United States Department of Agriculture

Soil Conservation Service

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

Soil Survey of Citrus County, Florida

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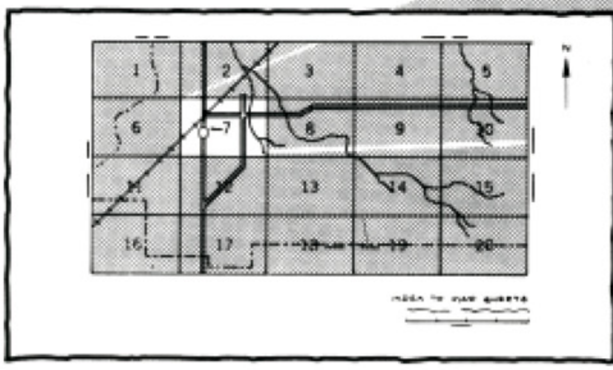

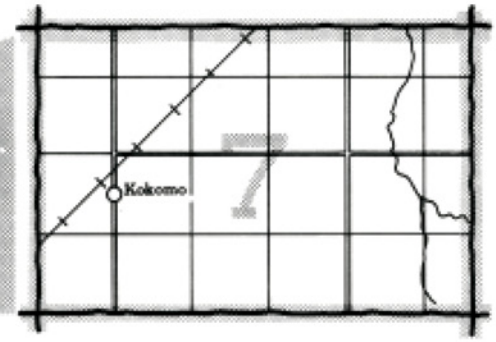

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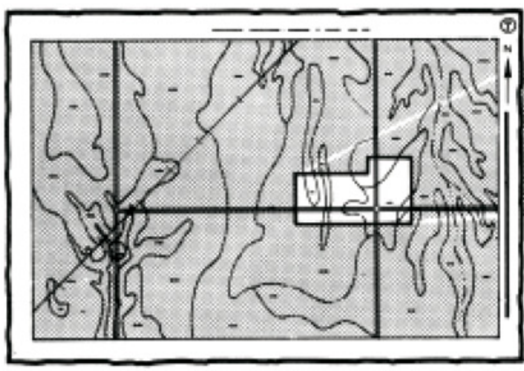

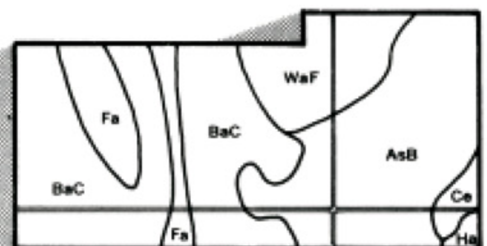

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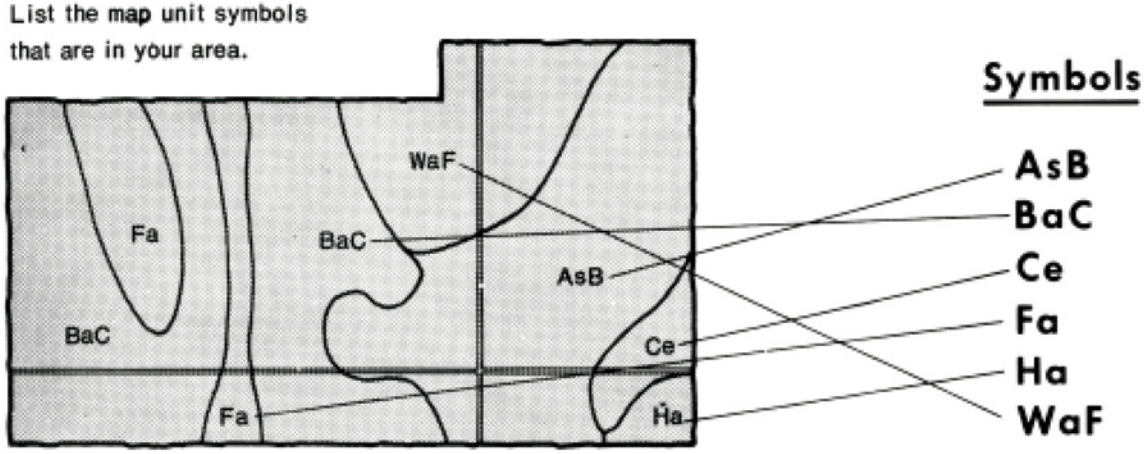
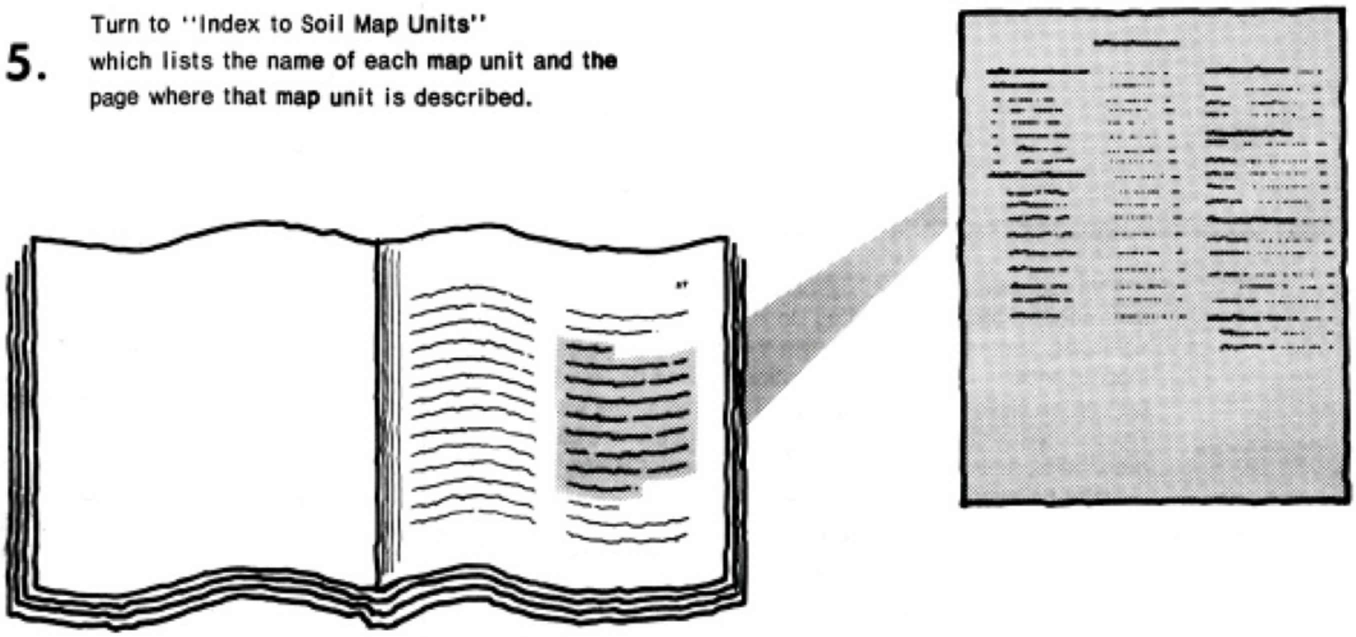
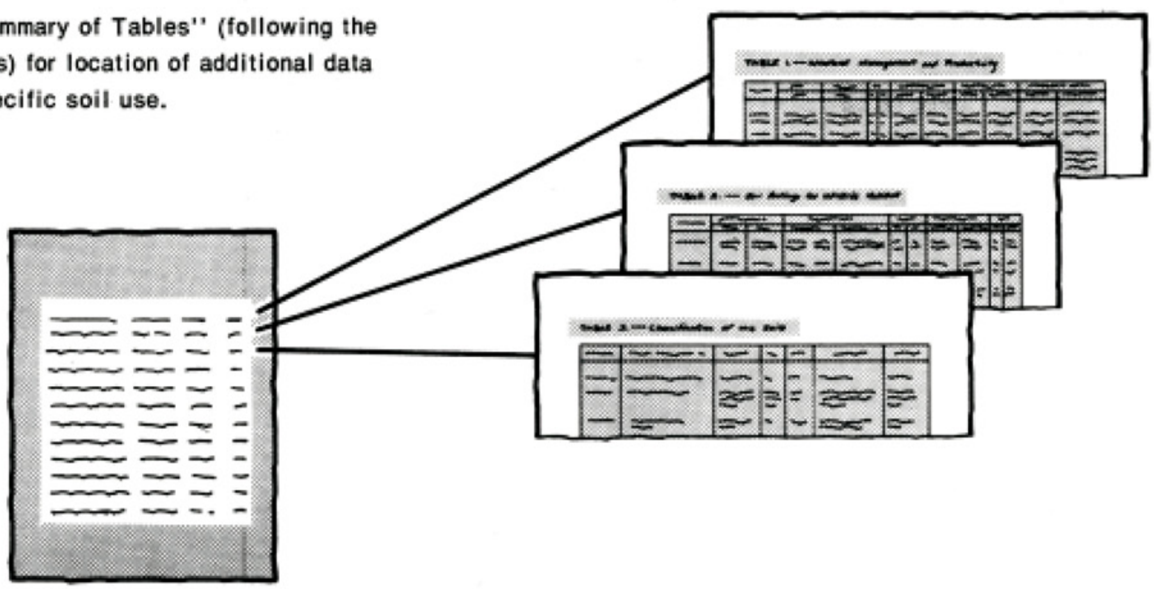


