Ap and E horizons ranges from 33 to 48 inches.

The Bh horizon has hue of 10YR, value of 2, and chroma of 1 or 2; hue of 5YR, value of 2, and chroma of 2; or hue of 7.5YR, value of 3, and chroma of 2.

The BC horizon has hue of 10YR, value of 3, and chroma of 3, or value of 4 and chroma of 2 to 4; or it has hue of 7.5YR, value of 3 or 4, and chroma of 4.

The C horizon has hue of 10YR, value of 6, and chroma of 2 to 4. Some pedons do not have a C horizon within 80 inches of the surface.

Pompano Series

The Pompano series consists of deep, poorly drained soils that formed in thick beds of sandy marine sediment. These soils are in sloughs. Slopes are 0 to 1 percent. Pompano soils are siliceous, hyperthermic Typic Psammaquents.

Pompano soils are associated on the landscape with Basinger, Myakka, Anclote, and Smyrna soils. Basinger soils have a Bh horizon. Myakka soils have a spodic horizon between depths of 20 and 30 inches. Anclote soils have a mollic epipedon. Smyrna soils have a spodic horizon within 10 to 20 inches of the surface.

Typical pedon of Pompano fine sand; about 700 feet east and 1,400 north of the southwest corner of sec. 27, T. 38 S., R. 27 E.

A—0 to 5 inches; very dark gray (10YR 3/1) fine sand; weak fine granular structure; very friable; common fine roots; very strongly acid; clear wavy boundary.

Cg1—5 to 12 inches; gray (10YR 5/1) fine sand; single grained; loose; common fine roots; very strongly acid; clear wavy boundary.

Cg2—12 to 29 inches; light brownish gray (10YR 6/2) fine sand; single grained; loose; few fine roots; medium acid; clear wavy boundary.

Cg3—29 to 61 inches; grayish brown (10YR 5/2) fine sand; single grained; nonsticky and nonplastic; strongly acid; clear wavy boundary.

Cg4—61 to 80 inches; white (10YR 8/1) fine sand; single grained; nonsticky and nonplastic; medium acid.

Reaction ranges from 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. This horizon is 3 to 5 inches thick.

The Cg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2, or value of 8 and chroma of 1. Mottles in shades of yellow or brown are in some pedons. Texture is sand or fine sand.

Punta Series

The Punta series consists of deep, poorly drained soils that formed in thick beds of marine sands. These soils are on flatwoods. Slopes range from 0 to 2 percent. Punta soils are sandy, siliceous, hyperthermic Grossarenic Haplaquods.

Punta soils are associated on the landscape with Immokalee, Myakka, and Smyrna soils. Immokalee soils have a spodic horizon between depths of 30 and 50 inches, Myakka soils have a spodic horizon between depths of 20 and 30 inches, and Smyrna soils have a spodic horizon within a depth of 20 inches.

Typical pedon of Punta fine sand; about 0.5 mile east and 700 feet north of the southwest corner of sec. 35, T. 36 S., R. 23 E.

Ap—0 to 3 inches; gray (10YR 5/1) fine sand; single grained; loose; many fine and very fine roots; medium acid; clear smooth boundary.

E1—3 to 24 inches; light gray (10YR 7/1) fine sand; single grained; loose; few fine and very fine roots; medium acid; clear smooth boundary.

E2—24 to 60 inches; white (10YR 8/1) fine sand; single grained; loose; medium acid; clear wavy boundary.

Bh1—60 to 68 inches; black (10YR 2/1) fine sand; massive; nonsticky and nonplastic; very strongly acid; clear wavy boundary.

Bh2—68 to 80 inches; very dark brown (10YR 2/2) fine sand; massive; nonsticky and nonplastic; very strongly acid.

Reaction ranges from very strongly acid to medium acid in the A and E horizons and from extremely acid to strongly acid in the Bh horizon. Texture is sand or fine sand in all horizons.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1.

The E horizon has hue of 10YR, value of 6 to 8, and chroma of 1. Brown or gray mottles are in some pedons. Combined thickness of the A and E horizons ranges from 55 to 67 inches.

The Bh horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2.

Some pedons have a C horizon, which has hue of 10YR, value of 6, and chroma of 3 or 4.

Samsula Series

The Samsula series consists of deep, very poorly drained, organic soils that formed in beds of hydrophytic plant remains underlain by beds of sandy marine deposits. These soils are in depressions, in swamps, and on flood plains. Slopes are less than 1 percent. Samsula soils are sandy or sandy-skeletal, siliceous, dysic, hyperthermic Terric Medisaprists.

Samsula soils are associated on the landscape with Anclote and Terra Ceia soils. Anclote soils are a mineral soil and have a mollic epipedon. Terra Ceia soils have organic material more than 51 inches thick.

Typical pedon of Samsula muck, depressional; 2,300 feet south and 800 feet east of the northwest corner of sec. 22, T. 38 S., R. 27 E.

Oa1—0 to 13 inches; black (N 2/0) sapric material (muck); about 12 percent fiber, about 2 percent rubbed; weak coarse subangular blocky structure; friable; few krotovena; extremely acid; clear smooth boundary.

Oa2—13 to 19 inches; dark reddish brown (5YR 3/2) sapric material (muck); about 50 percent fiber, about 4 percent rubbed; weak coarse subangular blocky structure; friable; several burn layers; extremely acid; clear wavy boundary.

C—19 to 23 inches; black (10YR 2/1) fine sand; single grained; nonsticky and nonplastic; few krotovinas; extremely acid; clear wavy boundary.

Cg—23 to 80 inches; light gray (10YR 7/2) sand; single grained; nonsticky and nonplastic; very strongly acid.

Reaction ranges from extremely acid to strongly acid. The organic material ranges from 16 to 50 inches in thickness.

The Oa horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2; hue of 5YR, value of 3, and chroma of 2; or it is neutral and has value of 2. Rubbed fiber content is less than 16 percent.

The C horizon has hue of 10YR, value of 2, and chroma of 1, or value of 3 or 4 and chroma of 1 or 2. The texture is fine sand, sand, or loamy sand.

The Cg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. Streaks or mottles of lighter or darker colors are in some pedons. Texture is fine sand or sand.

Satellite Series

The Satellite series consists of deep, somewhat poorly drained soils that formed in thick beds of sandy marine sediment. These soils are on low knolls and ridges on flatwoods. Slopes range from 0 to 2 percent. Satellite soils are hyperthermic, uncoated Aquic Quartzipsamments.

Satellite soils are associated on the landscape with Punta, Tavares, and Zolfo soils. Punta and Zolfo soils have a spodic horizon at a depth of more than 50 inches. Punta soils are more poorly drained than the Satellite soils, and Tavares soils are better drained.

Typical pedon of Satellite fine sand; on a knoll off Lily Grade Road, about 2,600 feet east and 1,000 feet south of the northwest corner of sec. 30, T. 36 S., R. 25 E.

A—0 to 4 inches; gray (10YR 5/1) fine sand; salt-and-pepper appearance if unrubbed; single grained; loose; few fine, common medium, and many coarse roots; very strongly acid; clear smooth boundary.

C—4 to 80 inches; white (10YR 8/1) fine sand; dark gray (10YR 4/1) stains along root channels in the upper 6 inches of the horizon; single grained; loose; many fine and medium roots in the upper part, few fine and medium roots in the lower part; strongly acid.

Reaction ranges from very strongly acid to mildly alkaline.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 1 or 2. This horizon is 3 to 6 inches thick.

The C horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2, or value of 8 and chroma of 1. Low chroma in the upper part of the C horizon is because of the color of the uncoated sand grains and not because of wetness. Streaks in shades of brown or gray are along old root channels in some pedons. Grayish brown mottles are in some pedons. Texture is coarse sand, sand, or fine sand.

Smyrna Series

The Smyrna series consists of deep, poorly drained soils that formed in thick beds of sandy marine sediment. These soils are on flatwoods. Slopes range from 0 to 2 percent. Smyrna soils are sandy, siliceous, hyperthermic Aeric Haplaquods.

Smyrna soils are associated on the landscape with Myakka, Immokalee, Basinger, and Valkaria soils. Myakka soils have a spodic horizon between depths of 20 and 30 inches. Immokalee soils have a spodic horizon between depths of 30 and 50 inches. Basinger and Valkaria soils do not have a spodic horizon and are in lower positions on the landscape than the Smyrna soils.

Typical pedon of Smyrna fine sand (fig. 13); about 2,500 feet east and 100 feet south of the northwest corner of sec. 33, T. 37 S., R. 26 E.

Ap—0 to 6 inches; dark gray (10YR 4/1) fine sand; salt-and-pepper appearance if unrubbed; single grained; loose; many fine roots; strongly acid; abrupt smooth boundary.

E—6 to 12 inches; gray (10YR 6/1) fine sand; many uncoated sand grains; single grained; loose; common fine roots; neutral; abrupt wavy boundary.

Bh—12 to 15 inches; dark reddish brown (5YR 2/2) fine sand; weak fine subangular blocky structure; very friable; common fine roots; strongly acid; clear wavy boundary.

BE—15 to 19 inches; dark yellowish brown (10YR 4/6) fine sand; single grained; loose; few fine roots; strongly acid; clear wavy boundary.

E'—19 to 37 inches; light yellowish brown (10YR 6/4) fine sand; few fine distinct dark yellowish brown (10YR 3/4) mottles; single grained; loose; few fine roots; slightly acid; gradual wavy boundary.

B'h1—37 to 57 inches; very dark grayish brown (10YR 3/2) fine sand; few black (10YR 2/1) ortstein fragments less than 1 inch in diameter; single grained; loose; few fine roots; slightly acid; clear wavy boundary.

B'h2—57 to 74 inches; dark reddish brown (5YR 3/2) fine sand; few black (5YR 2.5/1) bodies; moderate medium subangular blocky structure; friable; few fine roots; medium acid; clear wavy boundary.

B'h3—74 to 80 inches; dark reddish brown (5YR 3/3) fine sand; few dark reddish brown (5YR 3/2) bodies; single grained; loose; medium acid.

The solum ranges from 14 to 80 inches or more in thickness. Reaction ranges from extremely acid to neutral.

The A or Ap horizon has hue of 10YR, value of 2 to 4, and chroma of 1.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 1. Combined thickness of the A and E horizons is less than 20 inches.

The Bh horizon has hue of 5YR, value of 2, and chroma of 2, or value of 3 and chroma of 3; hue of 7.5YR, value of 3, and chroma of 2; or hue of 10YR, value of 2 or 3, and chroma of 1 or 2, or value of 3 and chroma of 3. Gray tongues or streaks in shades of gray, yellow, or brown are in some pedons. Texture is sand, fine sand, or loamy fine sand.

The BE horizon has hue of 10YR, value of 4, and chroma of 2 to 6. Gray or brown streaks are in some pedons. Texture is sand or fine sand.

The E' horizon has hue of 10YR, value of 7, and chroma of 3 or 4, value of 6 and chroma of 1 to 4, or value of 5 and chroma of 2 or 3. Mottles in shades of brown or yellow are in some pedons, and some pedons also have black streaks. Texture is sand or fine sand.

The B'h horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2, or value of 4 and chroma of 2 to 4; hue of 7.5YR, value of 3, and chroma of 2 to 4, or value of 3 and chroma of 2; or hue of 5YR, value of 3, and chroma of 2 or 3. Black ortstein fragments or fragments in shades of brown are in some pedons. Texture is sand, fine sand, or loamy fine sand.

Tavares Series

The Tavares series consists of deep, moderately well drained soils that formed in thick beds of sandy marine sediment. These soils are on upland ridges. Slopes range from 0 to 5 percent. Tavares soils are hyperthermic, uncoated Typic Quartzipsamments.

Tavares soils are associated on the landscape with Zolfo and Immokalee soils. Zolfo soils are in slightly lower positions on the landscape than the Tavares soils

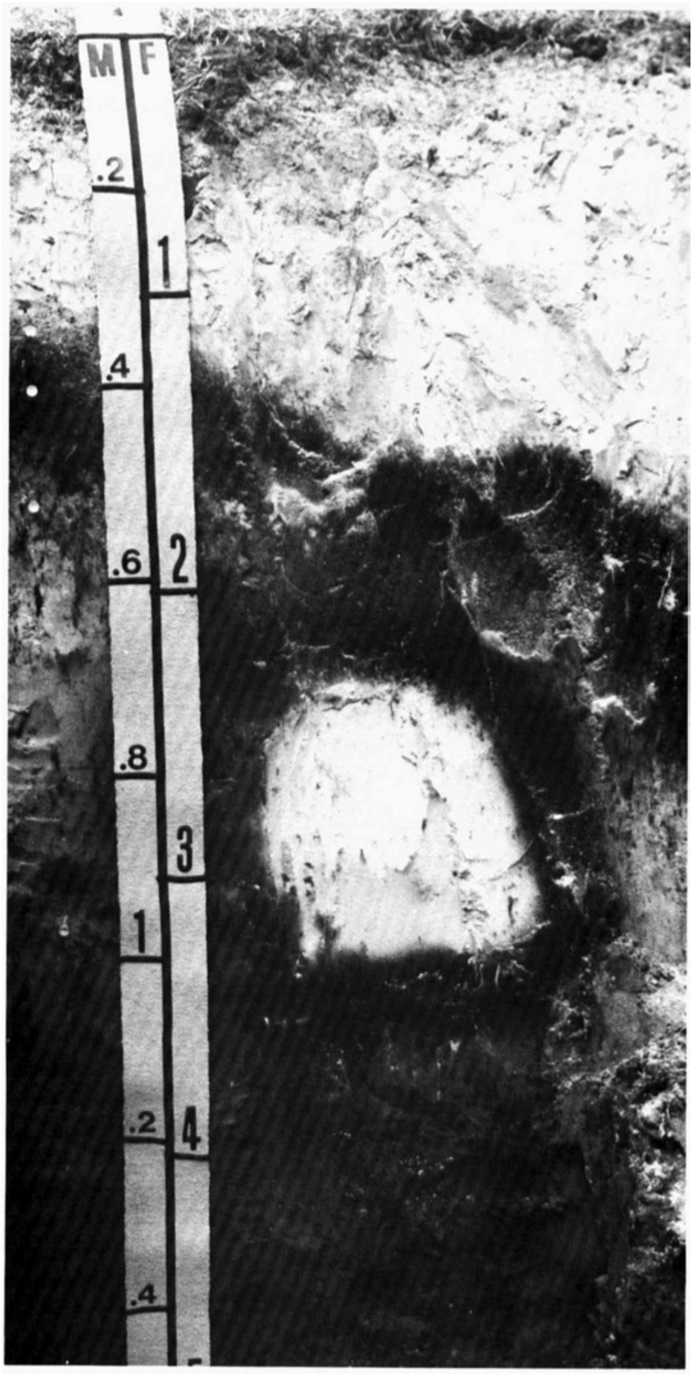

Figure 13.—Smyrna fine sand has a dark colored subsoil at a depth of about 14 inches. The white pocket at a depth of about 36 inches is lighter colored material that was transported down decayed root channels.

and have a spodic horizon at a depth of more than 50 inches. Immokalee soils have a well developed spodic horizon at a depth of 30 to 50 inches.

Typical pedon of Tavares fine sand, 0 to 5 percent slopes; about 1,100 feet south and 400 feet west of the northeast corner of sec. 19, T. 38 S., R. 24 E.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) fine sand; single grained; loose; many fine roots; slightly acid; clear smooth boundary.

C1—6 to 11 inches; light yellowish brown (10YR 6/4) fine sand; single grained; loose; few fine roots; neutral; clear smooth boundary.

C2—11 to 36 inches; very pale brown (10YR 7/3) fine sand; single grained; loose; medium acid; clear smooth boundary.

C3—36 to 54 inches; very pale brown (10YR 8/3) fine sand; few fine faint brownish yellow (10YR 6/6) mottles; single grained; loose; medium acid; clear smooth boundary.

C4—54 to 80 inches; white (10YR 8/1) fine sand; common medium prominent brownish yellow (10YR 6/6, 6/8) mottles; few yellowish brown (10YR 5/4) streaks; single grained; loose; medium acid.

Reaction ranges from very strongly acid to slightly acid except where lime has been added to the soil.

The A or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 1 or 2. This horizon is 5 to 7 inches thick.

The upper part of the C horizon has hue of 10YR, value of 6 or 7, and chroma 3 or 4. The lower part has hue of 10YR, value of 6, and chroma of 2, value of 7 and chroma of 2 to 4, or value of 8 and chroma of 1 to 3. It has mottles and streaks in shades of yellow or brown. Texture is sand or fine sand.

Terra Ceia Series

The Terra Ceia series consists of deep, very poorly drained, organic soils that formed in beds of hydrophytic plant remains. These soils are in swamps, in depressions, and on flood plains. Slopes are less than 1 percent. Terra Ceia soils are euic, hyperthermic Typic Medisaprists.

Terra Ceia soils are associated on the landscape with Gator, Myakka, Samsula, and Anclote soils. Gator soils formed in organic material underlain by loamy material. Myakka soils are mineral soils and have a spodic horizon. Samsula soils formed in organic material underlain by sandy material, and Anclote soils are mineral soils and have a mollic epipedon.

Typical pedon of Terra Ceia muck, depressional; in a marsh about 3,000 feet south and 600 feet east of the northwest corner of sec. 32, T. 39 S., R. 27 E.

Oa1—0 to 10 inches; black (N 2/0) sapric material (muck); about 30 percent unrubbed fiber, about 6 percent rubbed; weak fine granular structure; very friable; medium acid; clear wavy boundary.

Oa2—10 to 58 inches; dark reddish brown (5YR 3/2) sapric material (muck); about 65 percent unrubbed fiber, about 15 percent rubbed; weak medium granular structure; very friable; medium acid; clear wavy boundary.

Cg1—58 to 70 inches; dark gray (10YR 4/1) loamy sand; massive; nonsticky and nonplastic; moderately alkaline; abrupt wavy boundary.

Cg2—70 to 80 inches; light brownish gray (2.5Y 6/2) sandy clay; common fine distinct olive brown (2.5Y 4/4) mottles; massive; sticky and plastic; moderately alkaline.

Reaction ranges from very strongly acid to moderately alkaline in the organic layers and is moderately alkaline in the mineral layers. The organic material ranges from 52 to more than 80 inches in thickness.

The Oa1 horizon has hue of 10YR, value of 2, and chroma of 1; or it is neutral and has value of 2. The Oa2 horizon has hue of 5YR, value of 2, and chroma of 1 or 2, or value of 3 and chroma of 2; or it is neutral and has value of 2. Unrubbed fiber content ranges from about 5 to 30 percent of the organic volume. Rubbed fiber content is less than 16 percent.

The Cg horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2; hue of 2.5Y, value of 6, and chroma of 2; or hue of 5Y, value of 5, and chroma of 1. Mottles in shades of olive or brown are in some pedons. Texture is sand, loamy sand, sandy loam, sandy clay loam, or sandy clay.

Valkaria Series

The Valkaria series consists of deep, poorly drained soils that formed in thick beds of sandy marine sediment. These soils are in sloughs. Slopes are 0 to 1 percent. Valkaria soils are siliceous, hyperthermic Spodic Psammaquents.

Valkaria soils are associated on the landscape with Myakka, Immokalee, Basinger, and Malabar soils. Myakka and Immokalee soils have a well developed spodic horizon. Basinger soils have a weakly developed Bh horizon. Malabar soils have an argillic horizon at a depth of more than 40 inches.

Typical pedon of Valkaria fine sand; in a slough about 2,000 feet east and 1,400 feet south of the northwest corner of sec. 15, T. 38 S., R. 27 E.

Ap—0 to 6 inches; dark gray (10YR 4/1) fine sand; salt-and-pepper appearance if unrubbed; single grained; loose; common fine roots; very strongly acid; clear wavy boundary.

E1—6 to 20 inches; gray (10YR 5/1) fine sand; single grained; loose; few fine roots; strongly acid; gradual wavy boundary.

E2—20 to 25 inches; pale brown (10YR 6/3) fine sand; common medium brownish yellow (10YR 6/8) mottles; single grained; loose; medium acid; clear wavy boundary.

Bw—25 to 31 inches; brownish yellow (10YR 6/8) fine sand; single grained; loose; very strongly acid; few iron-cemented sandstone fragments; clear wavy boundary.

C1—31 to 68 inches; light gray (10YR 7/2) fine sand; single grained; loose; strongly acid; clear wavy boundary.

C2—68 to 80 inches; grayish brown (10YR 5/2) fine sand; single grained; nonsticky and nonplastic; very strongly acid.

Reaction ranges from strongly acid to neutral in the A, E, and Bw horizons and from very strongly acid to moderately alkaline in the C horizon. Texture is sand or fine sand in all horizons except for the A horizon, which is fine sand.

The A or Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 1.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 1 to 3. Mottles in shades of brown or yellow are in some pedons. Combined thickness of the A and E horizons ranges from 10 to 25 inches.

The Bw horizon has hue of 10YR, value of 5 to 7, and chroma of 4 to 8. Mottles in shades of brown or yellow are in some pedons. Less than 5 percent, by volume, iron-cemented sandstone is in some pedons.

The C horizon has hue of 10YR, value of 5 to 7, and chroma of 1 to 3, or hue of 2.5Y, value of 6, and chroma of 2.

Wabasso Series

The Wabasso series consists of deep, poorly drained soils that formed in sandy and loamy sediments. These soils are on flatwoods. Slopes range from 0 to 2 percent. Wabasso soils are sandy, siliceous, hyperthermic Alfic Haplaquods.

Wabasso soils are associated on the landscape with

Myakka, EauGallie, Felda, and Bradenton soils. Myakka soils do not have an argillic horizon. EauGallie soils have a loamy subsoil below a depth of 40 inches. Felda and Bradenton soils do not have a spodic horizon.

Typical pedon of Wabasso fine sand; about 2,700 feet east and 700 feet north of the southwest corner of sec. 21, T. 37 S., R. 23 E.

A—0 to 7 inches; dark gray (10YR 4/1) sand; single grained; loose; many fine and medium roots; very strongly acid; gradual smooth boundary.