THIS SOIL SURVEY

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



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



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

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

Major fieldwork for this soil survey was completed in 1984. Soil names and descriptions were approved in 1985. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1985. This soil survey was made cooperatively by the Soil Conservation Service and the University of Florida, Institute of Food and Agricultural Sciences, Agricultural Experiment Stations and Soil Science Department, and Florida Department of Agriculture and Consumer Services. It is part of the technical assistance furnished to the Gulf Soil and Water Conservation District. The Citrus County Board of Commissioners contributed financially to the acceleration of the survey.

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

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

Cover: Aerial view of the Tsala Apopka Lake region. The soils adjacent to the lake are in the Tavares-Adamsville general soil map unit. (Photo courtesy of Seaburn and Robertson Inc., water resource consultants, Tampa, Florida.)

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Foreword

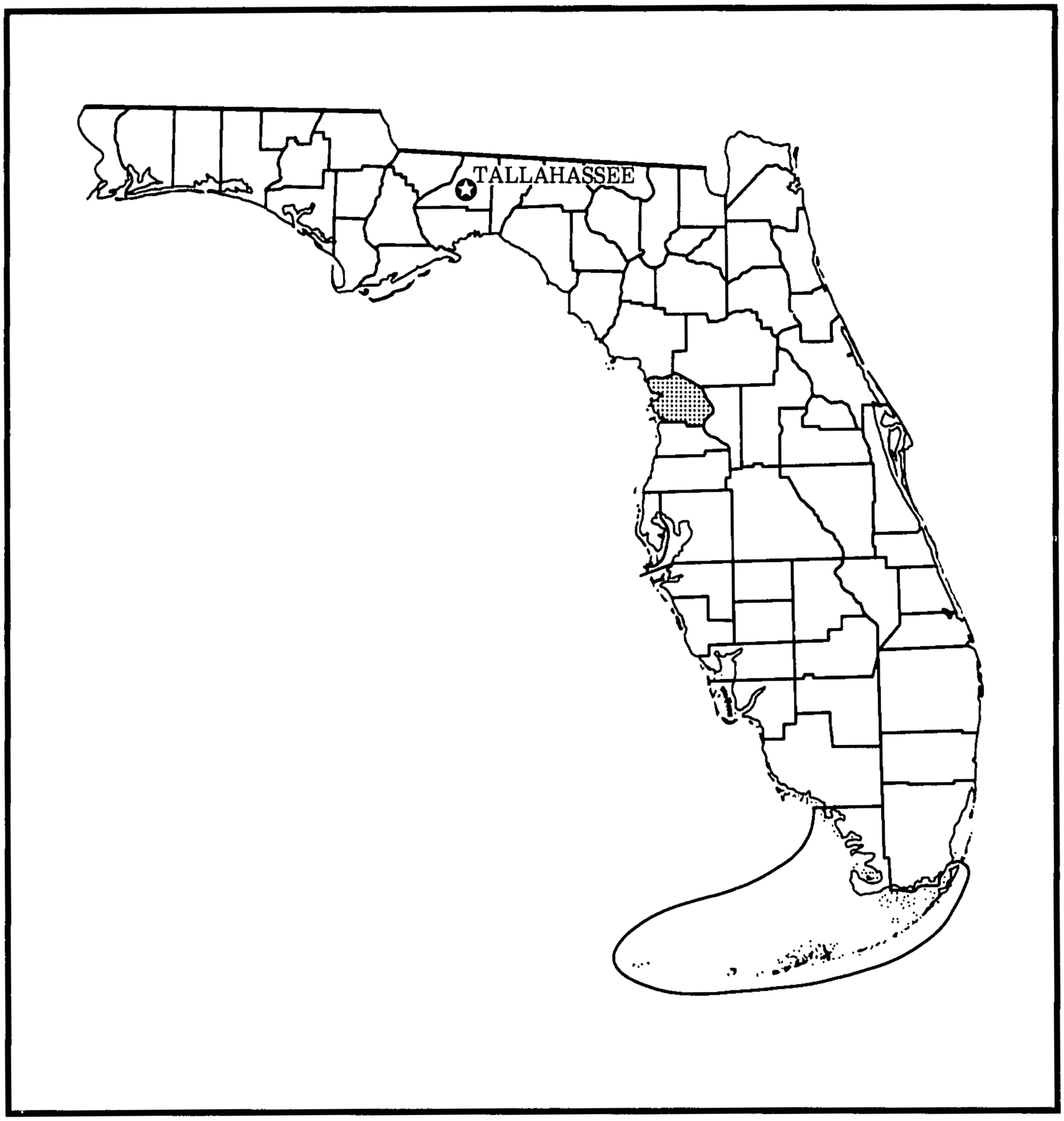
This soil survey contains information that can be used in land-planning programs in Citrus County, Florida. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the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

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

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

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

James W. Mitchell
State Conservationist
Soil Conservation Service



Location of Citrus County in Florida.

Soil Survey of
Citrus County, Florida

By Paul E. Pilny, Charles T. Grantham, Joseph N. Schuster,
and Daniel L. Stankey, Soil Conservation Service

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

CITRUS COUNTY is in the west-central part of Florida. It is bordered on the north by Levy and Marion Counties, on the east by Sumter County, on the south by Hernando County, and on the west by the Gulf of Mexico.

The county has a land area of 402,330 acres, or about 629 square miles. The city of Inverness is the county seat. In 1980, the population of the county was about 62,000 *(8)*. Inverness had a population of 5,700; Crystal River, the other incorporated municipality, had 3,400; and Beverly Hills, an unincorporated area, had a population of about 7,000. Other developments, such as Sugarmill Woods, Citrus Springs, Pine Ridge, and Citrus Hills, are planning for thousands of future residents.

The main industry of the area is the retirement industry because of the many pensioners who reside in the area and contribute steady income to the economy. Tourists, who visit the rivers of the Gulf Coast and the lakes and rivers of the east part of the county, often become residents.

Scattered throughout the county *(24)* were 19,029 acres of cropland and 28,841 acres of pastureland in 1982. Watermelons are one of the main cultivated crops. Other crops grown include soybeans, corn, and grasses. Citrus, mainly for a fresh fruit market, is grown in a few areas in the eastern part of the county. Several large cattle operations that utilize native and improved pasture are in the northwestern, south-central, and eastern parts of the county (fig. 1).

The Withlacoochee State Forest and the Citrus Wildlife Management Area occupy about 41,000 acres in the south-central part of the county. The 23,000 acre Chassahowitzka National Wildlife Refuge is along the southern coast. These three areas offer a wide variety of recreational opportunities.

General Nature of the County

In this section, the environmental and cultural factors that affect the use and management of soils in Citrus County are described. These factors are climate, history and development, physiography, economic geology, water resources, farming, transportation, and recreation.

Climate

Long, relatively humid summers and mild, dry winters characterize the climate of Citrus County. The climate is controlled by factors such as latitude, proximity of the gulf, and numerous inland lakes. Weather conditions vary considerably from year to year, but the differences disappear when a comparison is made on the basis of long-period averages. Temperature and precipitation data collected in the period 1941 to 1970 at Inverness are summarized in table 1 *(22, 23)*.

The usual rainy season is from June through September when about 60 percent of the annual rainfall occurs. The driest period is November through February when about 10 percent of the annual rainfall is expected. During the period 1941 to 1970, the average rainfall was 56.29 inches per year. In that period, it ranged from a low of 36.50 inches in 1956 to a high of 87.27 inches in 1960. The greatest monthly precipitation of record at

Figure 1.—Aerial view of the eastern part of the county, which includes woodland, water areas, citrus groves, pasture, and cropland, on a typical landscape of the Basinger-Immokalee-EauGallie general soil map unit.

Inverness was 22.62 inches during July 1909. In July 1964, the Chassahowitzka Wildlife Refuge recorded 22.62 inches of rain. Records also indicate that the average annual rainfall at the refuge is about 1 inch less than at Inverness.

The records indicate that there were a few years in which no measurable precipitation was recorded for periods of 30 days or more. Such prolonged periods of deficient rainfall generally occur during the expected dry season but can occasionally occur even during the expected rainy season. Several such dry periods in the course of 1 year or 2 years can lead to significantly lowered water tables and lake levels. In some years, rainfall can be unusually concentrated, and one-third to one-half as much rain falls in a single month as during an entire average year. During these periods, water tables can be rapidly elevated to above normal, and ponding and localized flooding can occur in some areas that are poorly drained.

Most summer precipitation is from localized afternoon or early evening thundershowers. Thundershowers occur on about 100 days each year, and about one-half of these days are during the summer. These showers are generally heavy and last for only 1 hour or 2 hours. The more severe thundershowers can be attended by locally strong winds. Daylong summer rains are infrequent and are generally associated with a tropical storm. A 2-day rainfall total of 14.1 inches was recorded at Inverness on September 6 and 7, 1950, during a tropical storm. The most severe tropical disturbances are hurricanes. The chance of hurricane force winds hitting the area in any given year is about 1 in 20.