E1—7 to 14 inches; gray (10YR 5/1) fine sand; many uncoated sand grains; single grained; loose; common medium roots; very strongly acid; gradual smooth boundary.

E2—14 to 21 inches; light gray (10YR 6/1) fine sand; single grained; loose; common fine roots; very strongly acid; gradual smooth boundary.

E3—21 to 26 inches; light gray (10YR 7/1) fine sand; single grained; loose; common medium roots; strongly acid; gradual wavy boundary.

Bh—26 to 31 inches; black (10YR 2/1) fine sand; weak fine subangular blocky structure; very friable; few fine and medium roots; very strongly acid; gradual wavy boundary.

Bt—31 to 37 inches; brown (10YR 5/3) fine sandy loam; many medium distinct yellowish brown (10YR 5/8) mottles; weak fine subangular blocky structure; friable; few medium roots; strongly acid; gradual smooth boundary.

Btg1—37 to 55 inches; grayish brown (10YR 5/2) fine sandy loam; many medium and coarse prominent yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; friable; few medium roots; strongly acid; gradual smooth boundary.

Btg2—55 to 80 inches; gray (5Y 6/1) sandy clay loam; many coarse prominent yellowish brown (10YR 5/8) mottles and common fine white (10YR 8/1) phosphatic concretions; moderate medium subangular blocky structure; medium acid.

The solum ranges from 48 to 80 inches in thickness. Reaction ranges from very strongly acid to slightly acid in the A and E horizons, from very strongly acid to neutral in the Bh horizon, and from very strongly acid to moderately alkaline in the Bt horizon.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1; or it is neutral and has value of 2.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 1. Combined thickness of the A and E horizons ranges from 10 to 29 inches.

The Bh horizon has hue of 10YR, value of 2, and chroma of 1 or 2, or value of 3 and chroma of 2 or 3; or it has hue of 7.5YR, value of 3, and chroma of 2. Texture is sand, fine sand, or loamy sand.

Some pedons have an E' horizon, which has hue of 10YR, value of 6 or 7, and chroma of 3.

The Bt horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2, value of 5 and chroma of 3 or 8, or value of 4 and chroma of 2; hue of 5Y, value of 5 or 6, and chroma of 1 or 2; or hue of 5GY or 5G, value of 6, and chroma of 1. Mottles in shades of gray, olive, brown, or yellow are in some pedons. Iron-cemented sandstone fragments make up to 10 percent of the volume of this horizon. Texture is sandy loam, fine sandy loam, or sandy clay loam.

Some pedons have a C horizon, which has hue of 10YR, value of 5 or 6, and chroma of 1 or 2; has hue of 2.5Y, value of 6, and chroma of 2; or is neutral and has value of 7. Shell fragments are in some pedons. Texture is fine sand or loamy fine sand.

Wulfert Series

The Wulfert series consists of deep, very poorly drained soils that formed in well decomposed organic material and in the underlying material. These soils are in tidal areas. Slopes are 0 to 1 percent. Wulfert soils are sandy or sandy-skeletal, siliceous, euic, hyperthermic Terric Sulfihemists.

Wulfert soils are associated on the landscape with Durbin and Terra Ceia soils. Durbin soils have organic layers more than than 51 inches thick. Terra Ceia soils are not tidal influenced and have organic layers more than 51 inches thick.

Typical pedon of Wulfert muck, in an area of Durbin and Wulfert mucks, frequently flooded; about 100 feet east and 1,850 feet south of the northwest corner of sec. 35, T. 39 S., R. 23 E.

Oa1—0 to 4 inches; dark reddish brown (5YR 3/2) muck; about 30 percent unrubbed fiber, about 5 percent rubbed; massive; slightly sticky; many fine and common medium roots; about 0.5 percent sulfur; neutral; gradual smooth boundary.

Oa2—4 to 26 inches; very dark grayish brown (10YR 3/2) muck; about 25 percent unrubbed fiber, about 3 percent rubbed; massive; slightly sticky; common fine and medium roots; about 2.4 percent sulfur; neutral; gradual smooth boundary.

Cg1—26 to 32 inches; grayish brown (10YR 5/2) sand; single grained; nonsticky and nonplastic; about 0.3 percent sulfur; neutral; gradual smooth boundary.

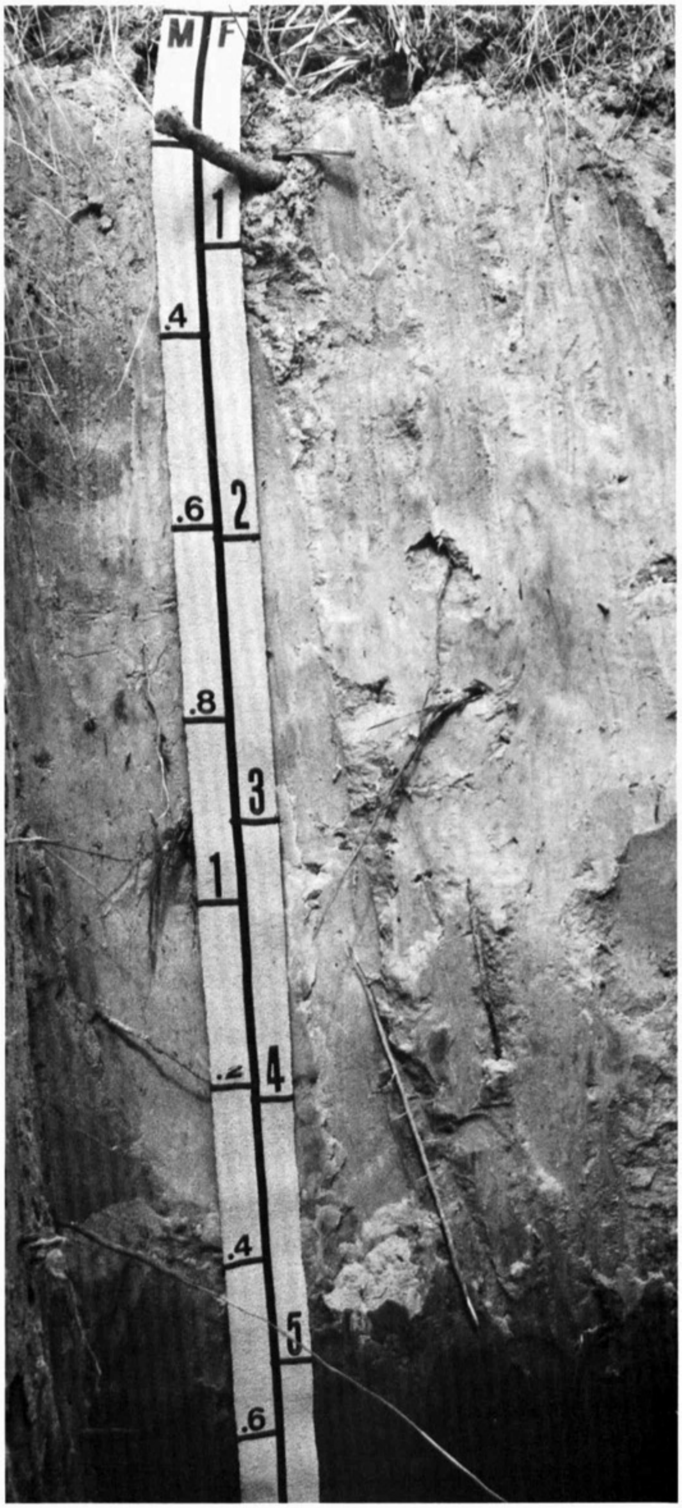

Figure 14.—In Zolfo fine sand, the light colored surface layer and subsurface layer of fine sand extend to a depth of about 59 inches.

Cg2—32 to 80 inches; light brownish gray (2.5Y 6/2) fine sand; single grained; nonsticky and nonplastic; about 0.3 percent sulfur; neutral.

Sulfur content ranges from 0.7 to 2.4 percent in the Oa2 horizon. Reaction ranges from medium acid to neutral in the Oa horizon, measured in 0.01 molar calcium chloride solution. In the C horizon, reaction ranges from extremely acid to neutral. After the soil material dries, reaction is one-half to one unit lower.

The Oa horizon has hue of 5YR, value of 3, and chroma of 2, or hue of 10YR, value of 2 or 3, and chroma of 2, or value of 3 and chroma of 2. Unrubbed fiber content ranges from 5 to 30 percent of the organic volume. Rubbed fiber content is less than 16 percent. The Oa horizon is 26 to 48 inches thick.

The C horizon has hue of 10YR, value of 5 to 7, and chroma of 2, or hue of 2.5Y, value of 6, and chroma of 2. Texture is sand or fine sand.

Zolfo Series

The Zolfo series consists of deep, somewhat poorly drained soils that formed in thick beds of sandy marine sediment (fig. 14). These soils are on low ridges on flatwoods. Slopes range from 0 to 2 percent. Zolfo soils are sandy, siliceous, hyperthermic Grossarenic Entic Haplohumods.

Zolfo soils are associated on the landscape with Tavares, Smyrna, and Ona soils. Tavares soils, which are in higher positions on the landscape than Zolfo soils, do not have a spodic horizon and are better drained. Smyrna soils, which are in lower positions on the landscape, have a spodic horizon within 20 inches of the surface and have a higher seasonal high water table. Ona soils have a spodic horizon just below the surface layer, do not have a subsurface layer, and have a higher seasonal high water table than the Zolfo soils.

Typical pedon of Zolfo fine sand; about 2,100 feet east and 1,000 feet south of the northwest corner of sec. 30, T. 36 S., R. 25 E.

A—0 to 5 inches; gray (10YR 5/1) fine sand; single grained; loose; many fine and medium roots; strongly acid; clear smooth boundary.

E1—5 to 14 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; common fine roots; strongly acid; gradual smooth boundary.

E2—14 to 45 inches; pale brown (10YR 6/3) fine sand; few fine distinct yellowish brown (10YR 5/8) mottles; common light gray (10YR 7/2) uncoated sand grains; single grained; loose; few fine and coarse roots; strongly acid; gradual smooth boundary.

E3—45 to 59 inches; light yellowish brown (10YR 6/4) fine sand; few fine distinct yellowish brown (10YR 5/8) mottles; single grained; loose; few medium roots; strongly acid; clear smooth boundary.

Bh1—59 to 67 inches; dark brown (7.5YR 3/2) fine sand; single grained; loose; very strongly acid; clear smooth boundary.

Bh2—67 to 80 inches; very dark brown (10YR 2/2) fine sand; few medium faint black (10YR 2/1) mottles; single grained; loose; strongly acid.

Reaction ranges from very strongly acid to neutral in the A and E horizons and from extremely acid to slightly acid in the Bh horizon. Texture is sand or fine sand in all horizons, except for the A horizon, which is only fine sand.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 2 to 4. Mottles in shades of brown, yellow, and gray are throughout the E2 and E3 horizons. Combined thickness of the A and E horizons ranges from 53 to 75 inches.

The Bh1 horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3; hue of 7.5YR, value of 3, and chroma of 2; or hue of 5YR, value of 3, and chroma of 3. This horizon is 5 to 15 inches thick.

The Bh2 horizon has hue of 10YR, value of 2 or 3, and chroma of 1 to 3. Black mottles are in some pedons.

Formation of the Soils

In this section, the factors and processes of soil formation are described and related to the soils in the survey area.

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 each 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. The parent material of the soils of DeSoto County consists of beds of sandy and clayey materials that were transported and deposited by waters of the sea that covered the area a number of times during the Pleistocene period. During the high stands of the sea, the Miocene-Pliocene sediments were eroded and redeposited or were reworked on the shallow sea bottom to form marine terraces.

Climate

The climate of DeSoto County is humid-subtropical. Extreme temperatures are moderated by the Gulf of Mexico and somewhat by the Peace River. The average rainfall is about 53 inches per year. In summer, the climate is uniform throughout the survey area.

Few differences among the soils are caused by the climate; however, the climate aids in rapid decomposition of organic matter, and it 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 organic matter content, 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 survey area. Animals, insects, bacteria, and fungi have also been important agents. Plants and animals furnish organic matter to the soil and bring nutrients from the lower layers to the upper layers of the soil. In places, plants and animals cause differences in the amount of organic matter, nitrogen, and nutrients in the soil and differences in soil structure and porosity. For example, crayfish and the roots of trees have penetrated the loamy subsoil and mixed the sandy surface layer with the subsoil.

Micro-organisms, including bacteria and fungi, help to weather and break down minerals and to decompose 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 survey area has affected soil formation more than other living organisms.

Man has influenced the formation of 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 the county mainly through its influence on soil-water relationships.

Other factors of soil formation generally associated with relief, such as erosion, temperature, and plant cover, are of minor importance.

This survey area is made up of flatwoods, freshwater marshes and swamps, sparse areas of sand ridges, and a very sparse area of saltwater swamps and marshes.

Time

Time is an important factor in soil formation. The physical and chemical changes brought about by climate, living organisms, and relief are slow. The length of time needed to convert raw geological material into soil varies according to the nature of the geological 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 within the soil to form horizons varies under differing conditions, but the processes always take a relatively long time.

Processes of Soil Formation

Soil genesis refers to the formation of soil horizons. The differentiation of horizons in soils in DeSoto County is the result of accumulation of organic matter, leaching of carbonates, reduction and transfer of iron, or accumulation of silicate clay minerals. Frequently, more than one of these processes are involved.

Some organic matter has accumulated in the upper layers of most of the soils to form an A horizon. The quantity of organic matter is small in some of the soils and fairly large 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 have been indirect. The soils of the survey area are leached to varying degrees.

The reduction and transfer of iron has occurred in most of the soils in the county except the organic soils. In some of the wet soils, iron in the subsoil forms yellowish brown horizons and some concretions. The Pineda soil, for example, has a yellowish brown layer with few segregated iron concretions.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

Absorption field (septic). The area of natural soil into which a subsurface system of tile or perforated pipe distributes effluent from a septic tank.

AC soil. A soil having only an A and a C horizon. Commonly such soil formed in recent alluvium or on steep rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well-aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.

Bedding. A method of controlling excess water in areas of soils used for citrus and other crops. The surface soil is plowed into regularly spaced elevated beds, and the crops are planted on the beds. The ditches between the beds drain the excess water.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Bottom land. The normal flood plain of a stream, subject to flooding.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity, but is more precise in meaning.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels, i.e., clay coating, clay skin.

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.

Compressible (in tables). The volume of soft soil decreases excessively under load.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

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.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or resting grazingland for a prescribed period.

Depression. An area that is 6 inches to 2 feet or more lower in elevation than the surrounding area and is ponded for long periods of time.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

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.

Effervescence. As used in this survey, the bubbling carbon dioxide when dilute hydrochoric acid is applied to calcium carbonate.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

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.

Excess humus. Too much organic matter for intended use.

Excess salts (in tables). Excess water-soluble salts in the soil restrict the growth of most plants.

Excess sulfur (in tables). An excessive amount of sulfur is in the soil. The sulfur causes extreme acidity if the soil is drained, and the growth of most plants is restricted.

Fast intake (in tables). The movement of water into the soil is rapid.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

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.

Flatwoods. A broad, nearly level landscape of poorly drained, dominantly sandy soils characteristically vegetated with an open forest of pine and a ground cover of saw palmetto and pineland threeawn.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

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.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Hammock. A small island of cabbage palm and oak trees on poorly drained soils that generally is a few inches higher in elevation than the surrounding soils.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an upper case letter represents the major horizons. Numbers or lower case letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual*. The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is, in part, a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as accumulation of clay, sesquioxides, humus, or a combination of these; prismatic or blocky structure; redder or browner colors than those in the A horizon; or a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Arabic numeral 2 precedes the letter C.

R layer.—Consolidated rock (unweathered bedrock) beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the plants that are the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material. This contrasts with percolation, which is movement of water through soil layers or material.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake in inches per hour is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

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.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

No water (in tables). The depth to ground water adversely affects the specified use of the soil.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water to move through the profile. Permeability is measured as the number of inches per hour that water moves through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Subsurface tunnels or pipelike cavities are formed by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poor outlets (in tables). In these areas, surface or subsurface drainage outlets are difficult or expensive to install.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Rangeland. Land on which the potential climax vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Range condition. The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor, on the basis of how much the present plant community has departed from the potential.

Range site. An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

Reaction, soil. A measure of the acidity or alkalinity of a soil expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH 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.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). There is a shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Seepage (in tables). The movement of water through the soil adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slough. A narrow to broad, generally grassy, slightly depressed, poorly defined drainageway that is subject to sheet flow during the rainy season.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in organic matter content than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). An otherwise suitable soil material that is too thin for the specified use.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Unstable fill (in tables). There is a risk of caving or sloughing on banks of fill material.

Water control. Regulation of the water table according to the need of the crop or other use by means of canals, ditches, tile, pumping, or other appropriate methods.

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.

Wetness. Soil is wet during periods of use.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

(Recorded in the period 1951-1980 at Arcadia, Florida)

Month	Temperature (F)													Precipitation (inches)								
	Means			Extremes						Mean number of days										Mean number of days		
										Maximum		Minimum										
	Daily maximum *	Daily minimum *	Monthly *	Record highest	Year	Day	Record lowest	Year	Day	90 and above	32 and below	32 and below	0 and below	Mean *	Greatest Monthly *	Year	Greatest Daily	Year	Day	.10 or more	.50 or more	1.00 or more
January	74.3	48.8	61.6	88	74	1	20	71	21	0	0	3	0	2.17	7.93	58	4.00	61	13	3	1	1
February	75.7	49.3	62.5	92	75	21	24	71	15	0	0	2	0	2.64	7.10	64	2.48	66	23	4	2	1
March	80.8	54.2	67.5	94	77	21	26	80	3	2	0	0	0	2.69	7.10	58	3.63	67	31	4	2	1
April	85.5	57.8	71.7	98	75	30	32	71	8	6	0	0	0	2.13	8.00	51	5.10	63	07	3	1	1
May	89.8	63.2	76.5	101	53	27	43	73	17	17	0	0	0	4.28	9.57	58	5.11	67	22	6	3	1
June	91.2	68.2	79.7	99	52	26	52	61	2	22	0	0	0	7.76	17.40	62	6.26	68	04	10	5	2
July	92.0	70.1	81.1	100	61	31	61	56	31	26	0	0	0	8.26	17.52	65	3.70	67	16	12	5	3
August	92.1	70.9	81.5	99	56	4	60	63	20	28	0	0	0	7.30	17.41	67	4.11	67	12	11	5	2
September	90.2	70.1	80.2	98	52	2	56	72	24	20	0	0	0	7.35	17.05	60	7.38	62	21	10	5	2
October	85.3	63.5	74.4	98	73	5	41	57	28	5	0	0	0	3.95	13.98	52	7.38	53	09	5	3	1
November	79.6	55.6	67.6	93	59	6	23	70	25	0	0	0	0	1.97	4.95	80	3.87	69	14	2	1	1
December	75.1	49.9	62.5	89	72	6	18	62	13	0	0	2	0	2.19	9.10	62	5.00	62	23	3	1	1
Year	84.3	60.1	72.2	101	May 53	27	18	Dec 62	13	126	0	7	0	52.69	17.52	Jul 65	7.38	Sep 62	21	73	34	17

TABLE 2.--FREEZE DATA

PROBABILITY OF LATER DATE IN SPRING (THRU JULY 31) THAN INDICATED (*)

Temp (F)	.90	.80	.70	.60	.50	.40	.30	.20	.10
	Spring freeze dates (mo/day)								
36	1/29	2/09	2/17	2/24	3/02	3/08	3/15	3/23	4/03
32	0/00	1/15	1/25	2/02	2/08	2/15	2/21	3/01	3/11
28	0/00	0/00	0/00	12/30	1/13	1/23	2/01	2/11	2/23
24	0/00	0/00	0/00	0/00	0/00	0/00	0/00	12/21	1/12
20	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00
16	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00

PROBABILITY OF EARLIER DATE IN FALL (BEGINNING AUG 1) THAN INDICATED (*)

	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	11/12	11/19	11/24	11/28	12/01	12/05	12/09	12/14	12/21
32	11/22	12/03	12/11	12/18	12/24	12/31	1/09	1/22	0/00
28	12/16	12/27	1/05	1/14	1/25	2/12	0/00	0/00	0/00
24	12/18	1/06	0/00	0/00	0/00	0/00	0/00	0/00	0/00
20	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00
16	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00

PROBABILITY OF LONGER THAN INDICATED FREEZE FREE PERIOD (DAYS)

	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	312	299	289	281	274	266	258	248	235
32	>365	>365	338	324	315	307	299	290	279
28	>365	>365	>365	>365	>365	>365	344	326	313
24	>365	>365	>365	>365	>365	>365	>365	>365	>365
20	>365	>365	>365	>365	>365	>365	>365	>365	>365
16	>365	>365	>365	>365	>365	>365	>365	>365	>365

(*) Probability of observing a temperature as cold, or colder, later in the spring or earlier in the fall than the indicated date.

0/00 indicates that the probability of occurrence of threshold temperature is less than indicated probability.