Summer temperatures are fairly uniform from year to year and show little variation. Afternoon temperatures frequently reach 90 degrees during June through September. Temperatures above 95 degrees seldom occur. Temperatures over 100 degrees have been recorded 13 times in Inverness since 1899. The highest recorded temperature, which occurred on September 7, 1955, is 105 degrees. Winter temperatures display considerable daily and yearly variation. Much of the variation comes from unpredictable, generalized invasions of cold air masses from the north. These invasions can occur any time between mid-November and mid-March and generally last for at least 3 days. When the cold air masses drop temperatures to 32 degrees or lower, they are called freezes. Some winters, occasionally several in succession, pass with few cold air invasions; other years may bring several severe freezes. A single freeze can cause crop damage, but the most severe damage occurs when multiple freezes are separated by brief periods of relative warmth. In the intervening warm periods, the freeze damaged plants can recover and produce tender new growth. Such rapidly growing plants are very susceptible to cold and freeze damage. This sequence occurred during the "big freeze" of 1894-95. Before this date, a rapid expansion of acreage was planted to citrus. A freeze occurred in December 1894. The citrus trees were damaged but rapidly put on new growth during the warm period that followed. A second freeze occurred in February 1895 and killed most of the tender, rapidly growing trees. The big freeze and the later freezes caused growers to restrict citrus plantings to areas offering some protection from freezes. One such area is around Floral City where the many lakes have a moderating influence on temperature. During a freeze on February 13, 1899, a temperature of 14 degrees was recorded in Inverness. The probabilities for freeze dates in the spring and the fall are summarized in table 2.

Frost is due to local low temperature occurrences rather than generalized freeze conditions. Local temperatures are influenced by a combination of variable factors, such as elevation, air channels, and bodies of water and vegetation, soil types, and cultivation practices. At least one frost can be expected every year in Citrus County. The probability that the first frost will occur over most of the county about December 10 and the last frost will occur about February 10 is about 50 percent; the probability that a frost will occur by January 5 is about 90 percent; and the probability that the temperature will be 20 degrees or lower sometime during the potential frost period is about 10 percent.

The average relative humidity at midafternoon is about 50 to 65 percent. Humidity averages about 85 to 90 percent at night. The sun shines more than 70 percent of the time possible in summer and more than 60 percent in winter. Heavy fogs are usually confined to the night and early morning hours late in fall, in winter, and early in the spring. These fogs generally dissipate soon after sunrise. Wind direction is influenced by convectional forces inland and the land- and sea-breeze effect near the coast. The prevailing wind directions are somewhat erratic. Winds are generally from the north in winter and from the south in summer. Windspeed during the day generally is between 8 and 15 miles per hour and drops below 8 miles per hour at night. High local winds of short duration occasionally occur in association with thunderstorms and with cold fronts moving across the county.

History and Development

Miriam Cohen, Citrus County Historical Society, prepared this section.

Fossils from a rhinoceros-like animal that 8 to 10 million years ago roamed the area of what is now Citrus County have been uncovered at the foundation site of the nuclear power plant near Crystal River. Artifacts of human habitation, which date back to about 12,000 years ago, can be seen in the Crystal River Archaeological Museum *(5)*.

Indian tribes prospered in the central Florida Gulf area from 200 B.C. to about A.D. 1400, at which time they gradually dispersed.

The Crystal River Archaeological Museum site was a ceremonial burial ground for some of the people from these early tribes.

The Spanish exploration of Florida in the early 1500's included the expeditions of Ponce de Leon, of Panfilo de Narvaez, and of Hernando de Soto *(4)* into what is now Citrus County. De Soto's expedition landed in Tampa Bay in May 1539. By July 1539, his party had worked its way north to the Withlacoochee River area by traveling through what they called "the Big Swamp"—the marshes and lakes of the Tsala Apopka chain just east of the river. Passing through the Floral City area, de Soto traveled north along the banks of the lake and arrived in the Inverness area on July 23. Along the way, they were attacked by the Timucuan Indians. In honor of de Soto, a community in the area was named Hernando.

After the extinction of the Timucuan Indians, probably from exposure to the white men's diseases to which they had no immunity, Creek and Hitchiti Indians from Georgia and Alabama came to Florida to hunt and fish the many rivers, lakes, and forests. They became known as the Seminoles. In the 1800's, the Seminoles fought three wars against the United States because the United States Government pursued a policy of removing them to Arkansas and other midwestern territories.

During the second of the Seminole wars, from 1835 to 1842, skirmishes took place in Citrus County *(10)*. The movements of the United States Army troops through the Citrus County area were documented in the diary of a young lieutenant, Henry Prince, who was on his first assignment with the Army after his graduation from West

Point. The camp of the Indian chief, Osceola, the most famous and tragic figure of the Seminole warriors, is believed to have been just east of the Withlacoochee River, west of Fort Cooper. From this camp, Osceola led many of the attacks against Fort Cooper. Fort Cooper, the site of a hastily-constructed stockade that withstood Indian attack for 16 days, is now a State park. Every April, the park rangers present a living history of the encampment.

Many Citrus County landmarks bear such Indian names as Tsala Apopka, Chassahowitzka, Homosassa, Istachatta, and Withlacoochee.

The first white settlers came into the area just prior to the second Seminole War. David Levee Yulee, one of Florida's most colorful political figures and its first United States senator, started a large plantation near the Homosassa River. He raised sugarcane and developed a large mill which was burned by Union troops during the Civil War. Its remains, considered to be the oldest structure in the county, are now protected in a small State park where many visitors come to rest and picnic.

The Armed Occupation Act of 1842, which gave 160 acres of land to homesteaders, brought settlers to Red Level, Cedar Grove, Homosassa, and Crystal River. By the 1880's, small settlements were established around the county, and the discovery of phosphate brought rapid development to the Hernando and Floral City areas. The construction of the railroad hastened this development, and the southernmost point of the new railroad on the Gulf side of Florida was Homosassa. Floral City, according to the 1885 census, had a population of 300, twice as many as Miami with 150. In 1887, an act of the Florida Legislature divided Hernando County, and Citrus and Pasco Counties were created.

The working of the phosphate mines was by hand labor. Some of the families of the workers are among the earliest pioneers, and some of their descendants are still living in the county. With the advent of World War I, the United States lost its best customer for phosphate—Germany—and the industry declined.

Development of Citrus County ground to a standstill during the depression years that followed, even though a few hardy settlers and some farseeing entrepreneures bought land in the county. After World War II, inhabitants of the larger cities to the south, notably Tampa and St. Petersburg, considered Citrus County a perfect weekend retreat where they could enjoy superb fishing and hunting throughout the year. It wasn't long before weekend cabins were being remodeled into year-round homes, and new construction began for northerners looking for a balmy climate and peaceful surroundings for their retirement years.

Citrus County's growth in the 1970's was the most rapid in the state—a huge increase of 185 percent— and despite the recession of the early 1980's, the county's growth has continued at a steady pace *(8)*. Agriculture and tourism contribute to the economy of the county. Citrus groves have been active for as long as 100 years. Before the railroad was constructed, fruit was shipped from the county through the Orange State Canal. Cattle, poultry, watermelons, and seafood are also exported from the county. The preservation of an endangered species, the West Indian manatee, which is maintaining a stable population in its protected Crystal River sanctuary, is a major tourist attraction in Citrus County.

Physiography

Steven M. Spencer, geologist, Florida Geological Survey, Tallahassee, Florida, prepared this section.

This discussion of the physiography of Citrus County is based on William A. White's classification *(26)*. The major physiographic features of Citrus County include the Gulf Coastal Lowlands, the Brooksville Ridge, and the Tsala Apopka Plain.

The western part of Citrus County is a poorly drained, low relief region. Notable features include extensive swamps, marshes, and terraces that formed by ancient sea-level stands. The central part of the county is characterized by the Brooksville Ridge. The southern extent of this ridge is higher and areally larger than that in the north. The eastern part of Citrus County is lower and flatter and encompasses a substantial wetland area.

Gulf Coastal Lowlands

The Gulf Coastal Lowlands extend the entire length of Citrus County. The lowlands range in elevation from sea level to 100 feet above sea level. In the coastal lowlands are the coastal swamps and marine terraces of Pleistocene age (10,000 to 1.6 million years ago).

The westernmost region delineated on W.A. White's physiographic map is the Coastal Swamps *(26)*. W.S. Puri and R.O Vernon *(11, 25)* and W.A. White *(26)* defined this region as an area that included all continuous freshwater swamps and saltwater marshes adjacent to the Gulf of Mexico. The region is a low energy, saltwater or freshwater environment with insufficient sand to build beaches. Sediment, which accumulated on Eocene limestone, has in many places been conducive to the establishment of vegetation. Elevations in the swamp area are generally less than 10 feet above mean sea level.

The marine terraces are gently sloping features with seaward-facing escarpments. These features formed when sedimentary materials were alternately deposited, and they eroded as sea level rose and fell. R.O. Vernon distinguished the Pamlico Terrace at an elevation of about 25 feet and the Wicomico Terrace at an elevation of about 100 feet as the main terrace features in Citrus County *(25)*. Also associated with the coastal lowlands are ancient dune features. The lowlands are composed of sand and clayey sand of variable thickness underlain by Eocene and Oligocene limestone and dolomite.

Brooksville Ridge

The Brooksville Ridge trends north to south and occupies the central part of Citrus County. Elevations along the ridge range from about 70 to 200 feet. The southern part of the ridge is wider and has higher elevations than the northern part. The ridge has an irregular surface that resulted from karst activity. Elevations can vary over 100 feet in short distances.

The ridge is composed of a core of limestone that is overlain by clayey sand, sandy clay, and clay, which in turn are overlain by Pleistocene sand. The clay and the clayey sediment have protected the underlying limestone from dissolution by limiting downward percolation of ground water in contrast to the Gulf Coastal Lowlands to the west and the Tsala Apopka Plain to the east. The Gulf Coastal Lowlands and the Tsala Apopka Plain have experienced substantial dissolution of limestone resulting in lower elevations.

Tsala Apopka Plain

The Tsala Apopka Plain, which is part of W.A. White's Western Valley, occupies the entire eastern part of Citrus County *(26)*. The Tsala Apopka Plain is bounded on the east by the Withlacoochee River and on the west by the Brooksville Ridge. This region has many interconnected lakes partly separated by peninsulas and islands. Alluvial deposits of variable thickness cover the limestone surface. Elevations of the land surface range from 60 to 80 feet above mean sea level, and elevations of the water surface vary from 35 to 45 feet.

Economic Geology

Stone

Limestone is mined predominantly in the northern part of Citrus County near Red Level and in the southeast part near Lecanto. Formational units from which mining is occurring are the late Middle Eocene age Avon Park Limestone, the late Eocene age Ocala Group, and the Oligocene age Suwannee Limestone *(12)*.

All limestone and dolomite is mined from open-pit quarries. Generally, overburden must be removed using bulldozers or draglines. If soft rock conditions are encountered after the overburden is removed, bulldozers equipped with a claw can rip the rock loose. Blasting is necessary to fracture harder rock. If pits are flooded, draglines are needed to mine the limestone. After mining, the rock is transported by truck to a processing plant to be crushed and stockpiled.

Size reduction and grinding are common processing procedures. These involve crushing and screening to produce material of a desired size. The procedures used to remove impurities and to add desirable materials are washing, screening, drying, and blending. After processing is completed, the material can be used as a base material for roads and streets, as fertilizer and soil conditioner, for riprap, and as a concrete and asphalt aggregate.

Sand

In Citrus County, the Brooksville Ridge contains sand deposits of primary importance. The sands of the ridge range in age from Miocene to Recent. These clastics are predominantly poorly sorted, fine to medium grain-size quartz sands. Except for surface sand, the sand can contain a clay matrix *(14)*.

Recent dune and alluvial sand deposits are in Citrus County but are of variable quality and volume. These deposits are economically valuable only on a local scale. Sand deposits of the Pleistocene terraces in the Gulf Coastal Lowlands are considered too fine grained for construction uses.

Once mined, sand can be graded by size, coarse to fine, by using a series of shaker screens. Sand is almost exclusively transported by truck. Construction sand and gravel are mainly used as a concrete aggregate, base material for roads and streets, construction fill material, and an asphalt aggregate.

Phosphate

Hardrock phosphate was mined in Citrus County for many years until about 1966 when it became economically unfeasible to continue operations *(7)*. The origin of the hardrock phosphate has been discussed for many years. Phosphoric acid in solution in water can, under favorable conditions, replace the carbonate of limestone thus forming calcium phosphate, or hardrock phosphate. E.H. Sellards states that the matrix material in the hardrock phosphate deposits is the residue of previously eroded limestone *(15)*.

During mining and beneficiation of the hardrock phosphate, the phosphatic clay was slurried and discarded as waste in previously mined-out pits or was simply allowed to flow on to the natural ground surface. The content of phosphate in this waste material is high. Several companies are processing the clay waste material of former hardrock operations mainly for use as an ingredient in animal feed and as a direct application fertilizer.

Clay

Clay of an unclassified nature is being mined east of the Lecanto area in Citrus County.