TABLE 3.--SUITABILITY AND LIMITATIONS OF MAP UNITS ON THE GENERAL SOIL MAP

[Ratings for each unit are based on the soil or soils that make up the largest percentage of the map unit]

Map unit	Extent of area	Limitations for community development	Suitability for			Potential productivity for woodland
			Citrus	Improved pasture	Vegetables	
1. Zolfo-Tavares	3.4	Severe: wetness.	Moderately suited: wetness.	Moderately suited: droughtiness.	Poorly suited: wetness.	Moderate: wetness.
2. Smyrna-Myakka-Immokalee	48.7	Severe: wetness.	Poorly suited: wetness.	Well suited: wetness.	Poorly suited: wetness.	Moderate: wetness.
3. Oldsmar-EauGallie-Malabar	26.1	Severe: wetness.	Poorly suited: wetness.	Well suited: wetness.	Poorly suited: wetness.	Moderate: wetness.
4. Malabar-Pineda-Felda	6.2	Severe: wetness.	Poorly suited: wetness.	Well suited: wetness.	Poorly suited: wetness.	Moderate: wetness.
5. Valkaria-Basinger-Malabar	8.1	Severe: wetness.	Poorly suited: wetness.	Well suited: wetness.	Poorly suited: wetness.	Moderate: wetness.
6. Floridana-Delray-Felda	0.8	Severe: wetness, ponding.	Not suited---------	Not suited---------	Not suited---------	Not suited.
7. Gator-Terra Ceia	1.6	Severe: wetness, ponding, flooding.	Not suited---------	Not suited---------	Not suited---------	Not suited.
8. Durbin-Wulfert	0.4	Severe: wetness, flooding.	Not suited---------	Not suited---------	Not suited---------	Not suited.
9. Bradenton-Felda-Chobee	4.7	Severe: wetness, flooding.	Poorly suited: wetness.	Well suited: wetness.	Poorly suited: wetness.	High: wetness.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
2	Anclote mucky fine sand, depressional	6,839	1.7
3	Basinger fine sand	17,350	4.3
4	Basinger fine sand, frequently flooded	2,695	0.7
5	Basinger fine sand, depressional	8,618	2.1
6	Bradenton fine sand	4,362	1.1
7	Bradenton-Felda-Chobee complex, occasionally flooded	6,466	1.6
8	Bradenton-Felda-Chobee complex, frequently flooded	8,678	2.1
9	Cassia fine sand	518	0.1
10	Chobee muck, depressional	1,158	0.3
11	Delray mucky fine sand, depressional	4,282	1.1
12	Durbin and Wulfert mucks, frequently flooded	1,266	0.3
13	EauGallie fine sand	28,755	7.1
14	Farmton fine sand	36,527	9.0
15	Felda fine sand	7,423	1.8
16	Felda fine sand, frequently flooded	864	0.2
17	Felda fine sand, depressional	2,620	0.6
18	Floridana mucky fine sand, depressional	7,154	1.8
19	Gator muck, depressional	4,653	1.1
20	Immokalee fine sand	50,286	12.4
21	Malabar fine sand	21,182	5.2
22	Malabar fine sand, high	9,099	2.2
23	Malabar fine sand, depressional	3,795	0.9
24	Myakka fine sand	45,261	11.1
25	Ona fine sand	9,116	2.2
26	Pineda fine sand	11,044	2.7
27	Pineda fine sand, frequently flooded	1,859	0.5
28	Pineda fine sand, depressional	646	0.2
29	Pineda-Pinellas fine sands	1,247	0.3
30	Pomello fine sand	1,063	0.3
31	Pompano fine sand	1,339	0.3
32	Punta fine sand	1,527	0.4
33	Quartzipsamments, nearly level	223	0.1
34	Samsula muck, depressional	1,947	0.5
35	Satellite fine sand	677	0.2
36	Smyrna fine sand	57,130	14.0
37	Tavares fine sand, 0 to 5 percent slopes	4,083	1.0
38	Terra Ceia muck, depressional	609	0.1
39	Terra Ceia muck, frequently flooded	1,771	0.4
40	Valkaria fine sand	15,229	3.7
41	Wabasso fine sand	6,692	1.6
42	Zolfo fine sand	10,814	2.7
	Total	406,867	100.0

TABLE 5.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPLAND 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
		Boxes	Boxes	Tons	Tons	AUM*
2----- Anclote	VIIw	---	---	---	---	---
3----- Basinger	IVw	350	450	---	---	8.0
4----- Basinger	VIw	---	---	---	---	---
5----- Basinger	VIIw	---	---	---	---	---
6----- Bradenton	IIIw	450	575	---	---	9.0
7----- Bradenton-Felda-Chobee	IIIw	---	---	---	---	8.0
8----- Bradenton-Felda-Chobee	Vw	---	---	---	---	8.5
9----- Cassia	VIs	---	---	---	---	6.0
10----- Chobee	VIIw	---	---	---	---	---
11----- Delray	VIIw	---	---	---	---	---
12----- Durbin and Wulfert	VIIIw	---	---	---	---	---
13----- EauGallie	IVw	375	575	8.0	6.0	8.0
14----- Farmton	IVw	325	475	8.0	6.0	8.5
15----- Felda	IIIw	425	575	---	---	8.0
16----- Felda	Vw	---	---	---	---	8.0
17----- Felda	VIIw	---	---	---	---	---
18----- Floridana	VIIw	---	---	---	---	---
19----- Gator	VIIw	---	---	---	---	---
20----- Immokalee	IVw	300	450	8.0	6.0	7.5

See footnote at end of table.

TABLE 5.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPLAND AND PASTURE--Continued

Map symbol and soil name	Land capability	Oranges	Grapefruit	Watermelons	Cucumbers	Bahiagrass
		Boxes	Boxes	Tons	Tons	AUM*
21------------------------ Malabar	IVw	325	525	---	---	8.0
22------------------------ Malabar	IIIw	325	525	8.0	6.0	8.5
23------------------------ Malabar	VIIw	---	---	---	---	---
24------------------------ Myakka	IVw	350	550	8.0	6.0	9.0
25------------------------ Ona	IIIw	450	575	10.0	7.0	8.5
26------------------------ Pineda	IIIw	425	575	---	---	8.0
27------------------------ Pineda	Vw	---	---	---	---	---
28------------------------ Pineda	VIIw	---	---	---	---	---
29------------------------ Pineda-Pinellas	IIIw	425	575	---	---	8.0
30------------------------ Pomello	VIs	---	---	---	---	3.5
31------------------------ Pompano	IVw	---	---	---	---	8.0
32------------------------ Punta	IVw	---	---	---	---	---
33. Quartzipsamments						
34------------------------ Samsula	VIIw	---	---	---	---	---
35------------------------ Satellite	VIs	---	---	---	---	3.0
36------------------------ Smyrna	IVw	400	575	10.0	6.0	8.0
37------------------------ Tavares	IIIs	425	600	---	---	---
38, 39-------------------- Terra Ceia	VIIw	---	---	---	---	---
40------------------------ Valkaria	IVw	350	450	---	---	8.0
41------------------------ Wabasso	IIIw	400	525	10.0	6.0	---

See footnote at end of table.

TABLE 5.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPLAND AND PASTURE--Continued

Map symbol and soil name	Land capability	Oranges	Grapefruit	Watermelons	Cucumbers	Bahiagrass
		Boxes	Boxes	Tons	Tons	AUM*
42------------------------ Zolfo	IIIw	375	500	---	---	7.0

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

TABLE 6.--CAPABILITY CLASSES AND SUBCLASSES

[Miscellaneous areas are excluded. Absence of an entry indicates no acreage]

Class	Total acreage	Major management concerns (Subclass)			
		Erosion (e)	Wetness (w)	Soil problem (s)	Climate (c)
		Acres	Acres	Acres	Acres
I	---	---	---	---	---
II	---	---	---	---	---
III	61,247	---	57,164	4,083	---
IV	283,685	---	283,685	---	---
V	11,401	---	11,401	---	---
VI	4,953	---	2,695	2,258	---
VII	44,092	---	44,092	---	---
VIII	1,266	---	1,266	---	---

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: Anclote	Freshwater Marshes and Ponds	10,000	7,500	5,000
3: Basinger	Slough	8,000	6,000	4,000
5: Basinger	Freshwater Marshes and Ponds	10,000	7,500	5,000
6: Bradenton	Cabbage Palm Hammock	4,000	3,000	2,000
9: Cassia	Sand Pine Scrub	3,500	2,000	1,500
10: Chobee	Freshwater Marshes and Ponds	10,000	7,500	5,000
11: Delray	Freshwater Marshes and Ponds	10,000	7,500	5,000
12:				
Durbin	Salt Marsh	8,000	6,000	4,000
Wulfert.				
13: EauGallie	South Florida Flatwoods	6,000	4,500	3,000
14: Farmton	South Florida Flatwoods	6,000	4,500	3,000
15: Felda	Slough	8,000	6,000	4,000
17: Felda	Freshwater Marshes and Ponds	10,000	7,500	5,000
18: Floridana	Freshwater Marshes and Ponds	10,000	7,500	5,000
19: Gator	Freshwater Marshes and Ponds	10,000	7,500	5,000
20: Immokalee	South Florida Flatwoods	6,000	4,500	3,000
21: Malabar	Slough	8,000	6,000	4,000
22: Malabar	South Florida Flatwoods	6,000	4,500	3,000
23: Malabar	Freshwater Marshes and Ponds	10,000	7,500	5,000
24: Myakka	South Florida Flatwoods	6,000	4,500	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
25: Ona	South Florida Flatwoods	6,000	4,500	3,000
26: Pineda	Slough	8,000	6,000	4,000
27: Pineda	Slough	8,000	6,000	4,000
28: Pineda	Freshwater Marshes and Ponds	10,000	7,500	5,000
29:				
Pineda	Slough	8,000	6,000	4,000
Pinellas.				
30: Pomello	Sand Pine Scrub	3,500	2,000	1,500
31: Pompano	Slough	8,000	6,000	4,000
32: Punta	South Florida Flatwoods	6,000	4,500	3,000
34: Samsula	Freshwater Marshes and Ponds	10,000	7,500	5,000
35: Satellite	Sand Pine Scrub	3,500	2,000	1,500
36: Smyrna	South Florida Flatwoods	6,000	4,500	3,000
37: Tavares	Longleaf Pine-Turkey Oak Hills	4,000	3,000	2,000
38: Terra Ceia	Freshwater Marshes and Ponds	10,000	7,500	5,000
40: Valkaria	Slough	8,000	6,000	4,000
41: Wabasso	South Florida Flatwoods	6,000	4,500	3,000
42: Zolfo	Longleaf Pine-Turkey Oak Hills	4,000	3,000	2,000

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------------------	6W	Slight	Severe	Severe	Moderate	Severe	Baldcypress---------	100	6	Baldcypress.
Anclote							Pondcypress---------	75	2	
							Blackgum------------	---	---	
							Cabbage palm--------	---	---	
							Loblollybay gordonia	---	---	
							Red maple-----------	---	---	
							Sweetbay------------	---	---	
3------------------	8W	Slight	Severe	Severe	Slight	Severe	Slash pine----------	70	8	Slash pine, South Florida slash pine.
Basinger							Live oak------------	---	---	
							Laurel oak----------	---	---	
4------------------	10W	Slight	Severe	Severe	Severe	Severe	Slash pine----------	80	10	Slash pine, South Florida slash pine.
Basinger							Longleaf pine-------	60	4	
5------------------	6W	Slight	Severe	Severe	Moderate	Severe	Baldcypress---------	100	6	Baldcypress.
Basinger							Pondcypress---------	75	2	
							Blackgum------------	---	---	
							Cabbage palm--------	---	---	
							Carolina ash--------	---	---	
							Loblollybay gordonia	---	---	
							Red maple-----------	---	---	
							Sweetbay------------	---	---	
6------------------	11W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----------	90	11	Slash pine, South Florida slash pine.
Bradenton										
7:										
Bradenton----------	11W	Slight	Severe	Severe	Slight	Moderate	Slash pine----------	90	11	Slash pine, South Florida slash pine.
							Longleaf pine-------	75	6	
							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	
Chobee-------------	6W	Slight	Severe	Severe	Moderate	Severe	Baldcypress---------	100	6	Baldcypress.
							Pondcypress---------	75	2	
							Blackgum------------	---	---	
							Cabbage palm--------	---	---	
							Carolina ash--------	---	---	
							Loblollybay gordonia	---	---	
							Red maple-----------	---	---	
							Sweetbay------------	---	---	
							Pond pine-----------	---	---	

See footnote 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*	
8:										
Bradenton	11W	Slight	Severe	Severe	Slight	Moderate	Slash pine	90	11	Slash pine, South Florida slash pine.
							Cabbage palm	---	---	
							Sweetgum	---	---	
							Water oak	---	---	
							Laurel oak	---	---	
Felda	10W	Slight	Moderate	Severe	Slight	Moderate	Slash pine	80	10	Slash pine, South Florida slash pine.
Chobee	6W	Slight	Severe	Moderate	Slight	Severe	Baldcypress	100	6	Baldcypress.
							Red maple	---	---	
							Sweetgum	---	---	
							Blackgum	---	---	
9: Cassia	8S	Slight	Moderate	Severe	Slight	Moderate	Slash pine	70	8	Slash pine, South Florida slash pine, longleaf pine.
							Longleaf pine	60	4	
10: Chobee	6W	Slight	Severe	Severe	Moderate	Severe	Baldcypress	100	6	Baldcypress.
							Pondcypress	75	2	
							Blackgum	---	---	
							Cabbage palm	---	---	
							Carolina ash	---	---	
							Loblollybay gordonia	---	---	
							Red maple	---	---	
							Sweetbay	---	---	
11: Delray	6W	Slight	Severe	Severe	Moderate	Severe	Baldcypress	100	6	Baldcypress.
							Pondcypress	75	2	
							Blackgum	---	---	
							Cabbage palm	---	---	
							Loblollybay gordonia	---	---	
							Red maple	---	---	
							Sweetbay	---	---	
13: EauGallie	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine	80	10	Slash pine, South Florida slash pine.
							Longleaf pine	70	6	
14: Farmton	10W	Slight	Moderate	Slight	Slight	Moderate	Slash pine	80	10	Slash pine, South Florida slash pine.
							Longleaf pine	70	6	
							Live oak	---	---	
15, 16: Felda	10W	Slight	Moderate	Severe	Slight	Moderate	Slash pine	80	10	Slash pine, South Florida slash pine.

See footnote 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*	
17----------------- Felda	6W	Slight	Severe	Severe	Moderate	Severe	Baldcypress---------	100	6	Baldcypress.
							Pondcypress---------	75	2	
							Blackgum------------	---	---	
							Cabbage palm--------	---	---	
							Loblollybay gordonia	---	---	
							Red maple-----------	---	---	
							Sweetbay------------	---	---	
18----------------- Floridana	6W	Slight	Severe	Severe	Moderate	Severe	Baldcypress---------	100	6	Baldcypress.
							Pondcypress---------	75	3	
							Blackgum------------	---	---	
							Cabbage palm--------	---	---	
							Carolina ash--------	---	---	
							Loblollybay gordonia	---	---	
							Red maple-----------	---	---	
							Sweetbay------------	---	---	
19----------------- Gator	6W	Slight	Severe	Severe	Severe	Severe	Baldcypress---------	100	6	Baldcypress.
							Pondcypress---------	75	2	
							Red maple-----------	---	---	
							Pond pine-----------	---	---	
							Cabbage palm--------	---	---	
20----------------- Immokalee	8W	Slight	Moderate	Moderate	Moderate	Moderate	Slash pine----------	70	8	Slash pine, South Florida slash pine.
							Longleaf pine-------	65	5	
21----------------- Malabar	10W	Slight	Moderate	Severe	Slight	Moderate	Slash pine----------	80	10	Slash pine, South Florida slash pine.
							Cabbage palm--------	---	---	
							Live oak------------	---	---	
							Water oak-----------	---	---	
							Laurel oak----------	---	---	
22----------------- Malabar	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----------	80	10	Slash pine, South Florida slash pine.
							Longleaf pine-------	70	6	
							Cabbage palm--------	---	---	
23----------------- Malabar	6W	Slight	Severe	Severe	Moderate	Severe	Baldcypress---------	100	6	Baldcypress.
							Pondcypress---------	75	2	
							Blackgum------------	---	---	
							Cabbage palm--------	---	---	
							Carolina ash--------	---	---	
							Loblollybay gordonia	---	---	
							Red maple-----------	---	---	
							Sweetbay------------	---	---	
24----------------- Myakka	8W	Slight	Moderate	Moderate	Moderate	Moderate	Slash pine----------	70	8	Slash pine, South Florida slash pine.
							Longleaf pine-------	60	4	

See footnote 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
25----------------- Ona	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine---------- Longleaf pine-------	80 70	10 6	Slash pine, South Florida slash pine.
26----------------- Pineda	10W	Slight	Moderate	Severe	Slight	Moderate	Slash pine---------- Cabbage palm--------	80 ---	10 ---	Slash pine, South Florida slash pine.
27----------------- Pineda	10W	Slight	Severe	Severe	Slight	Severe	Slash pine---------- Laurel oak---------- Water oak-----------	80 --- ---	10 --- ---	Slash pine, South Florida slash pine.
28----------------- Pineda	6W	Slight	Severe	Severe	Moderate	Severe	Baldcypress--------- Pondcypress--------- Blackgum------------ Cabbage palm-------- Pond pine----------- Loblollybay gordonia Red maple----------- Sweetbay------------	100 75 --- --- --- --- --- ---	6 2 --- --- --- --- --- ---	Baldcypress.
29:										
Pineda------------	10W	Slight	Moderate	Severe	Slight	Moderate	Slash pine---------- Cabbage palm--------	80 ---	10 ---	Slash pine, South Florida slash pine.
Pinellas----------	10W	Slight	Moderate	Moderate	Moderate	Moderate	Slash pine---------- Cabbage palm--------	80 ---	10 ---	Slash pine, South Florida slash pine.
30----------------- Pomello	4S	Slight	Moderate	Severe	Moderate	Moderate	Longleaf pine------- Sand pine-----------	60 60	4 3	Longleaf pine, slash pine, South Florida slash pine.
31----------------- Pompano	8W	Slight	Severe	Severe	Slight	Moderate	Slash pine---------- South Florida slash pine --------------	70 45	8 4	Slash pine, South Florida slash pine.
32----------------- Punta	8W	Slight	Moderate	Moderate	Moderate	Moderate	Slash pine---------- Live oak------------	65 ---	8 ---	Slash pine, South Florida slash pine.
34----------------- Samsula	6W	Slight	Severe	Severe	Severe	Severe	Baldcypress--------- Pondcypress--------- Blackgum------------ Loblollybay gordonia Red maple----------- Sweetbay------------	100 75 --- --- --- ---	6 2 --- --- --- ---	Baldcypress.
35----------------- Satellite	4S	Slight	Moderate	Severe	Slight	Moderate	Longleaf pine------- Sand pine----------- Sand live oak-------	60 65 ---	4 3 ---	Longleaf pine, slash pine, South Florida slash pine.

See footnote 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
36------------------ Smyrna	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----------	80	10	Slash pine, South Florida slash pine.
							Longleaf pine-------	70	6	
37------------------ Tavares	6S	Slight	Moderate	Moderate	Slight	Moderate	Longleaf pine-------	70	6	Longleaf pine, slash pine, South Florida slash pine.
							Slash pine----------	80	10	
							Turkey oak----------	---	---	
							Bluejack oak--------	---	---	
38, 39------------- Terra Ceia	6W	Slight	Severe	Severe	Severe	Severe	Baldcypress---------	100	6	Baldcypress.
							Pondcypress---------	---	---	
							Sweetgum------------	---	---	
							Blackgum------------	---	---	
							Cabbage palm--------	---	---	
							Sweetbay------------	---	---	
							Water oak-----------	---	---	
							Red maple-----------	---	---	
40------------------ Valkaria	8W	Slight	Severe	Moderate	Slight	Moderate	Slash pine----------	70	8	Slash pine, South Florida slash pine.
							Live oak------------	---	---	
							Water oak-----------	---	---	
							Laurel oak----------	---	---	
41------------------ Wabasso	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----------	80	10	Slash pine, South Florida slash pine.
							Longleaf pine-------	65	5	
							Live oak------------	---	---	
							Water oak-----------	---	---	
42------------------ Zolfo	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----------	80	10	Slash pine, South Florida slash pine, longleaf pine.
							Longleaf pine-------	65	5	
							Turkey oak----------	---	---	
							Laurel oak----------	---	---	
							Water oak-----------	---	---	

* Productivity class is the yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

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: Anclote	Severe: ponding, too sandy.	Severe: ponding, too sandy.	Severe: too sandy, ponding.	Severe: ponding, too sandy.	Severe: ponding.
3: Basinger	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
4: Basinger	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness, flooding.	Severe: wetness, too sandy.	Severe: wetness, flooding.
5: Basinger	Severe: ponding.	Severe: ponding, too sandy.	Severe: too sandy, ponding.	Severe: ponding, too sandy.	Severe: ponding.
6: Bradenton	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
7:					
Bradenton	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
Felda	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
Chobee	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.
8:					
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.
9: Cassia	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: wetness, droughty.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
10-------------------- Chobee	Severe: ponding, percs slowly, excess humus.	Severe: ponding, excess humus, percs slowly.	Severe: excess humus, ponding, percs slowly.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
11-------------------- Delray	Severe: ponding, too sandy.	Severe: ponding, too sandy.	Severe: too sandy, ponding.	Severe: ponding, too sandy.	Severe: ponding.
12:					
Durbin----------------	Severe: flooding, wetness, excess humus.	Severe: wetness, excess humus, excess salt.	Severe: excess humus, wetness, flooding.	Severe: wetness, excess humus.	Severe: excess salt, wetness, flooding.
Wulfert---------------	Severe: wetness, excess humus, excess salt.	Severe: flooding, wetness, excess humus.	Severe: excess humus, wetness, flooding.	Severe: wetness, excess humus.	Severe: excess salt, excess sulfur, wetness.
13-------------------- EauGallie	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, droughty.
14-------------------- Farmton	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
15-------------------- Felda	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
16-------------------- Felda	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness, flooding.	Severe: wetness, too sandy.	Severe: wetness, droughty, flooding.
17-------------------- Felda	Severe: ponding, too sandy.	Severe: ponding, too sandy.	Severe: too sandy, ponding.	Severe: ponding, too sandy.	Severe: ponding, droughty.
18-------------------- 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.
19-------------------- Gator	Severe: ponding, percs slowly, excess humus.	Severe: ponding, excess humus, percs slowly.	Severe: excess humus, ponding, percs slowly.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
20-------------------- Immokalee	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
21, 22---------------- Malabar	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
23-------------------- Malabar	Severe: ponding, too sandy.	Severe: ponding, too sandy.	Severe: too sandy, ponding.	Severe: ponding, too sandy.	Severe: ponding, droughty.

TABLE 9.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
24 Myakka	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
25 Ona	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
26 Pineda	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.
27 Pineda	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy, percs slowly.	Severe: too sandy, wetness, flooding.	Severe: wetness, too sandy.	Severe: wetness, droughty, flooding.
28 Pineda	Severe: ponding, percs slowly, too sandy.	Severe: ponding, too sandy, percs slowly.	Severe: too sandy, ponding, percs slowly.	Severe: ponding, too sandy.	Severe: ponding, droughty.
29:					
Pineda	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.
Pinellas	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
30 Pomello	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
31 Pompano	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
32 Punta	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
33. Quartzipsamments					
34 Samsula	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
35 Satellite	Severe: wetness, too sandy.	Severe: too sandy.	Severe: too sandy, wetness.	Severe: too sandy.	Severe: droughty.
36 Smyrna	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
37 Tavares	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
38-------------------- Terra Ceia	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
39-------------------- Terra Ceia	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: excess humus, wetness, flooding.	Severe: ponding, excess humus, wetness.	Severe: wetness, excess humus, flooding.
40-------------------- Valkaria	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, droughty.
41-------------------- 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.
42-------------------- Zolfo	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty, too sandy.

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							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
2------------------ Anclote	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
3------------------ Basinger	Poor	Poor	Fair	Poor	Poor	Good	Fair	Poor	Poor	Fair.
4------------------ Basinger	Very poor.	Very poor.	Poor	Fair	Poor	Fair	Fair	Very poor.	Poor	Fair.
5------------------ Basinger	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
6------------------ Bradenton	Poor	Fair	Fair	Fair	Fair	Poor	Fair	Fair	Fair	Poor.
7:										
Bradenton---------	Poor	Fair	Fair	Fair	Fair	Poor	Fair	Fair	Fair	Poor.
Felda-------------	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Fair	Poor	Fair.
Chobee------------	Very poor.	Very poor.	Very poor.	Fair	Very poor.	Good	Good	Very poor.	Poor	Good.
8:										
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.
9------------------ Cassia	Very poor.	Poor	Poor	Poor	Fair	Very poor.	Very poor.	Poor	Poor	Very poor.
10----------------- Chobee	Very poor.	Very poor.	Very poor.	Fair	Very poor.	Good	Good	Very poor.	Poor	Good.
11----------------- Delray	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
12:										
Durbin------------	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Poor	Very poor.	Very poor.	Poor.
Wulfert-----------	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Fair	Fair	Very poor.	Very poor.	Fair.
13----------------- EauGallie	Poor	Poor	Fair	Poor	Poor	Poor	Poor	Poor	Poor	Poor.
14----------------- Farmton	Poor	Poor	Fair	Poor	Fair	Poor	Poor	Poor	Fair	Poor.
15, 16------------- Felda	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Fair	Poor	Fair.
17----------------- Felda	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	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
18 Floridana	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
19 Gator	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Good	Good	Very poor.	Very poor.	Good.
20 Immokalee	Poor	Poor	Fair	Poor	Poor	Fair	Poor	Poor	Poor	Poor.
21 Malabar	Poor	Poor	Poor	Poor	Poor	Fair	Fair	Poor	Poor	Fair.
22 Malabar	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Fair	Poor	Fair.
23 Malabar	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Fair	Good	Very poor.	Very poor.	Good.
24 Myakka	Poor	Fair	Fair	Poor	Poor	Fair	Poor	Fair	Poor	Poor.
25 Ona	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Fair	Fair	Fair.
26 Pineda	Poor	Fair	Fair	Poor	Poor	Good	Fair	Fair	Poor	Fair.
27 Pineda	Poor	Poor	Poor	Poor	Poor	Fair	Fair	Poor	Poor	Fair.
28 Pineda	Very poor.	Poor	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
29:										
Pineda	Poor	Fair	Fair	Poor	Poor	Good	Fair	Fair	Poor	Fair.
Pinellas	Very poor.	Poor	Poor	Poor	Poor	Fair	Fair	Poor	Poor	Fair.
30 Pomello	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
31 Pompano	Poor	Fair	Poor	Poor	Poor	Fair	Fair	Poor	Poor	Fair.
32 Punta	Poor	Fair	Good	Poor	Fair	Fair	Poor	Fair	Fair	Poor.
33. Quartzipsamments										
34 Samsula	Very poor.	Very poor.	Poor	Fair	Very poor.	Good	Good	Very poor.	Poor	Good.
35 Satellite	Very poor.	Poor	Poor	Poor	Poor	Poor	Very poor.	Poor	Poor	Very poor.
36 Smyrna	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
37. Tavares	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
38. Terra Ceia	Very poor.	Very poor.	Poor	Poor	Very poor.	Good	Good	Very poor.	Poor	Good.
39. Terra Ceia	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
40. Valkaria	Poor	Fair	Fair	Fair	Fair	Good	Fair	Poor	Poor	Good.
41. Wabasso	Poor	Poor	Poor	Poor	Good	Fair	Poor	Poor	Fair	Poor.
42. Zolfo	Poor	Poor	Fair	Fair	Fair	Poor	Poor	Poor	Fair	Poor.

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 Anclote	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
3 Basinger	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
4 Basinger	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.
5 Basinger	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
6 Bradenton	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
7:						
Bradenton	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness.
Felda	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, droughty.
Chobee	Severe: cutbanks cave, ponding.	Severe: ponding, flooding.	Severe: ponding, flooding.	Severe: ponding, flooding.	Severe: ponding, flooding.	Severe: ponding.
8:						
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.
9 Cassia	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
10 Chobee	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, excess humus.

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
11---------------- Delray	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
12:						
Durbin-----------	Severe: excess humus, wetness.	Severe: flooding, wetness, low strength.	Severe: flooding, wetness.	Severe: flooding, wetness, low strength.	Severe: wetness, flooding.	Severe: excess salt, wetness, flooding.
Wulfert----------	Severe: cutbanks cave, excess humus, wetness.	Severe: flooding, wetness, low strength.	Severe: flooding, wetness.	Severe: flooding, wetness, low strength.	Severe: low strength, wetness, flooding.	Severe: excess salt, excess sulfur, wetness.
13---------------- EauGallie	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
14---------------- Farmton	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
15---------------- Felda	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
16---------------- Felda	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, droughty, flooding.
17---------------- Felda	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, droughty.
18---------------- Floridana	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
19---------------- Gator	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.
20---------------- Immokalee	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
21, 22------------ Malabar	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
23---------------- Malabar	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, droughty.
24---------------- Myakka	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

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
25 Ona	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
26 Pineda	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
27 Pineda	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.	Severe: wetness, flooding.	Severe: wetness, droughty, flooding.
28 Pineda	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, droughty.
29: Pineda	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
Pinellas	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
30 Pomello	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: droughty.
31 Pompano	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
32 Punta	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
33. Quartzipsamments						
34 Samsula	Severe: cutbanks cave, excess humus, ponding.	Severe: ponding, low strength.	Severe: ponding.	Severe: ponding, low strength.	Severe: ponding.	Severe: ponding, excess humus.
35 Satellite	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Severe: droughty.
36 Smyrna	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
37 Tavares	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Severe: droughty.
38 Terra Ceia	Severe: excess humus, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding.	Severe: ponding, excess humus.

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
39----------------- Terra Ceia	Severe: excess humus, wetness.	Severe: wetness, low strength, flooding.	Severe: wetness, low strength, flooding.	Severe: wetness, low strength, flooding.	Severe: wetness, low strength, flooding.	Severe: wetness, excess humus, flooding.
40----------------- Valkaria	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
41----------------- Wabasso	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
42----------------- Zolfo	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: droughty, too sandy.

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------------------ Anclote	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
3------------------ Basinger	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
4------------------ Basinger	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
5------------------ Basinger	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
6------------------ Bradenton	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
7:					
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: ponding, flooding, percs slowly.	Severe: seepage, flooding, ponding.	Severe: seepage, flooding, ponding.	Severe: seepage, flooding, ponding.	Poor: seepage, ponding.
8:					
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.

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
9------------------ Cassia	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
10----------------- Chobee	Severe: ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding.	Severe: seepage, ponding.	Poor: seepage, ponding.
11----------------- Delray	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
12:					
Durbin-------------	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, excess humus.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: wetness, excess humus, excess salt.
Wulfert------------	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, excess humus.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, wetness, excess humus.
13----------------- EauGallie	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness, seepage, too sandy.	Severe: wetness, seepage.	Poor: too sandy, wetness, seepage.
14----------------- Farmton	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
15----------------- Felda	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
16----------------- Felda	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
17----------------- Felda	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
18----------------- Floridana	Severe: ponding, percs slowly, poor filter.	Severe: seepage, ponding.	Severe: ponding.	Severe: ponding, seepage.	Poor: ponding.
19----------------- Gator	Severe: ponding, percs slowly, poor filter.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding.	Severe: seepage, ponding.	Poor: ponding, thin layer.

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
20------------------ Immokalee	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
21, 22-------------- Malabar	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
23------------------ Malabar	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
24------------------ Myakka	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
25------------------ Ona	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
26------------------ Pineda	Severe: wetness, percs slowly, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
27------------------ Pineda	Severe: flooding, wetness, percs slowly.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
28------------------ Pineda	Severe: ponding, percs slowly.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
29:					
Pineda-------------	Severe: wetness, percs slowly, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Pinellas-----------	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
30------------------ Pomello	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
31------------------ Pompano	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.

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
32: Punta	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
33. Quartzipsamments					
34: Samsula	Severe: ponding, poor filter.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus.
35: Satellite	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
36: Smyrna	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
37: Tavares	Moderate: * wetness.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
38: Terra Ceia	Severe: subsides, ponding, poor filter.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus.
39: Terra Ceia	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, excess humus.	Severe: flooding, wetness, excess humus.	Severe: flooding, seepage, wetness.	Poor: wetness, excess humus.
40: Valkaria	Severe: wetness, poor filter.	Severe: wetness, seepage.	Severe: wetness, seepage, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
41: Wabasso	Severe: wetness, percs slowly, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
42: Zolfo	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.

* A hazard of ground water contamination is possible where there are many septic tanks because of poor filtration in the soil.

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 Anclote	Poor: wetness.	Probable	Improbable: too sandy.	Poor: wetness.
3, 4, 5 Basinger	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
6 Bradenton	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
7:				
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.	Improbable: excess fines.	Improbable: too sandy.	Poor: wetness.
8:				
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.
9 Cassia	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
10 Chobee	Poor: wetness.	Improbable: excess fines.	Improbable: too sandy.	Poor: excess humus, wetness.
11 Delray	Poor: wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy, wetness.
12:				
Durbin	Poor: wetness.	Probable	Improbable: too sandy.	Poor: excess humus, excess salt, wetness.
Wulfert	Poor: low strength, wetness.	Probable	Improbable: too sandy.	Poor: excess humus, wetness, excess salt.

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
13 EauGallie	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
14 Farmton	Poor: wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy, wetness.
15, 16, 17 Felda	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
18 Floridana	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, wetness.
19 Gator	Poor: wetness.	Probable	Improbable: too sandy.	Poor: excess humus, wetness.
20 Immokalee	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
21, 22, 23 Malabar	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
24 Myakka	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
25 Ona	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
26, 27, 28 Pineda	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
29:				
Pineda	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
Pinellas	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
30 Pomello	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
31 Pompano	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
32 Punta	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
33. Quartzipsamments				

TABLE 13.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
34-------------------- Samsula	Poor: wetness.	Probable-------------	Improbable: too sandy.	Poor: excess humus, wetness.
35-------------------- Satellite	Fair: wetness.	Probable-------------	Improbable: too sandy.	Poor: too sandy.
36-------------------- Smyrna	Poor: wetness.	Probable-------------	Improbable: too sandy.	Poor: too sandy, wetness.
37-------------------- Tavares	Good-----------------	Probable-------------	Improbable: too sandy.	Poor: too sandy.
38, 39---------------- Terra Ceia	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
40-------------------- Valkaria	Poor: wetness.	Probable-------------	Improbable: too sandy.	Poor: wetness, too sandy.
41-------------------- Wabasso	Poor: wetness.	Probable-------------	Improbable: too sandy.	Poor: too sandy, wetness.
42-------------------- Zolfo	Fair: wetness.	Probable-------------	Improbable: too sandy.	Poor: too sandy.

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--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
2----------------- Anclote	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, fast intake, soil blowing.	Ponding, too sandy, soil blowing.	Wetness.
3----------------- Basinger	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
4----------------- Basinger	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
5----------------- Basinger	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, droughty, fast intake.	Ponding, too sandy, soil blowing.	Wetness, droughty.
6----------------- Bradenton	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy.	Wetness, droughty.
7:							
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-----------	Moderate: seepage.	Severe: ponding, piping, seepage.	Severe: slow refill, cutbanks cave.	Ponding, flooding, percs slowly.	Ponding, fast intake, soil blowing.	Ponding, soil blowing, percs slowly.	Wetness, percs slowly.

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
8:							
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, fast intake, soil blowing.	Wetness, soil blowing, percs slowly.	Wetness, rooting depth, percs slowly.
9 Cassia	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Droughty.
10 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.
11 Delray	Severe: seepage.	Severe: seepage, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, droughty, fast intake.	Ponding, too sandy, soil blowing.	Wetness, droughty.
12:							
Durbin	Severe: seepage.	Severe: excess humus, wetness, excess salt.	Severe: salty water, cutbanks cave.	Flooding, subsides, excess salt.	Wetness, flooding, excess salt.	Wetness	Wetness, excess salt.
Wulfert	Severe: seepage.	Severe: seepage, piping, excess humus.	Severe: salty water, cutbanks cave.	Flooding, subsides, excess salt.	Wetness, soil blowing, flooding.	Wetness, soil blowing.	Wetness, excess salt.
13 EauGallie	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Fast intake, wetness, droughty.	Wetness, too sandy, soil blowing.	Wetness, 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
14----------------- Farmton	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
15----------------- Felda	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
16----------------- Felda	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
17----------------- Felda	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, droughty, fast intake.	Ponding, too sandy, soil blowing.	Wetness, droughty.
18----------------- 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.
19----------------- Gator	Severe: seepage.	Severe: piping, ponding.	Severe: slow refill, cutbanks cave.	Ponding, percs slowly, subsides.	Ponding, soil blowing, percs slowly.	Ponding, soil blowing, percs slowly.	Wetness, percs slowly.
20----------------- Immokalee	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
21----------------- Malabar	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
22----------------- Malabar	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, soil blowing, too sandy.	Wetness, droughty.
23----------------- Malabar	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, droughty, fast intake.	Ponding, too sandy, soil blowing.	Wetness, droughty.

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
24-----Myakka	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
25-----Ona	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy.	Wetness, droughty.
26-----Pineda	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Percs slowly, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty, percs slowly.
27-----Pineda	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
28-----Pineda	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: slow refill, cutbanks cave.	Ponding, percs slowly, cutbanks cave.	Ponding, droughty, fast intake.	Ponding, too sandy, soil blowing.	Wetness, droughty, percs slowly.
29:							
Pineda-----	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Percs slowly, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty, percs slowly.
Pinellas-----	Severe: seepage.	Severe: seepage, piping, wetness.	Moderate: slow refill.	Favorable-----	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness.
30-----Pomello	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Droughty.
31-----Pompano	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.

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
32---------------- Punta	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
33. Quartzipsamments							
34---------------- Samsula	Severe: seepage.	Severe: excess humus, ponding.	Severe: cutbanks cave.	Ponding, subsides.	Ponding, soil blowing.	Ponding, soil blowing.	Wetness.
35---------------- Satellite	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
36---------------- Smyrna	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
37---------------- Tavares	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
38---------------- Terra Ceia	Severe: seepage.	Excess humus, ponding.	Slight---------	Ponding, subsides.	Ponding, soil blowing.	Ponding, soil blowing.	Wetness.
39---------------- Terra Ceia	Severe: seepage.	Severe: excess humus, wetness.	Slight---------	Flooding, subsides.	Wetness, soil blowing, flooding.	Wetness, soil blowing.	Wetness.
40---------------- Valkaria	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
41---------------- 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.
42---------------- Zolfo	Severe: seepage.	Severe: seepage.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	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: Unified	Classification: AASHTO	Frag-ments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct					Pct	
2----------------- Anclote	0-14	Mucky fine sand, fine sand, sand.	SP-SM	A-3, A-2-4	0	100	95-100	85-100	2-12	---	NP
	14-80	Sand, fine sand, loamy fine sand.	SP, SP-SM, SM, SM-SC	A-3, A-2-4	0	100	100	95-100	5-20	<16	NP-5
3----------------- Basinger	0-30	Fine sand, sand.	SP	A-3	0	100	100	85-100	1-4	---	NP
	30-54	Sand, fine sand.	SP, SP-SM	A-3, A-2-4	0	100	100	85-100	2-12	---	NP
	54-80	Sand, fine sand.	SP, SP-SM	A-3, A-2-4	0	100	100	85-100	2-12	---	NP
4----------------- Basinger	0-16	Fine sand--------	SP	A-3	0	100	100	85-100	1-4	---	NP
	16-36	Sand, fine sand.	SP, SP-SM	A-3, A-2-4	0	100	100	85-100	2-12	---	NP
	36-80	Sand, fine sand.	SP, SP-SM	A-3, A-2-4	0	100	100	85-100	2-12	---	NP
5----------------- Basinger	0-2	Fine sand--------	SP	A-3	0	100	100	85-100	1-4	---	NP
	2-34	Sand, fine sand.	SP, SP-SM	A-3, A-2-4	0	100	100	85-100	2-12	---	NP
	34-45	Sand, fine sand.	SP, SP-SM	A-3, A-2-4	0	100	100	85-100	2-12	---	NP
	45-80	Sand, fine sand.	SP, SP-SM	A-3, A-2-4	0	100	100	85-100	2-12	---	NP
6----------------- Bradenton	0-4	Fine sand--------	SP-SM	A-3, A-2-4	0	100	100	80-100	5-12	---	NP
	4-15	Sand, fine sand.	SP-SM	A-3, A-2-4	0	100	100	80-100	5-12	---	NP
	15-26	Sandy loam, fine sandy loam, loamy fine sand.	SC, SM-SC, SM	A-2-4, A-2-6	0	100	100	80-100	20-35	<40	4-18
	26-80	Fine sand, loamy fine sand, fine sandy 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
7:											
Bradenton-------	0-3	Fine sand--------	SP-SM	A-3, A-2-4	0	100	100	80-100	5-12	---	NP
	3-10	Sand, fine sand.	SP-SM	A-3, A-2-4	0	100	100	80-100	5-12	---	NP
	10-65	Sandy loam, fine sandy loam, loamy fine sand.	SC, SM-SC, SM	A-2-4, A-2-6	0	100	100	80-100	20-35	<40	4-18
	65-80	Fine sand, loamy fine sand, fine sandy 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
Felda-----------	0-30	Fine sand--------	SP, SP-SM	A-3	0	100	100	90-99	2-5	---	NP
	30-75	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
	75-80	Sand, fine sand, loamy sand.	SP, SP-SM	A-3, A-2-4	0	100	100	80-99	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	
7: Chobee----------	0-4	Mucky loamy fine sand.	SP-SM, SM	A-3, A-2-4	0	100	100	95-100	5-20	<40	NP-10
	4-18	Loamy fine sand	SP-SM, SM	A-2-4	0	100	100	80-100	12-25	<40	NP-10
	18-68	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	84-100	12-45	<45	NP-25
	68-80	Fine sand, loamy sand, sandy clay loam.	SP-SM, SM, SC, SM-SC	A-2-4, A-2-6, A-6, A-7	0	100	100	80-100	12-45	<45	NP-25
8: Bradenton-------	0-3	Fine sand--------	SP-SM	A-3, A-2-4	0	100	100	80-100	5-12	---	NP
	3-10	Sand, fine sand.	SP-SM	A-3, A-2-4	0	100	100	80-100	5-12	---	NP
	10-65	Sandy loam, fine sandy loam, loamy fine sand.	SC, SM-SC, SM	A-2-4, A-2-6	0	100	100	80-100	20-35	<40	4-18
	65-80	Fine sand, loamy fine sand, fine sandy 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
Felda-----------	0-30	Fine sand--------	SP, SP-SM	A-3	0	100	100	90-99	2-5	---	NP
	30-75	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
	75-80	Sand, fine sand, loamy sand.	SP, SP-SM	A-3, A-2-4	0	100	100	80-99	2-12	---	NP
Chobee----------	0-18	Loamy fine sand	SP-SM, SM, SM-SC	A-2-4	0	100	100	85-99	12-25	<40	NP-10
	18-68	Sandy clay loam, fine sandy loam.	SC	A-2-6, A-2-7, A-6, A-7	0	100	100	84-99	25-45	35-45	20-25
	68-80	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
9--------------- Cassia	0-22	Fine sand--------	SP, SP-SM	A-3	0	100	100	90-100	2-7	---	NP
	22-28	Sand, fine sand, loamy sand.	SP-SM, SM	A-3, A-2-4	0	100	100	90-100	5-20	---	NP
	28-55	Sand, fine sand.	SP, SP-SM	A-3	0	100	100	90-100	2-10	---	NP
	55-80	Sand, fine sand, loamy sand.	SP-SM, SM	A-3, A-2-4	0	100	100	90-100	5-20	---	NP
10--------------- Chobee	0-2	Muck-------------	PT	---	0	---	---	---	---	---	---
	2-65	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	84-100	12-45	<45	NP-25
	65-80	Fine sand, loamy sand.	SP-SM, SM, SM-SC	A-2-4	0	100	100	80-100	12-25	<40	NP-10
11--------------- Delray	0-23	Mucky fine sand	SP-SM, SM, SM-SC	A-3, A-2-4	0	100	100	95-100	5-20	<20	NP-5
	23-65	Fine sand, sand.	SP-SM	A-3, A-2-4	0	100	100	95-100	5-12	---	NP
	65-75	Sandy loam, fine sandy loam, sandy clay loam.	SM, SM-SC, SC	A-2-4, A-2-6	0	100	100	95-100	20-35	<40	NP-15
	75-80	Loamy fine sand, loamy sand, fine sandy loam.	SM, SM-SC	A-2-4	0	100	100	95-100	13-20	<20	NP-5