Ground Water

In Citrus County, the main source of water is the Floridan Aquifer. The aquifer is composed of the Eocene to Oligocene age limestone and dolomite of the Lake City Limestone, Avon Park Limestone, and Ocala Group, and also of the Suwannee Limestone if present. The base of the aquifer is approximately at the point where evaporites consistently fill limestone and dolomite pore spaces. Generally, these evaporite fillings are in the lower Lake City Limestone *(9)*. The top of the aquifer is at sea level or is submerged just along the coast line. Inland, the top of the aquifer is covered by a veneer of sand, clayey sand, or sandy clay. The Floridan Aquifer is described as unconfined for much of Citrus County because of the absence of well developed, slowly permeable or very slowly permeable sediment between the ground surface and the top of the aquifer. In some areas in the Brooksville Ridge, the aquifer is overlain by several feet of slowly permeable or very slowly permeable sand, clayey sand, and clay. The aquifer can be described as semiconfined. In these areas, the local ground water table can be developed in the surficial sand that is underlain by clayey sediment.

The Floridan Aquifer is recharged by precipitation and ground water flow. Direction of ground water flow is toward the Gulf of Mexico. Natural artesian discharge occurs in springs and marshes. On the basis of discharge, the Homosassa and Crystal River Springs have been labeled first-order magnitude springs, that is, they discharge water at a rate of more than 100 cubic feet per second.

In Citrus County, the Floridan Aquifer is considered to be a potable water source. The exception to this is in the coastal region where saltwater encroachment has occurred. As demand for water increases so will the problems associated with water quality. Citrus County has shown a population increase of 185 percent according to the census taken between 1970 and 1980 *(8)*. Presently, the major demand on the aquifer comes from the agricultural and industrial communities as well as from domestic and rural users.

Water Resources

Water is an important resource in Citrus County. The Withlacoochee River, the Tsala Apopka Lake on the east, and the Gulf of Mexico on the west provide superb fishing and water sports.

The major rivers in the county are the Homosassa, Halls, Chassahowitzka, Crystal, and Withlacoochee Rivers. The Withlacoochee River is one of the few rivers in the northern hemisphere that flows in a northerly direction. The Halls, Homosassa, Chassahowitzka, and Crystal Rivers originate from springs in Citrus County and are a major source of freshwater. Other sources of freshwater come from shallow ground water and deep aquifer wells. Most of the rainfall, which is about 56 inches in the county, infiltrates into the soil. Saltwater intrusion into the aquifer on the Gulf side of the county has been a problem during times of heavy water usage.

Farming

Farming has always been an important economic factor in Citrus County. One of the first areas to be farmed was around Homosassa where the soils were more fertile and large yields could be obtained without the use of manure. Among the crops grown were sugarcane, cotton, potatoes, pineapples, figs, and dates. Crops, such as hemp and agave, were planted in the upland areas. In the 1880's and 1890's, considerable acreage was planted to citrus during the "citrus boom." The climate, however, proved unfavorable because of periodic freezes. Much of the citrus was killed by the "big freeze" of 1894 and 1895. A more recent freeze, in 1985, produced additional damage and, as a result, citrus production in the area has been restricted to locations adjacent to water, which has a moderating effect on temperature extremes. Such locations include areas along county road 581 and around the Tsala Apopka Lake and the Withlacoochee River. The weather greatly affects yields even in these more favorable locations. Florida Citrus Mutual reports that a yield reduction of about 40 percent occurred between the 1979-80 harvest and the 1981-82 harvest. This was mainly because of the unfavorable years of low temperatures and low rainfall. Some of the less productive citrus plantings are undergoing conversion to residential development.

Cattle production is also an important economic factor in the area. Grasses on improved pasture and native vegetation on the rangeland are used for grazing. Bahiagrasses are the main plants on improved pasture. Some fields of Coastal bermudagrass are alternately used for hay production or for grazing. Where favorable, the planting of winter rye, ryegrass, alyce clover, and perennial peanuts will be increased in the future. These plants are grown to provide hay to be used for grazing and to be used as soil-improving crops.

Other crops grown are corn, sorghum, oats, wheat, soybeans, and watermelons (fig. 2). Yields are erratic because of fluctuating weather conditions. To maintain or increase crop yields during dry periods, an irrigation system should be installed.

Additional agricultural industries in Citrus County include those in the production of poultry products and nursery and greenhouse plants.

Transportation

In Citrus County good transportation facilities are available, including many county, State, and Federal highways. Several interstate trucking firms serve the county.

Rail and bus services are available throughout the area. Scheduled airlines serve the county at the Tampa International Airport. Small public airports are near Inverness and Crystal River. Several private airstrips have been established in the county.

Figure 2.—These watermelons are being harvested on Lake fine sand, 0 to 5 percent slopes. (Photo courtesy of Citrus County Chronicle, Tim Hess, photographer).

Recreation

A variety of recreational facilities are available in Citrus County. The rivers and lakes and the Gulf provide for excellent fishing, boating, sailing, water skiing, and scuba diving. The waters are plentiful with black bass, speckled perch, bluegill, shellcracker, grouper, spotted sea trout, catfish, and many other species. Tarpon are caught from April to October. Many kinds of wildlife can be seen in the Chassahowitzka National Wildlife Refuge and in the Citrus Wildlife Management Area in the Withlacoochee State Forest. Recreational activity is available at several parks, such as Whispering Pines Park in Inverness and Fort Cooper State Park south of Inverness. Also, in the Withlacoochee State Forest are riding paths and camping and recreational areas. In the Citrus County area are various private and municipal golf courses and several historical sites, such as the Yulee Sugar Mill in Homosassa and the Crystal River State Archaeological Site north of Crystal River.

How This Survey Was Made

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

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

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

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

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

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

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

Map Unit Composition

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

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

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

General Soil Map Units

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

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

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

Mineral Soils of the Upland Ridge

The three map units in this group are in the central part of Citrus County. They are in the Brooksville Ridge physiographic region.

1. Candler-Lake-Astatula

Nearly level to moderately sloping, excessively drained soils that are sandy throughout

The soils in this map unit are on upland ridges in the central part of the county. The landscape consists of broad rolling ridges, knolls, and hillsides. The slopes are smooth and dissected by very few drainageways. The ridges are in a north-south orientation. The slopes range from 0 to 12 percent.

This map unit makes up about 46 percent of Citrus County. It is about 42 percent Candler soils, 18 percent Lake soils, 18 percent Astatula soils, and 22 percent soils of minor extent.