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	
12:											
Durbin----------	0-75	Muck-------------	PT	---	0	---	---	---	---	---	---
	75-80	Sand, fine sand, loamy fine sand.	SP-SM, SM	A-2-4, A-3	0	100	100	85-95	5-15	---	NP
Wulfert---------	0-26	Muck-------------	PT	---	---	---	---	---	---	---	---
	26-80	Sand, fine sand.	SP-SM, SM	A-3, A-2-4	0	100	100	85-100	5-18	---	NP
13--------------- EauGallie	0-29	Fine sand--------	SP, SP-SM	A-3	0	100	100	80-98	2-5	---	NP
	29-47	Sand, fine sand.	SP-SM, SM	A-3, A-2-4	0	100	100	80-98	5-20	---	NP
	47-68	Sand, fine sand.	SP, SP-SM	A-3, A-2-4	0	100	100	80-98	2-12	---	NP
	68-80	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
14--------------- Farmton	0-4	Fine sand--------	SP, SP-SM, SM	A-3, A-2-4	0	100	100	80-99	2-16	---	NP
	4-34	Fine sand, sand.	SP, SP-SM	A-3	0	100	100	80-99	2-7	---	NP
	34-48	Fine sand, sand, loamy fine sand.	SP-SM, SM	A-3, A-2-4	0	100	100	80-99	5-20	---	NP
	48-80	Fine sandy loam, sandy loam, sandy clay loam.	SM, SM-SC, SC	A-2-4, A-2-6	0	100	100	80-99	15-35	<35	NP-15
15--------------- Felda	0-29	Fine sand--------	SP, SP-SM	A-3	0	100	100	90-99	2-5	---	NP
	29-42	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
	42-80	Sand, fine sand, loamy sand.	SP, SP-SM	A-3, A-2-4	0	100	100	80-99	2-12	---	NP
16--------------- Felda	0-22	Fine sand--------	SP, SP-SM	A-3	0	100	100	90-99	2-5	---	NP
	22-65	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
	65-80	Sand, fine sand, loamy sand.	SP, SP-SM	A-3, A-2-4	0	100	100	80-99	2-12	---	NP
17--------------- Felda	0-32	Sand, fine sand.	SP, SP-SM	A-3	0	100	100	90-100	2-5	---	NP
	32-49	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
	49-80	Sand, fine sand, loamy sand.	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
18--------------- Floridana	0-22	Mucky fine sand, fine sand, sand.	SP-SM, SM	A-3, A-2-4	0	100	100	80-90	5-25	---	NP
	22-34	Sand, fine sand.	SP, SP-SM	A-3	0	100	100	80-90	2-10	---	NP
	34-45	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
	45-80	Sand, loamy sand, loamy fine sand.	SP-SM, SM	A-3, A-2-4	0	100	100	80-90	5-25	---	NP
19--------------- Gator	0-22	Muck-------------	PT	A-8	0	---	---	---	---	---	---
	22-80	Loam, fine sandy loam, sandy clay loam.	SM-SC, SC, SM	A-2-4, A-2-6	0	100	100	80-99	25-35	<40	NP-15

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--------------- Immokalee	0-5	Fine sand--------	SP, SP-SM	A-3	0	100	100	70-100	2-10	---	NP
	5-43	Fine sand, sand.	SP, SP-SM	A-3	0	100	100	70-100	2-10	---	NP
	43-65	Fine sand, sand, loamy fine sand.	SP-SM, SM	A-3, A-2-4	0	100	100	70-100	5-21	---	NP
	65-80	Fine sand, sand.	SP, SP-SM	A-3	0	100	100	70-100	2-10	---	NP
21--------------- Malabar	0-12	Fine sand, sand.	SP, SP-SM	A-3	0	100	100	80-100	2-10	---	NP
	12-50	Sand, fine sand.	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	3-12	---	NP
	50-80	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
22--------------- Malabar	0-18	Fine sand--------	SP, SP-SM	A-3	0	100	100	80-100	2-10	---	NP
	18-40	Sand, fine sand.	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	3-12	---	NP
	40-52	Sand, fine sand.	SP, SP-SM	A-3	0	100	100	80-100	2-10	---	NP
	52-80	Fine sandy loam, sandy clay loam.	SC, SM-SC, SM	A-2, A-4, A-6	0	100	100	80-100	20-40	<35	NP-20
23--------------- Malabar	0-25	Fine sand--------	SP, SP-SM	A-3	0	100	100	80-100	2-10	---	NP
	25-51	Sand, fine sand.	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	3-12	---	NP
	51-80	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
24--------------- Myakka	0-22	Fine sand--------	SP, SP-SM	A-3	0	100	100	85-100	2-10	---	NP
	22-28	Sand, fine sand, loamy fine sand.	SM, SP-SM	A-3, A-2-4	0	100	100	85-100	5-20	---	NP
	28-80	Sand, fine sand.	SP, SP-SM	A-3	0	100	100	85-100	2-8	---	NP
25--------------- Ona	0-5	Fine sand--------	SP-SM, SP	A-3	0	100	100	85-95	3-10	---	NP
	5-20	Fine sand, sand.	SP-SM, SM	A-3, A-2-4	0	100	100	85-95	5-20	---	NP
	20-46	Fine sand, sand.	SP-SM, SP	A-3	0	100	100	85-95	3-10	---	NP
	46-80	Fine sand, sand.	SP-SM, SM	A-3, A-2-4	0	100	100	85-99	5-20	---	NP
26--------------- Pineda	0-3	Fine sand--------	SP, SP-SM	A-3	0	100	100	80-95	2-8	---	NP
	3-28	Sand, fine sand.	SP, SP-SM	A-3	0	100	100	80-95	2-10	---	NP
	28-41	Sandy loam, fine sandy loam, sandy clay loam.	SC, SM-SC, SM	A-2-4, A-2-6	0	100	100	65-95	15-35	<35	NP-20
	41-80	Sand, loamy sand, fine sand.	SP-SM, SM, SP	A-3, A-2-4	0	95-100	90-100	80-95	4-15	---	NP
27--------------- Pineda	0-24	Fine sand--------	SP, SP-SM	A-3	0	100	100	80-95	2-5	---	NP
	24-37	Sandy loam, fine sandy loam, sandy clay loam.	SC, SM-SC	A-2-4, A-2-6	0	100	100	80-95	15-35	20-30	4-12
	37-80	Sand, loamy sand, fine sand.	SP-SM, SM, SP	A-3, A-2-4	0	100	100	80-95	4-15	---	NP
28--------------- Pineda	0-38	Fine sand--------	SP, SP-SM	A-3	0	100	100	80-95	2-5	---	NP
	38-80	Sandy loam, fine sandy loam, sandy clay loam.	SC, SM-SC	A-2-4, A-2-6	0	100	100	80-95	15-35	20-30	4-12

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	
29:											
Pineda----------	0-5	Fine sand--------	SP, SP-SM	A-3	0	100	100	80-95	2-8	---	NP
	5-31	Sand, fine sand.	SP, SP-SM	A-3	0	100	100	80-95	2-10	---	NP
	31-70	Sandy loam, fine sandy loam, sandy clay loam.	SC, SM-SC, SM	A-2-4, A-2-6	0	100	100	65-95	15-35	<35	NP-20
	70-80	Sand, loamy sand, fine sand.	SP-SM, SM, SP	A-3, A-2-4	0	95-100	90-100	80-95	4-15	---	NP
Pinellas--------	0-20	Fine sand--------	SP	A-3	0	100	100	90-100	2-4	---	NP
	20-30	Sand, fine sand.	SP-SM	A-3, A-2-4	0	100	100	90-100	5-12	---	NP
	30-42	Fine sandy loam, sandy clay loam.	SP-SM, SM, SM-SC, SC	A-2-4, A-2-6	0	100	100	90-100	12-35	20-30	5-13
	42-80	Sand, fine sand.	SP, SP-SM	A-3, A-2-4	0-5	80-100	75-100	60-95	2-12	---	NP
30--------------- Pomello	0-46	Fine sand, sand.	SP, SP-SM	A-3	0	100	100	60-100	1-8	---	NP
	46-59	Coarse sand, sand, fine sand.	SP-SM, SM	A-3, A-2-4	0	100	100	60-100	6-15	---	NP
	59-80	Coarse sand, sand, fine sand.	SP, SP-SM	A-3	0	100	100	60-100	4-10	---	NP
31--------------- Pompano	0-80	Fine sand, sand.	SP, SP-SM	A-3, A-2-4	0	100	100	75-100	1-12	---	NP
32--------------- Punta	0-3	Fine sand--------	SP, SP-SM	A-3	0	100	100	85-100	2-10	<30	NP
	3-60	Fine sand, sand.	SP, SP-SM	A-3	0	100	100	85-100	1-8	<30	NP
	60-80	Fine sand, sand.	SP-SM, SM	A-3, A-2-4	0	100	100	85-100	5-15	<30	NP
33. Quartzipsamments											
34--------------- Samsula	0-19	Muck-------------	PT	---	---	---	---	---	---	---	---
	19-80	Sand, fine sand, loamy sand.	SP-SM, SM, SP	A-3, A-2-4	0	100	100	80-100	2-20	---	NP
35--------------- Satellite	0-4	Fine sand--------	SP, SP-SM	A-3	0	100	100	60-96	1-5	---	NP
	4-80	Coarse sand, sand, fine sand.	SP, SP-SM	A-3	0	100	100	60-96	1-5	---	NP
36--------------- Smyrna	0-12	Fine sand--------	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
	12-15	Sand, fine sand, loamy fine sand.	SM, SP-SM	A-3, A-2-4	0	100	100	80-100	5-20	---	NP
	15-37	Sand, fine sand.	SP, SP-SM	A-3	0	100	100	80-100	2-10	---	NP
	37-80	Sand, fine sand, loamy fine sand.	SM, SP-SM	A-3, A-2-4	0	100	100	80-100	5-20	---	NP
37--------------- Tavares	0-6	Fine sand--------	SP, SP-SM	A-3	0	100	95-100	85-100	2-10	---	NP
	6-80	Sand, fine sand.	SP, SP-SM	A-3	0	100	95-100	85-100	2-10	---	NP
38--------------- Terra Ceia	0-58	Muck-------------	PT	A-8	---	---	---	---	---	---	---
	58-80	Variable---------									
39--------------- Terra Ceia	0-72	Muck-------------	PT	A-8	---	---	---	---	---	---	---
	72-80	Variable---------									

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--------------- Valkaria	0-6	Fine sand--------	SP, SP-SM	A-3	0	100	75-100	75-100	2-10	---	NP
	6-25	Sand, fine sand.	SP, SP-SM	A-3	0	100	75-100	75-100	2-10	---	NP
	25-31	Sand, fine sand.	SP, SP-SM	A-3	0	100	75-100	75-100	3-10	---	NP
	31-80	Sand, fine sand.	SP, SP-SM	A-3	0	100	75-100	75-100	2-10	---	NP
41--------------- Wabasso	0-26	Fine sand--------	SP, SP-SM	A-3	0	100	100	95-100	2-10	---	NP
	26-31	Sand, fine sand, loamy sand.	SP-SM, SM	A-3, A-2-4	0	100	100	95-100	5-20	---	NP
	31-80	Sandy loam, fine sandy loam, sandy clay loam.	SC, SM-SC, SM	A-2-4, A-2-6	0	100	100	95-100	20-35	20-30	5-13
42--------------- Zolfo	0-5	Fine sand--------	SP-SM	A-3, A-2-4	0	100	100	90-100	5-12	---	NP
	5-59	Fine sand, sand.	SP-SM, SM	A-3, A-2-4	0	100	100	90-100	5-18	---	NP
	59-80	Fine sand, sand.	SP-SM, SM	A-3, A-2-4	0	100	100	90-100	5-18	---	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	Salinity	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm					Pct
2 Anclote	0-14	2-8	1.30-1.45	6.0-20	0.10-0.15	5.1-8.4	<2	Low	0.10	5	2	2-10
	14-80	1-13	1.50-1.65	6.0-20	0.03-0.10	5.1-8.4	<2	Low	0.10			
3 Basinger	0-30	0-4	1.40-1.65	6.0-20	0.03-0.07	3.6-7.3	<2	Low	0.10	5	2	.5-2
	30-54	0-4	1.40-1.65	6.0-20	0.05-0.10	3.6-7.3	<2	Low	0.10			
	54-80	1-6	1.40-1.65	6.0-20	0.10-0.15	3.6-7.3	<2	Low	0.10			
4 Basinger	0-16	0-4	1.40-1.55	6.0-20	0.03-0.07	3.6-7.3	<2	Low	0.10	5	2	.2-1
	16-36	1-6	1.40-1.65	6.0-20	0.10-0.15	3.6-7.3	<2	Low	0.10			
	36-80	1-3	1.50-1.70	6.0-20	0.05-0.10	3.6-7.3	<2	Low	0.10			
5 Basinger	0-2	0-4	1.40-1.55	6.0-20	0.05-0.10	3.6-7.3	<2	Low	0.10	5	2	1-8
	2-34	0-4	1.40-1.55	6.0-20	0.05-0.10	3.6-7.3	<2	Low	0.10			
	34-45	1-3	1.40-1.65	6.0-20	0.10-0.15	3.6-7.3	<2	Low	0.10			
	45-80	1-3	1.50-1.70	6.0-20	0.05-0.10	3.6-7.3	<2	Low	0.10			
6 Bradenton	0-4	1-6	1.30-1.50	6.0-20	0.08-0.12	5.1-7.3	<2	Low	0.10	5	2	2-8
	4-15	1-6	1.50-1.70	6.0-20	0.03-0.07	5.1-7.8	<2	Low	0.20			
	15-26	10-18	1.55-1.70	0.6-2.0	0.10-0.15	6.1-8.4	<2	Low	0.24			
	26-80	1-18	1.55-1.70	0.6-6.0	0.03-0.10	6.6-8.4	<2	Low	0.24			
7:												
Bradenton	0-3	1-6	1.30-1.50	6.0-20	0.08-0.12	5.1-7.3	<2	Low	0.10	5	2	2-8
	3-10	1-6	1.50-1.70	6.0-20	0.03-0.07	5.1-7.8	<2	Low	0.20			
	10-65	10-18	1.55-1.70	0.6-2.0	0.10-0.15	6.1-8.4	<2	Low	0.24			
	65-80	1-18	1.55-1.70	0.6-6.0	0.03-0.10	6.6-8.4	<2	Low	0.24			
Felda	0-30	1-3	1.40-1.55	6.0-20	0.02-0.05	5.1-7.8	<2	Low	0.10	5	2	1-4
	30-75	13-30	1.50-1.65	0.6-6.0	0.10-0.15	6.1-7.8	<2	Low	0.24			
	75-80	1-10	1.50-1.65	6.0-20	0.02-0.05	6.1-7.8	<2	Low	0.10			
Chobee	0-4	2-8	1.25-1.45	6.0-20	0.15-0.25	5.1-7.3	<2	Low	0.10	5	2	10-20
	4-18	0-15	1.25-1.50	2.0-6.0	0.10-0.15	5.6-7.3	<2	Low	0.15			
	18-68	10-30	1.40-1.75	<0.2	0.12-0.17	5.6-8.4	<2	Low	0.15			
	68-80	0-15	1.45-1.75	2.0-6.0	0.10-0.15	5.6-7.8	<2	Low	0.15			
8:												
Bradenton	0-3	1-6	1.30-1.50	6.0-20	0.08-0.12	5.1-7.3	<2	Low	0.10	5	2	2-8
	3-10	1-6	1.50-1.70	6.0-20	0.03-0.07	5.1-7.3	<2	Low	0.20			
	10-65	10-18	1.55-1.70	0.6-2.0	0.10-0.15	6.1-8.4	<2	Low	0.24			
	65-80	1-18	1.55-1.70	0.6-6.0	0.03-0.10	7.4-8.4	<2	Low	0.24			
Felda	0-30	1-3	1.40-1.55	6.0-20	0.02-0.05	5.1-7.8	<2	Low	0.10	5	2	1-4
	30-75	13-30	1.50-1.65	0.6-6.0	0.10-0.15	6.1-7.8	<2	Low	0.24			
	75-80	1-10	1.50-1.65	6.0-20	0.02-0.05	6.1-7.8	<2	Low	0.10			
Chobee	0-18	7-15	1.45-1.50	2.0-6.0	0.10-0.15	6.1-7.3	<2	Low	0.10	5	2	2-7
	18-68	20-35	1.55-1.75	<0.2	0.12-0.17	7.4-8.4	<2	Moderate	0.32			
	68-80	7-20	1.60-1.75	0.2-6.0	0.06-0.10	7.4-8.4	<2	Low	0.20			
9 Cassia	0-22	1-4	1.30-1.55	6.0-20	0.03-0.07	4.5-6.0	<2	Low	0.10	5	2	<1
	22-28	2-10	1.30-1.55	0.6-6.0	0.10-0.15	4.5-6.0	<2	Low	0.15			
	28-55	1-5	1.40-1.60	6.0-20	0.03-0.07	4.5-6.0	<2	Low	0.10			
	55-80	2-10	1.30-1.55	0.6-6.0	0.10-0.15	4.5-6.0	<2	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	Salinity	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm					Pct
10---------------- Chobee	0-2	---	0.15-0.35	6.0-20	0.30-0.50	5.1-7.3	<2	Low--------	0.10	5	2	25-35
	2-65	10-30	1.40-1.75	<0.2	0.12-0.17	5.6-8.4	<2	Low--------	0.15			
	65-80	0-15	1.45-1.75	2.0-6.0	0.10-0.15	5.6-7.8	<2	Low--------	0.15			
11---------------- Delray	0-23	2-8	1.25-1.45	6.0-20	0.15-0.25	5.6-7.3	<2	Low--------	0.10	5	2	6-12
	23-65	1-7	1.50-1.65	6.0-20	0.05-0.08	6.1-7.3	<2	Low--------	0.10			
	65-75	13-30	1.45-1.60	0.6-6.0	0.10-0.15	6.6-7.8	<2	Low--------	0.24			
	75-80	10-18	1.50-1.65	2.0-6.0	0.07-0.10	6.6-7.8	<2	Low--------	0.17			
12:												
Durbin-----------	0-75	---	0.20-0.50	6.0-20	0.20-0.25	3.6-7.3	>16	Low--------	----	2	2	40-65
	75-80	2-5	1.30-1.45	6.0-20	0.10-0.15	3.6-8.4	>16	Low--------	0.10			
Wulfert----------	0-26	0-1	0.20-0.40	6.0-20	0.20-0.25	5.6-7.3	>16	-----------	----	2	2	---
	26-80	2-5	1.50-1.60	6.0-20	0.02-0.08	3.6-7.3	>16	Low--------	0.17			
13---------------- EauGallie	0-29	0-5	1.25-1.50	6.0-20	0.02-0.07	4.5-6.0	<2	Low--------	0.10	5	2	2-8
	29-47	1-8	1.45-1.60	0.6-6.0	0.15-0.25	4.5-6.5	<2	Low--------	0.15			
	47-68	1-5	1.45-1.65	6.0-20	0.02-0.05	4.5-7.8	<2	Low--------	0.10			
	68-80	13-31	1.55-1.70	0.06-0.6	0.10-0.20	4.5-7.8	<2	Low--------	0.20			
14---------------- Farmton	0-4	1-4	1.35-1.50	6.0-20	0.08-0.20	3.6-5.5	<2	Low--------	0.10	5	2	1-2
	4-34	1-4	1.50-1.65	6.0-20	0.02-0.10	3.6-5.5	<2	Low--------	0.10			
	34-48	2-7	1.55-1.70	0.6-2.0	0.10-0.25	3.6-5.5	<2	Low--------	0.15			
	48-80	12-27	1.60-1.70	<0.2	0.10-0.17	3.6-5.5	<2	Low--------	0.24			
15---------------- Felda	0-29	1-3	1.40-1.55	6.0-20	0.02-0.05	5.1-7.8	<2	Low--------	0.10	5	2	1-4
	29-42	13-30	1.50-1.65	0.6-6.0	0.10-0.15	6.1-7.8	<2	Low--------	0.24			
	42-80	1-10	1.50-1.65	6.0-20	0.02-0.05	6.1-8.4	<2	Low--------	0.10			
16---------------- Felda	0-22	1-3	1.40-1.55	6.0-20	0.02-0.05	5.1-7.8	<2	Low--------	0.10	5	2	1-4
	22-65	13-30	1.50-1.65	0.6-6.0	0.10-0.15	6.1-7.8	<2	Low--------	0.24			
	65-80	1-10	1.50-1.65	6.0-20	0.02-0.05	6.1-7.8	<2	Low--------	0.10			
17---------------- Felda	0-32	1-3	1.45-1.55	6.0-20	0.02-0.05	5.1-7.8	<2	Low--------	0.10	4	2	1-4
	32-49	13-30	1.50-1.60	0.6-6.0	0.10-0.15	6.1-7.8	<2	Low--------	0.24			
	49-80	1-10	1.50-1.65	6.0-20	0.02-0.05	6.1-8.4	<2	Low--------	0.17			
18---------------- Floridana	0-22	3-10	1.40-1.50	6.0-20	0.10-0.20	4.5-8.4	<2	Low--------	0.10	5	2	6-15
	22-34	1-7	1.50-1.55	6.0-20	0.05-0.10	4.5-8.4	<2	Low--------	0.10			
	34-45	15-30	1.60-1.70	<0.2	0.10-0.20	4.5-8.4	<2	Low--------	0.24			
	45-80	1-10	1.50-1.65	6.0-20	0.02-0.05	4.5-8.4	<2	Low--------	0.17			
19---------------- Gator	0-22	0-1	0.10-0.30	6.0-20	0.30-0.40	3.6-6.0	<2	Low--------	----	---	2	55-85
	22-80	13-20	1.60-1.70	<0.2	0.10-0.15	6.1-8.4	<2	Low--------	0.32			
20---------------- Immokalee	0-5	1-5	1.20-1.50	6.0-20	0.05-0.10	3.6-6.0	<2	Low--------	0.10	5	2	1-2
	5-43	1-5	1.45-1.70	6.0-20	0.02-0.05	3.6-6.0	<2	Low--------	0.10			
	43-65	2-7	1.30-1.60	0.6-2.0	0.10-0.25	3.6-6.0	<2	Low--------	0.15			
	65-80	1-5	1.40-1.60	6.0-20	0.02-0.05	3.6-6.0	<2	Low--------	0.10			
21---------------- Malabar	0-12	0-4	1.35-1.55	6.0-20	0.03-0.08	5.1-8.4	<2	Low--------	0.10	5	2	1-2
	12-50	1-5	1.35-1.70	6.0-20	0.05-0.10	5.1-8.4	<2	Low--------	0.10			
	50-80	12-25	1.55-1.75	<0.2	0.10-0.15	5.1-8.4	<2	Low--------	0.24			
22---------------- Malabar	0-18	0-4	1.35-1.55	6.0-20	0.03-0.08	5.1-6.5	<2	Low--------	0.10	5	2	1-2
	18-40	1-5	1.35-1.70	6.0-20	0.05-0.10	5.1-7.3	<2	Low--------	0.10			
	40-52	1-3	1.40-1.70	6.0-20	0.03-0.05	5.1-7.3	<2	Low--------	0.10			
	52-80	12-25	1.55-1.75	<0.2	0.10-0.15	5.1-7.3	<2	Low--------	0.24			

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	Salinity	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm					Pct
23-------------- Malabar	0-25	0-4	1.20-1.55	6.0-20	0.03-0.08	5.1-8.4	<2	Low--------	0.10	5	2	1-2
	25-51	1-5	1.35-1.70	6.0-20	0.05-0.10	5.1-8.4	<2	Low--------	0.10			
	51-80	12-25	1.55-1.75	<0.2	0.10-0.15	5.1-8.4	<2	Low--------	0.24			
24-------------- Myakka	0-22	<2	1.35-1.55	6.0-20	0.02-0.05	3.6-6.5	<2	Low--------	0.10	5	2	<2
	22-28	1-8	1.45-1.60	0.6-6.0	0.10-0.20	3.6-6.5	<2	Low--------	0.15			
	28-80	<2	1.48-1.70	6.0-20	0.02-0.10	3.6-6.5	<2	Low--------	0.10			
25-------------- Ona	0-5	1-7	1.40-1.55	6.0-20	0.10-0.15	3.6-6.0	<2	Low--------	0.10	5	2	1-5
	5-20	3-8	1.50-1.65	0.6-2.0	0.10-0.15	3.6-6.0	<2	Low--------	0.15			
	20-46	1-4	1.50-1.65	6.0-20	0.03-0.08	3.6-6.0	<2	Low--------	0.10			
	46-80	3-8	1.50-1.65	0.6-2.0	0.10-0.15	3.6-6.0	<2	Low--------	0.15			
26-------------- Pineda	0-3	1-6	1.25-1.60	6.0-20	0.05-0.10	4.5-7.3	<2	Low--------	0.10	5	2	.5-6
	3-28	1-8	1.40-1.70	6.0-20	0.02-0.05	4.5-7.3	<2	Low--------	0.10			
	28-41	10-25	1.50-1.70	<0.2	0.10-0.15	5.1-8.4	<2	Low--------	0.24			
	41-80	3-12	1.45-1.60	2.0-6.0	0.02-0.05	5.6-8.4	<2	Low--------	0.10			
27-------------- Pineda	0-24	1-8	1.30-1.60	6.0-20	0.02-0.05	4.5-7.3	<2	Low--------	0.10	5	2	.5-6
	24-37	10-25	1.50-1.70	<0.2	0.10-0.15	5.1-8.4	<2	Low--------	0.24			
	37-80	3-12	1.45-1.60	2.0-6.0	0.02-0.05	5.6-8.4	<2	Low--------	0.10			
28-------------- Pineda	0-38	1-8	1.30-1.60	6.0-20	0.02-0.05	4.5-7.3	<2	Low--------	0.10	5	2	.5-6
	38-80	10-25	1.50-1.70	<0.2	0.10-0.15	5.1-8.4	<2	Low--------	0.24			
29:												
Pineda----------	0-5	1-6	1.25-1.60	6.0-20	0.05-0.10	4.5-7.3	<2	Low--------	0.10	5	2	.5-6
	5-31	1-8	1.40-1.70	6.0-20	0.02-0.05	4.5-7.3	<2	Low--------	0.10			
	31-70	10-25	1.50-1.70	<0.2	0.10-0.15	5.1-8.4	<2	Low--------	0.24			
	70-80	3-12	1.45-1.60	2.0-6.0	0.02-0.05	5.6-8.4	<2	Low--------	0.10			
Pinellas--------	0-20	1-3	1.15-1.50	6.0-20	0.02-0.05	5.6-7.8	<2	Low--------	0.10	5	2	1-4
	20-30	3-8	1.40-1.60	6.0-20	0.10-0.15	6.6-9.0	<2	Low--------	0.17			
	30-42	13-30	1.50-1.65	0.6-2.0	0.10-0.15	6.6-9.0	<2	Low--------	0.24			
	42-80	2-8	1.55-1.65	6.0-20	0.02-0.05	7.9-8.4	<2	Low--------	0.10			
30-------------- Pomello	0-46	<2	1.35-1.65	>20	0.02-0.05	4.5-6.0	<2	Low--------	0.10	5	1	<1
	46-59	<2	1.45-1.60	2.0-6.0	0.10-0.30	4.5-6.0	<2	Low--------	0.15			
	59-80	<2	1.35-1.65	6.0-20	0.02-0.05	4.5-6.0	<2	Low--------	0.10			
31-------------- Pompano	0-80	0-5	1.30-1.65	6.0-20	0.02-0.05	4.5-7.8	<2	Low--------	0.10	5	2	1-5
32-------------- Punta	0-3	0-4	1.35-1.50	6.0-20	0.05-0.10	4.5-6.0	<2	Low--------	0.10	5	2	1-4
	3-60	0-3	1.50-1.65	6.0-20	0.02-0.05	4.5-6.0	<2	Low--------	0.10			
	60-80	3-8	1.45-1.65	0.6-2.0	0.05-0.10	3.6-5.5	<2	Low--------	0.15			
33. Quartzipsamments												
34-------------- Samsula	0-19	---	0.25-0.50	6.0-20	0.20-0.25	3.6-5.5	<2	Low--------	----	2	2	>20
	19-80	1-14	1.35-1.55	6.0-20	0.02-0.05	3.6-5.5	<2	Low--------	0.17			
35-------------- Satellite	0-4	1-3	1.10-1.45	>20	0.02-0.10	4.5-7.8	<2	Low--------	0.10	5	2	.5-2
	4-80	0-2	1.35-1.55	>20	0.02-0.05	4.5-7.8	<2	Low--------	0.10			
36-------------- Smyrna	0-12	1-6	1.35-1.45	6.0-20	0.03-0.07	3.6-7.3	<2	Low--------	0.10	5	2	1-5
	12-15	3-8	1.35-1.45	0.6-6.0	0.10-0.20	3.6-7.3	<2	Low--------	0.15			
	15-37	1-6	1.50-1.65	6.0-20	0.03-0.07	3.6-6.5	<2	Low--------	0.10			
	37-80	3-8	1.35-1.45	0.6-6.0	0.10-0.20	3.6-7.3	<2	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	Salinity	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH	mmhos/cm					Pct
37---------------- Tavares	0-6	0-4	1.25-1.60	>6.0	0.05-0.10	3.6-6.5	<2	Low--------	0.10	5	2	.5-2
	6-80	0-4	1.40-1.70	>6.0	0.02-0.05	3.6-6.5	<2	Low--------	0.10			
38---------------- Terra Ceia	0-58	---	0.15-0.35	6.0-20	0.30-0.50	4.5-8.4	<2	Low--------	----	---	2	60-90
	58-80	2-10	1.35-1.50	6.0-20	0.02-0.08	4.5-8.4	<2	Low--------	----			
39---------------- Terra Ceia	0-72	---	0.15-0.35	6.0-20	0.30-0.50	7.9-8.4	<2	Low--------	----	2	2	>60
	72-80	---	---	---	---	---	---	----------	----	---	---	---
40---------------- Valkaria	0-6	1-3	1.35-1.50	6.0-20	0.05-0.10	4.5-7.3	<2	Low--------	0.10	5	2	1-4
	6-25	0-2	1.45-1.60	6.0-20	0.03-0.08	4.5-7.3	<2	Low--------	0.10			
	25-31	2-5	1.45-1.60	6.0-20	0.05-0.10	4.5-7.3	<2	Low--------	0.10			
	31-80	1-5	1.45-1.60	6.0-20	0.03-0.08	5.1-8.4	<2	Low--------	0.10			
41---------------- Wabasso	0-26	1-5	1.25-1.45	6.0-20	0.03-0.08	3.6-6.5	<2	Low--------	0.10	5	2	1-4
	26-31	1-12	1.50-1.75	0.6-2.0	0.10-0.15	3.6-6.5	<2	Low--------	0.15			
	31-80	12-30	1.60-1.80	<0.2	0.10-0.15	5.1-8.4	<2	Low--------	0.24			
42---------------- Zolfo	0-5	1-5	1.40-1.55	6.0-20	0.10-0.15	4.5-7.3	<2	Low--------	0.10	5	2	.5-1
	5-59	1-5	1.50-1.60	6.0-20	0.03-0.10	4.5-7.3	<2	Low--------	0.10			
	59-80	1-5	1.50-1.70	0.6-2.0	0.10-0.25	3.6-6.5	<2	Low--------	0.15			

TABLE 17.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "frequent," "brief," and "apparent" are explained in the text. 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: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months	Subsidence: Initial	Subsidence: Total	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
					Ft			In	In		
2------------- Anclote	D	None-------	---	---	+2-0	Apparent	Jun-Feb	---	---	High-----	Moderate.
3------------- Basinger	B/D	None-------	---	---	0-1.0	Apparent	Jun-Feb	---	---	High-----	Moderate.
4------------- Basinger	D	Frequent---	Long---	Jul-Sep	0-1.0	Apparent	Jun-Feb	---	---	High-----	Moderate.
5------------- Basinger	D	None-------	---	---	+2-0	Apparent	Jun-Feb	---	---	High-----	Moderate.
6------------- Bradenton	B/D	None-------	---	---	0-1.0	Apparent	Jun-Dec	---	---	High-----	Low.
7:											
Bradenton-------	D	Occasional	Brief--	Jun-Nov	0-1.0	Apparent	Jun-Dec	---	---	High-----	Low.
Felda-----------	B/D	Occasional	Brief--	Jul-Feb	0-1.0	Apparent	Jul-Mar	---	---	High-----	Moderate.
Chobee----------	D	Occasional	Long---	Jun-Feb	+2-0	Apparent	Jun-Feb	---	---	High-----	High.
8:											
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	Jul-Mar	---	---	High-----	Moderate.
Chobee----------	B/D	Frequent---	Very long.	Jun-Feb	0-1.0	Apparent	Jun-Feb	---	---	Moderate	Low.
9------------- Cassia	C	None-------	---	---	1.5-3.5	Apparent	Jul-Jan	---	---	Moderate	High.
10------------- Chobee	D	None-------	---	---	+2-0	Apparent	Jun-Feb	---	---	High-----	High.
11------------- Delray	D	None-------	---	---	+2-0	Apparent	Jun-Feb	---	---	Moderate	Low.
12:											
Durbin----------	D	Frequent---	Very long.	Jan-Dec	0-0.5	Apparent	Jan-Dec	12-14	15-24	High-----	High.
Wulfert---------	D	Frequent---	Very long.	Jan-Dec	0-0.5	Apparent	Jan-Dec	16-18	24-36	High-----	High.
13------------- EauGallie	B/D	None-------	---	---	0-1.0	Apparent	Jun-Oct	---	---	High-----	Moderate.
14------------- Farmton	B/D	None-------	---	---	0-1.0	Apparent	Jun-Oct	---	---	High-----	High.
15------------- Felda	B/D	None-------	---	---	0-1.0	Apparent	Jul-Mar	---	---	High-----	Moderate.

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		
16------------- Felda	B/D	Frequent---	Brief--	Jul-Feb	0-1.0	Apparent	Jul-Mar	---	---	High-----	Moderate.
17------------- Felda	D	None-------	---	---	+2-0	Apparent	Jun-Feb	---	---	High-----	High.
18------------- Floridana	D	None-------	---	---	+2-0	Apparent	Jun-Feb	---	---	Moderate	Low.
19------------- Gator	D	None-------	---	---	+2-0	Apparent	Jan-Dec	6-14	20-23	High-----	High.
20------------- Immokalee	B/D	None-------	---	---	0-1.0	Apparent	Jun-Nov	---	---	High-----	High.
21------------- Malabar	B/D	None-------	---	---	0-1.0	Apparent	Jun-Nov	---	---	High-----	Low.
22------------- Malabar	B/D	None-------	---	---	0-1.0	Apparent	Jun-Oct	---	---	High-----	Low.
23------------- Malabar	D	None-------	---	---	+2-0	Apparent	Jun-Feb	---	---	High-----	Low.
24------------- Myakka	B/D	None-------	---	---	0-1.0	Apparent	Jun-Nov	---	---	High-----	High.
25------------- Ona	B/D	None-------	---	---	0-1.0	Apparent	Jun-Nov	---	---	High-----	High.
26------------- Pineda	B/D	None-------	---	---	0-1.0	Apparent	Jun-Nov	---	---	High-----	Low.
27------------- Pineda	B/D	Frequent---	Brief--	Jul-Feb	0-1.0	Apparent	Jun-Nov	---	---	High-----	Low.
28------------- Pineda	D	None-------	---	---	+2-0	Apparent	Jun-Feb	---	---	High-----	Low.
29:											
Pineda----------	B/D	None-------	---	---	0-1.0	Apparent	Jun-Nov	---	---	High-----	Low.
Pinellas--------	B/D	None-------	---	---	0-1.0	Apparent	Jun-Nov	---	---	High-----	Low.
30------------- Pomello	C	None-------	---	---	2.0-3.5	Apparent	Jul-Nov	---	---	Low------	High.
31------------- Pompano	B/D	None-------	---	---	0-1.0	Apparent	Jun-Nov	---	---	High-----	Moderate.
32------------- Punta	B/D	None-------	---	---	0-1.0	Apparent	Jun-Nov	---	---	High-----	High.
33. Quartzipsamments											
34------------- Samsula	B/D	None-------	---	---	+2-0	Apparent	Jan-Dec	16-20	30-36	High-----	High.
35------------- Satellite	C	None-------	---	---	1.0-3.5	Apparent	Jun-Nov	---	---	Low------	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		
36----------------- Smyrna	B/D	None--------	---	---	0-1.0	Apparent	Jul-Oct	---	---	High------	High.
37----------------- Tavares	A	None--------	---	---	3.5-6.0	Apparent	Jun-Dec	---	---	Low-------	High.
38----------------- Terra Ceia	D	None--------	---	---	+2-0	Apparent	Jan-Dec	16-20	50-60	Moderate	Moderate.
39----------------- Terra Ceia	D	Frequent----	Long---	Jun-Nov	0-1.0	Apparent	Jan-Dec	16-20	50-60	Moderate	Moderate.
40----------------- Valkaria	B/D	None--------	---	---	0-1.0	Apparent	Jun-Sep	---	---	High------	Moderate.
41----------------- Wabasso	B/D	None--------	---	---	0-1.0	Apparent	Jun-Oct	---	---	Moderate	High.
42----------------- Zolfo	C	None--------	---	---	2.0-3.5	Apparent	Jun-Nov	---	---	Low-------	Moderate.

TABLE 18.--DEPTH TO WATER TABLE IN SELECTED SOILS

[Readings were taken monthly. Absence of an entry indicates that readings were not taken that month. Measurements are in inches below the surface. A # indicates water table is more than 80 inches below the surface. An x indicates the mean was not calculated]

Map symbol and soil name	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		Inches											
14------------------ Farmton	1983	---	---	6	16	30	24	16	16	---	27	29	18
	1984	20	---	3	---	22	46	10	22	15	38	42	33
	1985	---	---	42	---	36	38	27	11	18	3	20	---
	mean	x	x	17	x	30	36	18	17	17	23	30	x
20------------------ Immokalee	1983	---	---	10	25	38	30	33	22	9	29	32	27
	1984	35	---	5	28	31	42	27	33	35	---	---	---
	1985	---	---	---	---	---	---	---	---	---	---	---	---
	mean	x	x	18	27	35	36	30	28	22	x	x	x
26------------------ Pineda	1983	---	---	0	12	36	31	23	0	0	21	17	12
	1984	14	---	0	1	0	36	0	11	19	38	46	26
	1985	---	---	40	---	45	38	3	0	8	0	21	---
	mean	x	x	14	7	27	35	9	4	9	20	28	x
30------------------ Pomello	1983	---	---	20	33	46	52	53	67	57	61	67	69
	1984	74	---	45	56	---	66	65	53	67	78	78	77
	1985	---	---	#	---	#	#	#	#	76	76	#	---
	mean	x	x	x	45	x	x	x	x	67	72	x	x
32------------------ Punta	1983	---	---	8	19	32	26	32	13	0	18	17	12
	1984	24	---	0	13	25	44	32	22	30	49	50	52
	1985	---	---	58	---	70	70	58	24	22	28	32	---
	mean	x	x	22	16	43	47	41	20	18	32	33	x
36------------------ Smyrna	1983	---	---	3	22	41	30	31	15	1	28	24	16
	1984	17	---	0	22	35	39	3	25	36	51	50	44
	1985	---	---	52	---	45	50	53	33	38	19	30	---
	mean	x	x	19	22	41	40	29	25	25	33	35	x
37------------------ Tavares	1983	---	---	56	65	76	68	57	48	49	56	64	58
	1984	63	---	43	60	67	#	66	67	72	---	---	---
	1985	---	---	---	---	---	---	---	---	---	---	---	---
	mean	x	x	50	63	72	x	62	53	61	x	x	x
42------------------ Zolfo	1983	---	---	24	43	39	38	43	30	38	44	42	40
	1984	44	---	26	47	49	54	27	43	45	---	---	---
	1985	---	---	---	---	---	---	---	---	---	---	---	---
	mean	x	x	25	45	44	46	35	37	42	x	x	x

TABLE 19.--PHYSICAL ANALYSES OF SELECTED SOILS

[Some of this data is slightly outside the properties given in table 16. The original concept has not been changed at this time because of the small amount of data available]

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										Cm/hr	G/cm	-----Pct (wt)	----	
Basinger fine sand:															
S84FL-027-06-1	0-13	Ap	0.0	1.4	13.6	70.3	11.7	97.0	1.1	1.9	10.4	1.46	13.6	8.9	4.1
-2	13-56	E	0.0	1.2	13.1	72.3	12.2	98.8	0.4	0.8	21.5	1.65	3.4	1.8	1.1
-3	56-76	E/Bh	0.0	1.3	12.6	72.2	12.2	98.3	1.1	0.6	22.4	1.66	3.8	1.8	0.7
-4	76-137	Bh	0.0	1.4	12.9	72.0	11.6	97.9	1.1	1.0	21.0	1.65	4.6	2.2	0.6
-5	137-203	C	0.0	1.6	13.1	72.3	11.5	98.5	0.7	0.8	21.7	1.68	3.7	2.0	1.2
Bradenton fine sand:															
S85FL-027-13-1	0-10	Ap	0.0	0.9	7.9	66.4	18.9	94.1	2.9	3.0	6.9	1.41	14.9	9.2	3.6
-2	10-23	E1	0.0	1.0	8.0	67.0	18.0	94.0	4.0	2.0	5.3	1.56	10.1	5.5	2.0
-3	23-38	E2	0.0	0.8	7.3	68.0	16.9	93.0	2.8	4.2	4.1	1.62	8.7	5.4	2.2
-4	38-66	Btg	0.0	0.9	7.4	62.0	16.9	87.2	4.1	8.7	1.2	1.69	12.7	9.2	3.4
-5	66-86	Cg1	0.0	0.8	7.4	60.1	16.6	84.9	4.4	10.7	0.2	1.59	19.5	16.4	5.5
-6	86-147	Cg2	0.0	0.9	7.4	62.7	17.0	88.0	3.8	8.2	0.0	1.71	16.4	13.7	4.0
-7	147-203	Cg3	0.0	0.9	7.3	60.9	14.3	83.4	4.4	12.2	0.1	1.65	21.3	19.1	9.6
Chobee muck:															
S85FL-027-16-1	0-5	Oa	---	---	---	---	---	---	---	---	408.0	0.45	119.7	101.3	34.0
-2	5-18	A	0.3	2.6	18.5	38.8	10.9	71.1	7.0	21.9	208.0	1.27	33.2	29.2	12.0
-3	18-68	Bt	0.2	2.0	16.6	36.5	10.8	66.1	9.7	24.2	1.1	1.29	33.9	31.2	13.5
-4	68-119	Bt	0.2	2.1	15.4	33.7	10.5	61.9	10.3	27.8	2.6	1.33	33.4	31.0	13.4
-5	119-165	Btg	1.2	3.4	20.8	42.0	9.2	76.6	5.2	18.2	2.1	1.63	20.0	17.0	8.7
-6	165-203	Cg	2.8	5.6	19.4	61.8	2.0	91.6	1.8	6.6	0.6	1.60	15.4	11.5	4.6
EauGallie fine sand:															
S84FL-027-11-1	0-18	Ap	0.0	1.4	16.5	60.0	19.4	97.3	0.5	2.2	44.0	1.03	29.2	21.0	7.9
-2	18-36	E1	0.0	1.2	13.2	61.2	20.9	96.5	2.9	0.6	15.8	1.51	7.3	3.7	1.5
-3	36-74	E2	0.0	1.2	13.1	62.1	21.1	97.5	1.9	0.6	21.0	1.61	5.0	1.9	1.0
-4	74-81	Bh1	0.0	1.4	12.8	57.8	19.5	91.5	4.8	3.7	22.4	1.60	15.6	10.5	2.2
-5	81-119	Bh2	0.0	1.2	12.3	61.2	21.2	95.9	2.6	1.5	12.3	1.66	9.6	5.0	0.8
-6	119-173	BE	0.0	1.3	12.4	59.9	21.1	94.7	2.9	2.4	7.1	1.66	15.2	9.0	1.7
-7	173-190	Btg1	0.1	1.3	10.7	56.8	15.1	84.0	3.0	13.0	0.5	1.80	14.5	12.2	3.9
-8	190-203	Btg2	0.0	0.8	10.0	53.5	11.8	76.1	2.1	21.8	0.1	1.86	15.1	13.3	7.2