Candler soils are on upland ridges. They are in intermediate positions on the landscape. These soils have a surface layer of dark grayish brown fine sand. The subsurface layer is fine sand in shades of brown. The next layer is a mixture of very pale brown fine sand subsurface and subsoil material. Yellowish brown loamy fine sand lamellae are in the lower part of this mixed layer.

Lake soils are on upland ridges. They are in slightly lower positions on the landscape than Candler soils. Lake soils have a surface layer of dark brown fine sand. The underlying material is fine sand in shades of yellow and brown.

Astatula soils are on upland ridges. They are in slightly higher positions on the landscape than Candler soils. Astatula soils have a surface layer of light brownish gray fine sand. The underlying material is fine sand in shades of yellow.

The soils of minor extent in this map unit are Adamsville, Apopka, Arredondo, Basinger, Fort Meade, Kendrick, and Tavares soils. Adamsville and Tavares soils are in low positions on the landscape on the upland ridges. Adamsville soils are somewhat poorly drained, and Tavares soils are well drained. Apopka, Arredondo, Fort Meade, and Kendrick soils are on nearly level to moderately sloping ridges. These soils are well drained. Basinger soils are in low positions on the landscape in sloughs. These soils are poorly drained. In addition, areas of Udorthents and Quartzipsamments soils are throughout this map unit.

In most areas, the soils in this map unit are in native vegetation of turkey oak, sand pine, live oak, and longleaf pine trees. Large acreages are used as sites for residential development. In some areas, the soils are used as improved pasture; and in other areas, they are used for watermelons and citrus crops.

The soils in this map unit are well suited to urban use and are moderately well suited to recreational uses. They are fairly well suited to use as improved pasture and are poorly suited to commercial woodland. Droughtiness is the main limitation.

2. Arredondo-Kendrick-Sparr

Nearly level to moderately sloping, well drained and somewhat poorly drained soils that are underlain by loamy material; some are sandy to a depth of 20 to 40 inches, and some are sandy to a depth of more than 40 inches

The soils in this map unit are on upland ridges in the vicinity of Lecanto. The landscape consists of rolling hillsides and narrow ridges. Sinkholes are common and provide most drainage outlets for the soils in this map unit. The slopes range from 0 to 12 percent.

This map unit makes up about 5 percent of Citrus County. It is about 57 percent Arredondo soils, 24 percent Kendrick soils, 8 percent Sparr soils, and 11 percent soils of minor extent.

Arredondo soils are on the higher hillsides and ridges. They are well drained. These soils have a surface layer of grayish brown fine sand. The subsurface layer is yellowish brown fine sand. The subsoil is strong brown loamy fine sand and sandy clay loam.

Kendrick soils are in similar positions on the landscape as Arredondo soils. They are well drained. These soils have a surface layer of grayish brown fine sand. The subsurface layer is fine sand in shades of brown and yellow. The subsoil is sandy clay loam and sandy clay in shades of brown.

Sparr soils are on hillsides. These soils are in lower positions on the landscape than Arredondo and Kendrick soils. They are somewhat poorly drained. Sparr soils have a surface layer of grayish brown fine sand. The subsurface layer is fine sand in shades of brown. The subsoil is fine sandy loam and sandy clay loam in shades of brown and gray.

The soils of minor extent in this map unit are Lake, Candler, Kanapaha, and Micanopy soils. Lake, Candler, and Kanapaha soils are in similar or higher positions on the landscape than Arredondo, Kendrick, and Sparr soils. Lake and Candler soils are excessively drained, and Kanapaha soils are well drained. Micanopy soils are on low, gently sloping ridges. These soils are somewhat poorly drained.

In most areas, the soils in this map unit are used as improved pasture. In most other areas, they are in native vegetation of longleaf pine, slash pine, live oak, water oak, hickory, dogwood, and magnolia trees.

The soils in this map unit are well suited to urban and recreational uses. They are moderately well suited to use as improved pasture and as commercial woodland. Droughtiness is the main limitation.

3. Tavares-Adamsville

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

The soils in this map unit are on upland ridges adjacent to the flatwoods in the western part of the county and to the river valley lowlands in the eastern part. The slopes range from 0 to 8 percent.

This map unit makes up about 14 percent of Citrus County. It is about 50 percent Tavares soils, 21 percent Adamsville soils, and 29 percent soils of minor extent.

Tavares soils are nearly level to gently sloping and are moderately well drained. These soils are in higher positions on the landscape than Adamsville soils. Tavares soils have a surface layer of dark grayish brown fine sand. The underlying material is brown and white fine sand.

Adamsville soils are nearly level and are somewhat poorly drained. These soils are in lower positions on the landscape than Tavares soils. Adamsville soils have a surface layer of dark grayish brown fine sand. The underlying material is brown fine sand.

The soils of minor extent in this map unit are Astatula, Apopka, Sparr, Lochloosa, EauGallie, Immokalee, and Pompano soils. Astatula and Apopka soils are in higher positions on the landscape than Tavares and Adamsville soils. Astatula soils are excessively drained, and Apopka soils are well drained. Sparr and Lochloosa soils are in similar positions as Adamsville soils. These soils are somewhat poorly drained. EauGallie, Immokalee, and Pompano soils are on flats. These soils are poorly drained.

In most areas, the soils in this map unit are in native vegetation of turkey oak, live oak, water oak, longleaf pine, and slash pine trees that have an understory of grasses, forbs, and scattered saw palmetto. In some areas, these soils are used as improved pasture, and in some areas, they are used as sites for residential development.

The soils in this map unit are moderately well suited to urban and recreational uses and commercial woodland. They are fairly well suited to use as improved pasture. Wetness and droughtiness are the main limitations.

Mineral Soils of the Flatwoods

The two map units in this group are in the western part of Citrus County. They are in the Gulf Coastal Lowlands physiographic region.

4. Boca-Broward-Redlevel

Nearly level, poorly drained and somewhat poorly drained, sandy soils that are underlain by limestone bedrock; some are sandy, and some are sandy and loamy

The soils in this map unit are on the flatwoods in the northwestern part of the county. The landscape consists of broad flats that have depressions. A few sinkholes are common. During wet periods, the depressions are ponded. The slopes range from 0 to 2 percent.

This map unit makes up about 7 percent of Citrus County. It is about 47 percent Boca soils, 13 percent Broward soils, 10 percent Redlevel soils, and 30 percent soils of minor extent.