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										Cm/hr	G/cm	pct (wt)	pct (wt)	pct (wt)
Farmton fine sand:															
S82FL-027-01-1	0-10	A	0.0	1.0	10.7	73.6	12.7	98.0	1.8	0.2	30.9	1.28	11.2	8.3	1.5
-2	10-36	E1	0.0	1.2	11.1	75.0	10.9	98.2	1.0	0.8	29.6	1.38	5.7	4.3	0.4
-3	36-86	E2	0.0	1.2	10.4	75.2	12.2	99.0	0.2	0.8	23.7	1.57	3.7	2.7	0.1
-4	86-91	Bh1	0.0	1.2	10.3	72.4	11.4	95.3	4.6	0.1	3.4	1.67	9.1	6.1	1.3
-5	91-102	Bh2	0.0	1.2	9.8	73.2	12.0	96.2	1.7	2.1	5.2	1.65	9.5	6.1	1.3
-6	102-122	Bh3	0.0	1.3	9.7	73.0	12.2	96.2	1.6	2.2	7.6	1.65	8.5	4.8	1.2
-7	122-157	Btg1	0.0	0.7	7.6	60.1	9.1	77.5	1.4	21.1	9.4	1.59	22.3	21.3	9.2
-8	157-168	Btg2	0.0	0.7	6.7	60.5	9.9	77.8	1.4	20.8	0.2	1.74	16.1	14.4	8.7
Immokalee fine sand:															
S82FL-027-05-1	0-13	A	0.0	0.7	8.8	77.5	10.2	97.2	2.5	0.3	15.8	1.18	13.6	9.8	3.6
-2	13-109	E	0.0	0.9	7.8	78.9	11.1	98.7	0.8	0.5	20.4	1.44	4.3	3.3	1.1
-3	109-119	Bh1	0.0	0.9	6.8	70.6	10.4	88.7	5.5	5.8	0.2	1.37	26.6	22.7	6.0
-4	119-140	Bh2	0.0	0.8	6.4	71.2	10.3	88.7	4.7	6.6	5.0	1.36	18.9	16.0	5.5
-5	140-165	C	0.0	0.8	5.5	72.8	8.4	87.5	2.6	9.9	1.9	1.49	15.7	12.1	4.5
Malabar fine sand:															
S84FL-027-10-1	0-15	A	0.0	1.3	15.6	67.8	13.8	98.5	0.6	0.9	35.1	1.50	7.8	4.6	2.0
-2	15-30	E	0.0	2.4	13.2	69.2	13.8	98.6	0.8	0.6	21.0	1.65	5.0	2.2	0.6
-3	30-58	Bw1	0.0	2.4	13.4	66.5	15.9	98.2	1.3	0.5	28.3	1.61	3.9	2.1	0.7
-4	58-76	Bw2	0.0	2.5	14.2	67.2	13.3	97.2	1.9	0.9	11.5	1.70	5.1	2.3	0.4
-5	76-127	Bw3	0.0	2.5	12.9	67.2	14.8	97.4	1.8	0.8	11.6	1.74	4.5	2.0	0.4
-6	127-203	Btg	0.0	1.7	10.6	57.3	11.9	81.5	2.0	16.5	6.6	1.72	18.8	17.0	5.9
Ona fine sand:															
S85FL-027-18-1	0-13	Ap	0.0	0.6	7.7	72.2	15.2	95.7	0.9	3.4	19.4	1.22	19.3	12.5	3.8
-2	13-51	Bh	0.0	0.4	6.7	72.4	15.6	95.1	1.9	3.0	17.4	1.44	9.8	5.6	1.5
-3	51-79	BE	0.0	0.5	7.2	73.2	14.4	95.3	2.4	2.3	17.7	1.56	6.9	4.5	0.9
-4	79-117	E	0.0	0.5	7.1	73.0	15.6	96.2	2.1	1.7	14.0	1.62	6.4	3.8	0.7
-5	117-203	B'h	0.0	0.4	6.5	72.1	15.4	94.4	4.2	1.4	6.9	1.52	15.9	10.1	1.5
Pomello fine sand:															
S82FL-027-04-1	0-15	Ap	0.0	3.1	20.7	67.1	8.1	99.0	0.7	0.3	22.4	1.33	9.4	7.3	2.9
-2	15-66	E	0.0	3.2	20.1	66.5	9.0	98.8	0.4	0.8	27.6	1.61	4.2	3.4	0.4
-3	66-117	E	0.0	3.9	18.8	67.2	9.1	99.0	0.2	0.8	28.2	1.49	4.4	4.0	0.8
-4	117-122	Bh1	0.0	4.6	19.2	62.8	8.1	94.7	2.1	3.2	15.8	1.40	6.6	3.6	0.7
-5	122-132	Bh2	0.1	4.7	18.3	62.3	8.5	93.9	2.4	3.7	11.8	1.35	13.3	10.0	2.9
-6	132-150	BC1	0.1	5.1	20.8	63.2	7.6	96.8	0.7	2.5	24.3	1.44	7.7	5.5	1.4
-7	150-168	BC2	0.0	4.7	21.4	64.0	7.7	97.8	0.6	1.6	22.4	1.51	5.5	3.7	0.8
-8	168-203	C	0.0	4.6	17.7	62.8	13.0	98.1	0.6	1.3	25.0	1.58	3.4	2.2	0.3

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										Cm/hr	G/cm	-----pct (wt)----		
Pompano fine sand:															
S84FL-027-09-1	0-13	A	0.0	0.4	11.2	70.6	16.3	98.5	0.1	1.4	59.8	1.30	22.1	15.6	4.2
-2	13-30	Cg1	0.0	1.4	13.1	69.9	14.2	98.6	0.7	0.7	23.7	1.54	6.3	3.6	1.6
-3	30-74	Cg2	0.0	2.2	13.5	68.5	14.1	98.3	1.5	0.2	27.9	1.67	3.9	1.6	0.5
-4	74-155	Cg3	0.0	1.1	10.9	68.5	14.5	95.0	2.1	2.9	12.5	1.73	5.8	2.6	0.7
-5	155-203	Cg4	0.1	6.3	39.3	50.8	2.8	99.3	0.1	0.6	45.0	1.62	8.9	7.5	1.0
Samsula muck:															
S84FL-027-07-1	0-33	Oa1	---	---	---	---	---	---	---	---	131.0	0.32	207.1	184.2	26.9
-2	33-48	Oa2	---	---	---	---	---	---	---	---	131.0	0.23	302.3	231.0	20.5
-3	48-58	C	0.0	1.5	15.7	72.7	8.8	98.7	0.1	1.2	41.7	1.40	16.4	9.6	2.3
-4	58-203	Cg	0.0	1.9	15.6	70.0	10.6	98.1	1.5	0.4	25.6	1.62	3.4	2.2	1.1
Satellite fine sand:															
S85FL-027-15-1	0-10	A	0.0	1.8	16.9	63.6	15.3	97.6	1.4	1.0	43.1	1.29	8.7	5.8	2.1
-2	10-102	C	0.0	1.8	14.2	66.9	15.7	98.6	1.2	0.2	26.6	1.60	3.4	2.3	0.6
-3	102-203	C	0.0	2.0	14.4	65.9	16.3	98.6	1.1	0.3	27.6	1.59	3.7	2.5	0.4
Smyrna fine sand:															
S85FL-027-12-1	0-15	Ap	0.0	3.3	13.8	65.7	13.0	95.8	2.7	1.5	10.7	1.31	15.3	10.3	5.0
-2	15-30	E	0.0	3.1	12.4	69.6	12.8	97.9	1.7	0.4	21.3	1.53	5.0	2.5	1.2
-3	30-38	Bh	0.0	2.6	11.7	67.5	13.4	95.2	1.7	3.1	16.2	1.29	23.7	18.1	5.1
-4	38-48	BE	0.0	2.9	11.6	67.7	13.2	95.4	1.6	3.0	29.6	1.40	13.3	9.3	3.0
-5	48-94	E'	0.0	2.9	11.5	68.8	14.1	97.3	1.7	1.0	19.1	1.65	4.6	2.2	0.5
-6	94-145	B'h1	0.0	2.9	11.0	67.4	13.0	94.3	4.1	1.6	1.6	1.56	10.8	8.2	1.1
-7	145-188	B'h2	0.0	3.2	10.3	70.5	11.5	95.5	3.8	0.7	3.5	1.51	18.8	13.0	1.5
-8	188-203	B'h3	0.0	3.4	11.0	69.4	10.4	94.2	4.2	1.6	1.5	1.57	14.8	10.7	2.1
Tavares fine sand:															
S82FL-027-03-1	0-15	Ap	0.0	1.4	13.7	67.6	14.4	97.1	2.2	0.7	13.1	1.60	6.5	4.2	0.8
-2	15-28	C1	0.0	1.2	11.8	68.4	14.8	96.2	2.0	1.8	20.0	1.61	6.8	4.3	0.6
-3	28-58	C2	0.0	1.1	12.0	67.7	15.2	96.0	2.2	1.8	27.6	1.49	5.5	3.5	0.5
-4	58-91	C2	0.0	1.1	10.9	67.6	16.3	95.9	2.4	1.7	28.9	1.45	5.9	4.0	0.5
-5	91-137	C3	0.0	1.1	11.3	68.3	15.9	96.6	1.8	1.6	26.3	1.63	5.9	3.6	0.3
-6	137-170	C4	0.0	1.2	11.6	69.3	15.3	97.4	1.5	1.1	23.7	1.47	6.5	4.5	0.2
-7	170-203	C4	0.0	1.1	11.7	69.7	15.0	97.5	1.4	1.1	22.4	1.45	6.7	4.5	0.1
Valkaria fine sand:															
S84FL-027-08-1	0-15	Ap	0.0	0.4	9.4	73.8	12.8	96.4	2.0	1.6	40.1	1.36	13.7	9.2	3.3
-2	15-51	E1	0.1	1.1	9.1	73.2	13.9	97.4	1.7	0.9	18.4	1.60	5.3	2.9	1.1
-3	51-63	E2	0.0	1.0	8.8	75.2	13.1	98.1	1.2	0.7	25.0	1.58	3.9	1.9	0.8
-4	63-79	Bw	0.0	1.1	9.6	72.9	13.2	96.8	2.2	1.0	20.4	1.63	4.8	2.2	0.2
-5	79-173	C1	0.0	0.9	9.6	74.1	13.1	97.7	1.7	0.6	22.0	1.63	4.7	2.1	0.4
-6	173-203	C2	0.0	1.4	8.7	74.6	9.1	93.8	1.6	4.6	5.0	1.68	7.2	3.7	0.5

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										Cm/hr	G/cm	pct (wt)	pct (wt)	pct (wt)
Wabasso sand:															
S85FL-027-17-1	0-18	A	0.1	3.0	31.2	49.8	11.3	95.4	3.3	1.3	41.2	1.10	20.2	15.1	6.4
-2	18-36	E1	0.1	3.3	25.9	53.2	13.4	95.9	3.4	0.7	16.7	1.49	7.0	4.1	1.5
-3	36-53	E2	0.3	4.0	23.3	54.6	14.6	96.8	2.9	0.3	21.0	1.58	5.2	2.8	0.8
-4	53-66	E3	0.3	3.9	22.8	55.1	14.9	97.0	2.5	0.5	24.3	1.64	4.2	2.0	0.6
-5	66-79	Bh	0.4	4.3	22.4	52.9	13.5	93.5	2.4	4.0	9.6	1.43	13.0	8.4	2.6
-6	79-94	Bt	0.3	3.3	19.8	41.4	10.6	75.4	5.1	19.5	4.2	1.56	20.2	17.1	9.8
-7	94-140	Btg1	0.3	2.7	19.2	42.2	10.8	75.2	5.0	19.8	0.1	1.76	15.8	13.0	7.1
-8	140-203	Btg2	0.4	1.7	17.8	41.0	6.8	67.7	6.9	25.4	0.1	1.51	23.8	21.1	13.0
Zolfo fine sand:															
S85FL-027-17-1	0-13	A	0.0	1.4	11.8	67.3	15.8	96.3	2.8	0.9	20.7	1.39	9.2	5.7	1.4
-2	13-36	E1	0.0	1.3	11.0	68.1	15.6	96.0	2.7	1.3	21.0	1.43	7.4	3.8	0.8
-3	36-114	E2	0.0	1.4	10.7	67.8	16.9	96.8	2.2	1.0	31.6	1.49	4.4	1.8	0.5
-4	114-150	E3	0.0	1.2	10.2	67.4	18.1	96.9	2.1	1.0	36.2	1.51	4.5	2.0	0.4
-5	150-170	Bh1	0.0	1.3	10.9	67.5	16.9	96.6	2.2	1.2	43.4	1.40	5.8	3.3	0.4
-6	170-203	Bh2	0.0	1.4	10.9	69.0	17.7	99.0	0.1	0.9	21.0	1.47	5.2	2.6	0.5

TABLE 20.--CHEMICAL ANAYLSES OF SELECTED SOILS

[Some of the data is slightly outside the properties given in table 16. The original concept has not changed at this time because of the small amount of data available]

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
Basinger fine sand:																				
S84FL-027-06-1	0-13	Ap	2.04	0.35	0.04	0.04	2.47	6.24	8.71	28	2.26	0.10	4.3	4.1	3.9	---	---	---	---	---
-2	13-56	E	0.13	0.04	0.02	0.00	0.19	0.39	0.58	33	0.08	0.03	5.0	5.0	5.3	---	---	---	---	---
-3	56-76	E/Bh	0.12	0.05	0.02	0.00	0.19	0.49	0.68	28	0.06	0.03	4.9	4.8	5.1	0.06	0.00	0.01	0.08	0.00
-4	76-137	Bh	0.20	0.06	0.02	0.00	0.28	0.51	0.79	35	0.07	0.03	5.3	4.8	5.1	0.13	0.00	0.02	0.03	0.01
-5	137-203	C	0.10	0.06	0.03	0.00	0.19	0.63	0.82	23	0.09	0.04	5.4	4.7	4.9	---	---	---	---	---
Bradenton fine sand:																				
S85FL-027-13-1	0-10	Ap	4.90	0.66	0.09	0.03	5.68	2.2	7.94	72	1.33	0.11	5.9	5.6	5.1	---	---	---	---	---
-2	10-23	E1	4.70	0.41	0.11	0.01	5.23	0.94	6.17	85	0.17	0.04	6.7	6.3	5.8	---	---	---	---	---
-3	23-38	E2	5.05	0.74	0.13	0.01	5.93	0.90	6.83	87	0.21	0.12	7.4	6.8	6.2	---	---	---	0.10	0.02
-4	38-66	Btg	9.20	1.52	0.17	0.02	10.91	2.12	13.03	84	0.05	0.10	7.8	7.1	6.2	---	---	---	0.25	0.03
-5	66-86	Cg1	10.50	1.65	0.16	0.02	12.33	2.74	15.07	82	0.07	0.06	7.6	6.8	6.1	---	---	---	0.98	0.04
-6	86-147	Cg2	8.50	1.36	0.11	0.03	10.00	2.11	12.11	83	0.07	0.01	7.3	6.6	6.0	---	---	---	---	---
-7	147-203	Cg3	14.75	2.06	0.14	0.09	17.04	3.52	20.56	83	0.08	0.07	8.2	7.6	6.7	---	---	---	0.08	0.02
Chobee muck:																				
S85FL-027-16-1	0-5	Oa	64.00	7.82	2.83	0.72	75.37	18.98	94.35	80	13.79	0.00	5.7	5.6	5.3	---	---	---	---	---
-2	5-18	A	22.50	2.80	0.21	0.09	25.60	10.64	36.24	71	3.07	0.00	5.6	5.2	4.8	---	---	---	---	---
-3	18-68	Bt	22.50	2.22	0.17	0.07	24.96	9.56	34.52	72	0.69	0.00	5.7	5.0	4.5	---	---	---	---	---
-4	68-119	Bt	28.75	2.34	0.17	0.07	31.33	10.62	41.95	75	0.72	0.04	5.7	4.9	4.6	---	---	---	0.07	0.06
-5	119-165	Btg	19.50	1.36	0.16	0.09	21.11	6.67	27.78	76	0.15	0.06	6.0	5.1	4.7	---	---	---	0.08	0.03
-6	165-203	Cg	6.22	0.49	0.06	0.08	6.85	2.33	9.18	75	0.17	0.36	5.6	5.4	5.0	---	---	---	0.11	0.02
EauGallie fine sand:																				
S84FL-027-11-1	0-18	Ap	3.29	0.94	0.07	0.21	4.51	12.37	16.88	27	5.86	---	3.8*	3.6	3.7	---	---	---	---	---
-2	18-36	E1	0.77	0.06	0.02	0.01	0.86	1.69	2.55	34	0.70	---	4.5	4.1	4.4	---	---	---	---	---
-3	36-74	E2	0.20	0.01	0.01	0.00	0.22	0.00	0.22	100	0.14	---	5.4	4.6	5.0	---	---	---	---	---
-4	74-81	Bh1	1.12	0.11	0.04	0.01	1.28	6.80	8.08	16	1.19	---	4.5	4.2	3.9	0.73	0.06	0.12	0.16	0.08
-5	81-119	Bh2	0.67	0.10	0.05	0.01	0.83	1.93	2.76	30	0.60	---	4.8	4.5	4.6	0.16	0.02	0.06	0.04	0.03
-6	119-173	BE	0.63	0.15	0.08	0.02	0.88	3.19	4.07	22	0.53	---	4.9	4.7	4.7	---	---	---	---	---
-7	173-190	Btg1	2.29	0.78	0.21	0.04	3.32	2.39	5.71	58	0.21	---	4.8	4.4	4.2	---	---	---	0.20	0.08
-8	190-203	Btg2	3.69	1.36	0.25	0.03	5.33	1.38	6.71	79	0.14	---	4.2*	4.0	3.7	---	---	---	0.10	0.05

See footnote at end of table.

TABLE 20.--CHEMICAL ANALYSES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Extractable bases: Ca	Extractable bases: Mg	Extractable bases: Na	Extractable bases: K	Extractable bases: Sum	Extractable acidity	Sum of cations	Base saturation	Organic carbon	Electrical conductivity	pH H_2O (1:1)	pH $CaCl_2$ 0.1m (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
Farmton fine sand:																				
S82FL-027-01-1	0-10	A	1.12	0.22	0.07	0.03	1.44	5.32	6.76	21	1.76	0.06	4.7	4.2	3.9	---	---	---	---	---
-2	10-36	E1	0.19	0.04	0.02	0.01	0.26	2.00	2.26	12	0.38	0.02	4.8	3.7	3.7	---	---	---	---	---
-3	36-86	E2	0.03	0.01	0.01	0.00	0.05	0.92	0.97	5	0.04	0.01	5.0	4.5	4.4	---	---	---	---	---
-4	86-91	Bh1	0.21	0.03	0.03	0.00	0.27	8.31	8.58	3	0.79	0.02	4.6	3.8	3.7	0.64	0.02	0.08	0.02	0.04
-5	91-102	Bh2	0.07	0.02	0.02	0.00	0.11	5.95	6.06	2	0.36	0.01	4.6	4.0	4.0	0.46	0.01	0.07	0.02	0.03
-6	102-122	Bh3	0.09	0.03	0.05	0.01	0.18	7.17	7.35	2	0.55	0.04	4.5	4.3	4.2	0.45	0.01	0.09	0.02	0.05
-7	122-157	Btg1	0.13	0.39	0.08	0.01	0.61	8.62	9.23	7	0.37	0.05	4.4	3.9	3.9	---	---	---	0.27	0.08
-8	157-168	Btg2	0.23	0.53	0.10	0.02	0.88	7.22	8.10	11	0.21	0.03	4.6	3.9	3.8	---	---	---	0.03	0.05
Immokalee fine sand:																				
S82FL-027-05-1	0-13	A	1.16	0.39	0.07	0.08	1.70	10.96	12.66	13	1.96	0.06	4.2	3.4	3.2	---	---	---	---	---
-2	13-109	E	0.03	0.02	0.01	0.00	0.06	0.62	0.68	9	0.06	0.01	5.0	4.4	4.1	---	---	---	---	---
-3	109-119	Bh1	0.13	0.14	0.05	0.00	0.32	28.65	28.97	1	2.80	0.05	4.0	3.4	3.3	2.07	0.01	0.17	0.01	0.14
-4	119-140	Bh2	0.07	0.07	0.03	0.00	0.17	35.67	35.84	---	2.36	0.03	4.2	3.7	3.5	1.99	0.01	0.35	0.02	0.30
-5	140-165	C	0.04	0.04	0.02	0.00	0.10	17.28	17.38	1	0.78	0.02	4.4	4.0	3.9	0.69	0.01	0.22	0.02	0.20
Malabar fine sand:																				
S84FL-027-10-1	0-15	A	0.46	0.13	0.05	0.02	0.66	1.41	2.07	32	0.60	0.05	4.6*	4.3	4.6	---	---	---	---	---
-2	15-30	E	0.18	0.06	0.03	0.00	0.27	0.52	0.79	34	0.09	0.06	5.1	4.9	5.2	---	---	---	---	---
-3	30-58	Bw1	0.10	0.04	0.02	0.00	0.16	0.01	0.17	94	0.04	0.05	5.4	5.2	5.5	---	---	---	---	---
-4	58-76	Bw2	0.15	0.05	0.03	0.00	0.23	0.21	0.44	52	0.02	0.04	5.2	5.1	5.4	---	---	---	---	---
-5	76-127	Bw3	0.18	0.05	0.05	0.00	0.28	0.37	0.65	43	0.07	0.11	4.2*	4.5	4.7	---	---	---	---	---
-6	127-203	Btg	2.50	1.09	0.15	0.02	3.76	4.94	8.70	43	0.02	0.08	3.8*	3.6	3.6	---	---	---	---	---
Ona fine sand:																				
S85FL-027-18-1	0-13	Ap	2.22	0.13	0.06	0.07	2.48	6.80	9.28	27	2.49	0.00	5.5	4.8	4.6	---	---	---	---	---
-2	13-51	Bh	0.85	0.24	0.03	0.01	1.13	6.54	7.67	15	1.16	0.00	5.7	4.9	4.5	0.62	0.05	0.20	0.10	0.13
-3	51-79	BE	0.09	0.09	0.03	0.01	0.22	4.27	4.49	5	0.48	0.01	5.6	4.8	4.5	---	---	---	---	---
-4	79-117	E	0.03	0.02	0.02	0.00	0.07	1.83	1.90	4	0.11	0.02	5.2	4.8	4.7	---	---	---	---	---
-5	117-203	B'h	0.07	0.02	0.04	0.00	0.13	6.88	7.01	2	0.68	0.04	5.1	4.9	4.6	0.44	0.02	0.24	0.06	0.14
Pomello fine sand:																				
S82FL-027-04-1	0-15	Ap	0.32	0.07	0.02	0.01	0.42	4.60	5.02	8	0.75	0.02	4.5	3.6	3.3	---	---	---	---	---
-2	15-66	E	0.10	0.02	0.01	0.00	0.13	1.14	1.27	10	0.11	0.01	4.9	4.1	3.9	---	---	---	---	---
-3	66-117	E	0.02	0.02	0.02	0.00	0.06	0.68	0.74	8	0.04	0.01	5.1	4.5	4.3	---	---	---	---	---
-4	117-122	Bh1	0.09	0.08	0.04	0.01	0.22	18.56	18.78	1	1.50	0.02	4.4*	3.7	3.5	1.03	0.01	0.18	0.02	0.14
-5	122-132	Bh2	0.06	0.05	0.04	0.01	0.16	20.82	20.98	1	1.71	0.02	4.5	4.0	3.8	1.16	0.01	0.26	0.02	0.21
-6	132-150	BC1	0.04	0.04	0.02	0.01	0.11	10.24	10.35	1	0.68	0.01	4.7	4.2	4.0	---	---	---	---	---
-7	150-168	BC2	0.03	0.02	0.03	0.00	0.08	4.94	5.02	2	0.30	0.01	4.8	4.3	4.1	---	---	---	---	---
-8	168-203	C	0.01	0.02	0.01	0.00	0.04	2.08	2.12	2	0.12	0.01	4.8	4.6	4.5	---	---	---	---	---

See footnote at end of table.

TABLE 20.--CHEMICAL ANALYSES 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
Pompano fine sand:																				
S84FL-027-09-1	0-13	A	0.59	0.12	0.18	0.04	0.93	7.08	8.01	12	2.41	0.05	3.7*	3.7	3.4	---	---	---	---	---
-2	13-30	Cg1	0.15	0.04	0.03	0.00	0.22	1.01	1.23	18	0.21	0.07	4.4*	4.3	4.2	---	---	---	---	---
-3	30-74	Cg2	0.10	0.02	0.02	0.00	0.14	0.17	0.31	45	0.08	0.02	5.6	5.2	4.9	---	---	---	---	---
-4	74-155	Cg3	0.67	0.18	0.05	0.01	0.91	1.81	2.72	33	0.12	0.05	5.3	5.1	4.8	---	---	---	---	---
-5	155-203	Cg4	0.13	0.04	0.02	0.00	0.19	0.00	0.19	100	0.02	0.04	5.8	5.6	5.4	---	---	---	---	---
Samsula muck:																				
S84FL-027-07-1	0-33	Oa1	14.25	7.82	1.50	0.39	23.96	94.13	118.09	20	37.66	0.78	3.8	3.8	3.8	---	---	---	---	---
-2	33-48	Oa2	8.00	4.32	0.96	0.03	13.31	83.00	96.31	14	25.56	0.61	3.8	3.8	3.8	---	---	---	---	---
-3	48-58	C	1.29	0.53	0.12	0.00	1.94	10.35	12.29	16	3.42	0.24	3.9	3.8	3.9	---	---	---	---	---
-4	58-203	Cg	0.11	0.08	0.03	0.00	0.22	0.28	0.50	44	0.07	0.02	4.5	4.7	4.8	---	---	---	---	---
Satellite fine sand:																				
S85FL-027-15-1	0-10	A	0.79	0.28	0.06	0.02	1.15	4.27	5.42	21	1.23	0.06	4.6	3.9	3.5	---	---	---	---	---
-2	10-102	C	0.04	0.02	0.01	0.00	0.07	0.34	0.41	17	0.02	0.01	5.2	4.5	4.0	---	---	---	---	---
-3	102-203	C	0.03	0.02	0.01	0.00	0.06	0.16	0.22	27	0.02	0.01	5.4	4.5	4.1	---	---	---	---	---
Smyrna fine sand:																				
S85FL-027-12-1	0-15	Ap	3.62	0.66	0.06	0.06	4.40	4.48	8.88	50	2.48	0.00	5.1	4.4	4.2	---	---	---	---	---
-2	15-30	E	0.37	0.05	0.01	0.00	0.43	0.74	1.17	37	0.18	0.00	6.6	4.9	4.7	---	---	---	---	---
-3	30-38	Bh	1.65	1.32	0.14	0.03	3.14	17.59	20.73	15	3.11	0.00	5.4	4.5	4.2	---	---	---	---	---
-4	38-48	BE	0.42	0.49	0.07	0.01	0.99	15.80	16.79	6	1.62	0.00	5.4	4.5	4.2	---	---	---	---	---
-5	48-94	E'	0.02	0.02	0.02	0.00	0.06	2.35	2.41	2	0.20	0.00	6.1	4.7	4.6	---	---	---	---	---
-6	94-145	B'h1	0.06	0.04	0.03	0.00	0.13	3.39	3.52	4	0.27	0.04	6.2	4.8	4.6	0.33	0.04	0.20	0.09	0.14
-7	145-188	B'h2	0.10	0.09	0.05	0.00	0.24	9.30	9.54	3	0.74	0.00	6.0	4.8	4.5	0.73	0.02	0.37	0.07	0.21
-8	188-203	B'h3	0.11	0.10	0.05	0.00	0.26	8.13	8.39	3	0.79	0.10	5.7	4.7	4.5	0.59	0.01	0.43	0.06	0.34
Tavares fine sand:																				
S82FL-027-03-1	0-15	Ap	2.15	0.41	0.01	0.06	2.63	1.39	4.02	65	0.62	0.06	6.3	5.9	5.9	---	---	---	---	---
-2	15-28	C1	1.07	0.19	0.01	0.02	1.29	1.76	3.05	42	0.28	0.03	6.6	5.9	6.0	---	---	---	---	---
-3	28-58	C2	0.39	0.10	0.01	0.02	0.52	1.69	2.21	24	0.20	0.02	5.9	5.4	4.9	---	---	---	---	---
-4	58-91	C2	0.09	0.05	0.01	0.01	0.16	1.17	1.33	12	0.13	0.01	5.8	5.2	4.6	---	---	---	---	---
-5	91-137	C3	0.08	0.05	0.01	0.01	0.15	0.34	0.49	31	0.05	0.01	5.8	5.3	4.9	---	---	---	---	---
-6	137-170	C4	0.06	0.02	0.02	0.01	0.11	0.42	0.53	21	0.02	0.01	5.9	5.4	5.0	---	---	---	---	---
-7	170-203	C4	0.06	0.02	0.02	0.01	0.11	0.42	0.53	21	0.01	0.01	5.9	5.6	5.2	---	---	---	---	---

See footnote at end of table.

TABLE 20.--CHEMICAL ANALYSES 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
Valkaria fine sand:																				
S84FL-027-08-1	0-15	Ap	2.55	0.78	0.09	0.04	3.46	4.15	7.61	45	1.79	0.21	5.0	4.9	5.1	---	---	---	---	---
-2	15-51	E1	0.33	0.11	0.03	0.00	0.47	0.89	1.36	35	0.22	0.06	5.5	5.2	5.3	---	---	---	---	---
-3	51-63	E2	0.05	0.03	0.01	0.00	0.09	0.07	0.16	56	0.01	0.02	5.6	5.2	5.2	---	---	---	---	---
-4	63-79	Bw	0.07	0.05	0.03	0.00	0.15	0.29	0.44	34	0.02	0.03	4.9	5.0	4.9	---	---	---	---	---
-5	79-173	C1	0.08	0.05	0.03	0.00	0.16	0.02	0.18	89	0.02	0.11	5.1	5.1	5.3	---	---	---	---	---
-6	173-203	C2	0.64	0.22	0.06	0.01	0.93	1.35	2.28	41	0.05	0.10	4.8	4.5	4.5	---	---	---	---	---
Wabasso sand:																				
S85FL-027-17-1	0-18	A	1.15	0.70	0.14	0.03	2.02	9.44	11.46	18	2.53	0.05	4.3	3.4	3.1	---	---	---	---	---
-2	18-36	E1	0.54	0.16	0.04	0.01	0.75	2.70	3.45	22	0.53	0.00	4.7	3.5	3.4	---	---	---	---	---
-3	36-53	E2	0.19	0.05	0.02	0.00	0.26	1.02	1.28	20	0.19	0.02	4.9	3.7	3.6	---	---	---	---	---
-4	53-66	E3	0.08	0.04	0.01	0.00	0.13	0.77	0.90	14	0.15	0.00	5.1	3.9	3.7	---	---	---	---	---
-5	66-79	Bh	0.32	0.21	0.04	0.00	0.57	8.64	9.21	6	1.03	0.00	4.7	3.9	3.7	0.51	0.01	0.12	0.05	0.09
-6	79-94	Bt	3.32	1.60	0.10	0.04	5.06	17.17	22.23	23	0.59	0.00	5.0*	4.1	3.7	---	---	---	0.55	0.24
-7	94-140	Btg1	6.42	1.73	0.14	0.05	8.34	10.75	19.09	44	0.23	0.00	5.2	4.2	3.8	---	---	---	0.71	0.16
-8	140-203	Btg2	17.50	2.06	0.10	0.08	19.74	10.79	30.53	65	0.12	0.00	5.6	4.8	4.4	---	---	---	1.40	0.16
Zolfo fine sand:																				
S85FL-027-17-1	0-13	A	0.17	0.07	0.03	0.02	0.29	3.44	3.73	8	0.81	0.04	5.1	4.2	3.9	---	---	---	---	---
-2	13-36	E1	0.07	0.03	0.04	0.01	0.15	2.62	2.77	5	0.51	0.03	5.2	4.6	4.2	---	---	---	---	---
-3	36-114	E2	0.02	0.02	0.01	0.00	0.05	1.44	1.49	3	0.20	0.01	5.2	4.9	4.6	---	---	---	---	---
-4	114-150	E3	0.02	0.01	0.01	0.00	0.04	1.28	1.32	3	0.10	0.01	5.1	4.9	4.7	---	---	---	---	---
-5	150-170	Bh1	0.03	0.02	0.01	0.00	0.06	2.42	2.48	2	0.24	0.01	5.0	4.8	4.5	0.21	0.03	0.12	0.12	0.08
-6	170-203	Bh2	0.02	0.01	0.01	0.00	0.04	2.98	3.02	1	1.30	0.00	5.1	4.7	4.4	0.28	0.02	0.12	0.09	0.06

* Field pH was used in soil description. Laboratory pH is slightly outside the present range in characteristics for the series and is suspect.

TABLE 21.--CLAY MINERALOGY OF SELECTED SOILS

Soil name and sample number	Depth	Horizon	Percentage of clay minerals: Montmorillonite	14 Angstrom intergrade	Kaolinite	Quartz
	Cm					
Basinger fine sand:						
S84FL-027-06-1	0-13	Ap	33	24	12	31
-4	76-137	Bh	40	9	22	29
-5	137-203	C	23	19	26	32
Bradenton fine sand:						
S85FL-027-13-1	0-10	Ap	96	0	2	2
-4	38-66	Btg	97	0	1	2
-7	147-203	Cg3	97	0	1	2
Chobee muck:						
S85FL-027-16-2	5-18	A	96	0	2	2
-4	68-119	Bt	97	0	1	2
-6	165-203	Cg	99	0	0	1
EauGallie fine sand:						
S84FL-027-11-1	0-18	Ap	0	0	0	100
-4	74-81	Bh1	10	16	10	64
-8	190-203	Btg2	14	9	66	11
Farmton fine sand:						
S82FL-027-01-1	0-10	A	0	0	16	84
-5	91-102	Bh2	0	26	20	54
-8	157-168	Btg2	0	13	81	6
Immokalee fine sand:						
S82FL-027-05-1	0-13	A	0	0	29	71
-3	109-119	Bh1	36	7	11	46
-5	140-165	C	32	17	36	15
Malabar fine sand:						
S84FL-027-10-1	0-15	A	41	22	16	21
-3	30-58	Bw1	26	16	20	38
-5	76-127	Bw3	0	0	57	43
-6	127-203	Btg	22	7	62	9
Ona fine sand:						
S85FL-027-18-1	0-13	Ap	0	35	15	50
-2	13-51	Bh	0	41	10	49
-5	117-203	B'h	0	21	7	72
Pomello fine sand:						
S82FL-027-04-1	0-15	Ap	0	25	18	57
-5	122-132	Bh2	27	15	12	46
-8	168-203	C	8	21	19	52
Pompano fine sand:						
S84FL-027-09-1	0-13	A	0	0	0	100
-3	30-74	Cg2	18	24	15	43
-5	155-203	Cg4	34	14	40	12
Samsula muck:						
S84FL-027-07-4	58-203	Cg	75	0	17	8
Satellite fine sand:						
S85FL-027-15-1	0-10	A	41	12	12	35
-3	102-203	C	27	0	5	68

TABLE 21.--CLAY MINERALOGY OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Percentage of clay minerals			
			Montmorillonite	14 Angstrom intergrade	Kaolinite	Quartz
	Cm					
Smyrna fine sand:						
S85FL-027-12-1	0-15	Ap	26	9	8	57
-3	30-38	Bh	0	0	0	100
-7	145-188	B'h2	24	19	10	47
Tavares fine sand:						
S82FL-027-03-1	0-15	Ap	0	35	24	41
-4	58-91	C2	0	37	14	49
-7	170-203	C4	13	13	13	61
Valkaria fine sand:						
S84FL-027-08-1	0-15	Ap	0	34	23	43
-4	63-79	Bw	0	0	48	52
-6	173-203	C2	0	34	40	26
Wabasso sand:						
S85FL-027-17-1	0-18	A	57	0	8	35
-5	66-79	Bh	33	18	7	42
-7	94-140	Btg1	89	0	6	5
-8	140-203	Btg2	92	0	5	3
Zolfo fine sand:						
S85FL-027-14-1	0-13	A	0	34	14	52
-5	150-170	Bh1	13	15	10	62

TABLE 22.--ENGINEERING INDEX TEST DATA

[Tests performed by the Florida Department of Transportation in cooperation with the U.S. Bureau of Public Roads, in accordance with standard procedures of the American Association of State Highway and Transportation Officials (AASHTO). See the section "Soil Series and Their Morphology" for location of pedon sampled. NP means nonplastic]

Soil name, report number, horizon, and depth in inches	Classification		Mechanical analysis *								Liquid limit	Plas- ticity index	Moisture density **	
			Percentage smaller than--				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
Basinger fine sand:														
(S84FL-027-06)														
E - - - - - 5-22	A-3(0)	SP	100	100	97	4	3	1	0	0	---	NP	101.6	15.5
Bh - - - - - 30-54	A-3(0)	SP-SM	100	100	97	6	5	4	3	2	---	NP	103.7	13.7
Chobee muck:														
(S85FL-027-16)														
Bt - - - - - 7-47	A-2-6(1)	SC	100	100	84	34	32	29	24	23	26	14	103.0	16.2
EauGallie fine sand:														
(S84FL-027-11)														
Bh2 - - - - 32-47	A-2-4(0)	SP-SM	100	100	97	11	7	4	2	1	---	NP	107.2	13.1
Btgl - - - - 68-75	A-2-4(0)	SM-SC	100	100	98	25	24	23	22	22	25	6	114.6	13.5
Farmton fine sand:														
(S82FL-027-01)														
E2 - - - - - 14-34	A-3(0)	SP-SM	100	100	97	9	7	4	2	2	---	NP	106.5	11.1
Immokalee fine sand:														
(S82FL-027-05)														
E - - - - - 5-43	A-3(0)	SP	100	100	93	3	2	1	0	0	---	NP	100.5	15.5
Malabar fine sand:														
(S84FL-027-10)														
Bwl - - - - 12-23	A-3(0)	SP	100	100	95	4	3	3	2	2	---	NP	104.1	13.5
Btg - - - - 50-80	A-2-4(0)	SM-SC	100	100	96	21	20	19	18	18	24	7	115.5	12.9
Ona fine sand:														
(S85FL-027-18)														
B'h - - - - 46-80	A-3(0)	SP-SM	100	100	99	8	7	5	2	1	---	NP	106.5	13.5
Pomello fine sand:														
(S82FL-027-04)														
E - - - - - 6-46	A-3(0)	SP-SM	100	100	96	6	5	3	1	1	---	NP	104.2	10.6
Pompano fine sand:														
(S84FL-027-09)														
Cg2 - - - - 12-29	A-3(0)	SP	100	100	95	4	3	3	0	0	---	NP	104.7	14.2
Samsula muck:														
(S84FL-027-07)														
Cg - - - - - 23-80	A-3(0)	SP-SM	100	100	96	5	3	2	1	1	---	NP	117.3	15.2

TABLE 22.--ENGINEERING INDEX TEST DATA--Continued

Soil name, report number, horizon, and depth in inches	Classification		Mechanical analysis *								Liquid limit	Plas- ticity index	Moisture density **	
			Percentage smaller than--				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 fine sand: (S85FL-027-15)														
C ------ 4-80	A-3(0)	SP-SM	100	100	96	5	2	1	0	0	---	NP	100.8	15.4
Smyrna fine sand: (S85FL-027-12)														
E' ------ 19-37	A-3(0)	SP-SM	100	100	96	5	3	2	0	0	---	NP	106.5	14.8
Tavares fine sand: (S82FL-027-03)														
C2 ------ 11-36	A-3(0)	SP-SM	100	100	98	5	3	2	2	2	---	NP	101.7	15.0
Valkaria fine sand: (S84FL-027-08)														
E1 ------ 6-20	A-3(0)	SP-SM	100	100	98	5	3	2	0	0	---	NP	104.7	14.6
C1 ------ 31-68	A-3(0)	SP-SM	100	100	98	6	3	3	2	2	---	NP	102.7	15.4
Wabasso sand: (S85FL-027-17)														
Btg1 ---- 35-55	A-2-6(0)	SM	100	100	95	30	29	28	25	25	32	12	111.0	14.6
Zolfo fine sand: (S85FL-027-14)														
E2 ------ 14-45	A-3(0)	SP-SM	100	100	97	7	7	4	2	1	---	NP	105.1	13.9

* Mechanical analyses according to AASHTO designation T88-81. Results by this procedure differ somewhat from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHTO procedure, the fine material is analyzed by the hydrometer method and the various grain-sized fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method and the material coarser than 2 millimeters in diameter is excluded from the calculations of grain-sized fractions. The mechanical analyses used in this table are not suitable for use in naming textural classes for soil.

** Based on AASHTO Designation T99-81.

*** Based on AASHTO Designation M145-82.

TABLE 23.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Anclote	Sandy, siliceous, hyperthermic Typic Haplaquolls
Basinger	Siliceous, hyperthermic Spodic Psammaquents
Bradenton	Coarse-loamy, siliceous, hyperthermic Typic Ochraqualfs
Cassia	Sandy, siliceous, hyperthermic Typic Haplohumods
Chobee	Fine-loamy, siliceous, hyperthermic Typic Argiaquolls
Delray	Loamy, siliceous, hyperthermic Grossarenic Argiaquolls
Durbin	Euic, hyperthermic Typic Sulfihemists
EauGallie	Sandy, siliceous, hyperthermic Alfic Haplaquods
Farmton	Sandy, siliceous, hyperthermic Arenic Ultic Haplaquods
Felda	Loamy, siliceous, hyperthermic Arenic Ochraqualfs
Floridana	Loamy, siliceous, hyperthermic Arenic Argiaquolls
Gator	Loamy, siliceous, euic, hyperthermic Terric Medisaprists
Immokalee	Sandy, siliceous, hyperthermic Arenic Haplaquods
Malabar	Loamy, siliceous, hyperthermic Grossarenic Ochraqualfs
Myakka	Sandy, siliceous, hyperthermic Aeric Haplaquods
Ona	Sandy, siliceous, hyperthermic Typic Haplaquods
Pineda	Loamy, siliceous, hyperthermic Arenic Glossaqualfs
Pinellas	Loamy, siliceous, hyperthermic Arenic Ochraqualfs
Pomello	Sandy, siliceous, hyperthermic Arenic Haplohumods
Pompano	Siliceous, hyperthermic Typic Psammaquents
Punta	Sandy, siliceous, hyperthermic Grossarenic Haplaquods
Samsula	Sandy or sandy-skeletal, siliceous, dysic, hyperthermic Terric Medisaprists
Satellite	Hyperthermic, uncoated Aquic Quartzipsamments
Smyrna	Sandy, siliceous, hyperthermic Aeric Haplaquods
Tavares	Hyperthermic, uncoated Typic Quartzipsamments
Terra Ceia	Euic, hyperthermic Typic Medisaprists
Valkaria	Siliceous, hyperthermic Spodic Psammaquents
Wabasso	Sandy, siliceous, hyperthermic Alfic Haplaquods
Wulfert	Sandy or sandy-skeletal, siliceous, euic, hyperthermic Terric Sulfihemists
Zolfo	Sandy, siliceous, hyperthermic Grossarenic Entic Haplohumods

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