Boca soils are on flats and in depressions. They are poorly drained. These soils have a surface layer of dark grayish brown fine sand. The subsurface layer is gray and yellow fine sand. The subsoil is grayish brown sandy clay loam underlain by limestone bedrock.

Broward soils are in higher positions on the flats than Boca soils. Broward soils have a surface layer of very dark gray fine sand. The underlying material is gray and yellow fine sand underlain by limestone bedrock.

Redlevel soils are in similar positions on the landscape as Broward soils. They are somewhat poorly drained. These soils have a surface layer of dark brown and dark grayish brown fine sand. The subsoil is brown fine sand underlain by bedrock.

The soils of minor extent in this map unit are Adamsville, Basinger, Pineda, Hallandale, Myakka, Ona, and Anclote soils. Adamsville soils are in similar positions on the landscape as Broward and Redlevel soils. These soils are somewhat poorly drained. Basinger, Pineda, Hallandale, Myakka, and Ona soils are on the flatwoods. These soils are poorly drained. Anclote soils are in depressions. These soils are very poorly drained.

In most areas, the soils in this map unit are in native vegetation of cabbage palm and slash pine trees that have an understory of saw palmetto, grasses, and forbs. Cypress trees are dominant in the depressions. The soils in a few areas are used as improved pasture and as commercial woodland. In some areas, they are used as sites for residential development.

The soils in this map unit are poorly suited to urban and recreational uses. They are well suited to use as improved pasture and are moderately well suited to commercial woodland. Wetness and depth to bedrock are the main limitations.

5. Basinger-EauGallie-Myakka

Nearly level, poorly drained, sandy soils; some are sandy throughout, and some have a loamy subsoil at a depth of about 40 inches or more.

The soils in this map unit are on the flatwoods south of Crystal River and northwest of Red Level. The landscape consists of broad flats that have depressions and sloughs. During wet periods, the depressions are ponded, and the sloughs are covered with shallow, slow flowing water. The slopes range from 0 to 2 percent.

This map unit makes up about 5 percent of Citrus County. It is about 29 percent Basinger soils, 20 percent EauGallie soils, 14 percent Myakka soils, and 37 percent soils of minor extent.

Basinger soils are in the sloughs and depressions. These soils have a surface layer of black fine sand. The subsurface layer is light gray fine sand. The next layer is a mixture of gray fine sand subsurface material and brown fine sand subsoil material. The substratum is gray and white fine sand.

EauGallie soils are on the flats. These soils are in slightly higher positions on the landscape than Basinger soils. EauGallie soils have a surface layer of very dark gray and dark gray fine sand. The subsurface layer is gray fine sand. The upper part of the subsoil is brown fine sand, and the lower part is olive and gray fine sandy loam.

Myakka soils are in similar positions on the landscape as EauGallie soils. Myakka soils have a surface layer of black fine sand. The subsurface layer is gray fine sand. The subsoil is brown fine sand.

The soils of minor extent in this map unit are Immokalee, Malabar, Pompano, and Anclote soils. Immokalee, Malabar, and some Pompano soils are in similar positions on the landscape as EauGallie and Myakka soils. Anclote soils and some Pompano soils are in similar positions as Basinger soils. The soils of minor extent are poorly drained except Anclote soils, which are very poorly drained.

About 50 percent of the soils on the flatwoods in this map unit are in native vegetation of slash pine trees that have an understory of saw palmetto, grasses, and forbs. Cypress and hardwoods are in the depressions and sloughs. The remaining acreage is used as sites for residential development or as improved pasture.

The soils in this map unit are poorly suited to urban and recreational uses. They are moderately well suited to use as improved pasture and as commercial woodland. Wetness is the main limitation.

Mineral and Organic Soils of the Coastal Swamps, Tidal and Freshwater Marshes, and Coastal Islands

The three map units in this group are in the western part of Citrus County adjacent to the Gulf of Mexico. They are in the Gulf Coastal Lowlands physiographic region.

6. Homosassa-Weekiwachee-Durbin

Nearly level, very poorly drained, sandy and mucky soils; in tidal marshes

The soils in this map unit are in the tidal marshes adjacent to the Gulf of Mexico. The landscape consists of broad, tidal flats. These soils are flooded daily. The slopes are less than 1 percent.

This map unit makes up about 5 percent of Citrus County. It is about 46 percent Homosassa soils, 20 percent Weekiwachee soils, 18 percent Durbin soils, and 16 percent soils of minor extent.

Homosassa soils are inland from the tidal marshes. These soils have a surface layer of very dark gray mucky fine sandy loam and brown loamy fine sand. The underlying material is brown loamy fine sand underlain by limestone bedrock.

Weekiwachee soils are in broad, tidal marsh areas. These soils have a surface layer of black muck. The underlying material is dark gray fine sand underlain by limestone bedrock.

Durbin soils are in positions on the landscape that are exposed to open water. These soils have a surface layer of black muck more than 80 inches thick.

The soils of minor extent in this map unit are Lauderhill, Okeelanta, Terra Ceia, and Matlacha soils and rock outcrop. Lauderhill, Okeelanta, and Terra Ceia soils are more inland than the major soils of this map unit. These soils are very poorly drained. Matlacha soils are adjacent to dredged areas of this map unit. These soils are somewhat poorly drained. Areas of rock outcrop are throughout the map unit.

In most areas, the soils in this map unit are in native vegetation of needlegrass rush, seashore saltgrass, marshhay, cordgrass, and red mangrove. A few areas of these soils have been dredged and filled for use as sites for residential development.

The soils in this map unit are not suited to urban use or to use as improved pasture or commercial woodland. They are poorly suited to recreational uses. Wetness, depth to bedrock, and salinity are the major limitations. Flooding is a hazard.

7. Okeelanta-Lauderhill-Terra Ceia

Nearly level, very poorly drained, mucky soils; in coastal swamps

The soils in this map unit are in freshwater hardwood and cypress swamps. These swamps parallel the coast and are inland from the tidal marshes. The landscape consists of broad, freshwater flats. These soils are ponded for most of the year. The slopes are less than 1 percent.

This map unit makes up about 2 percent of the county. It is about 32 percent Okeelanta soils, 24 percent Lauderhill soils, 22 percent Terra Ceia soils, and 22 percent soils of minor extent.

Okeelanta soils have a surface layer of black and dark brown muck. The underlying material is light gray fine sand.

Lauderhill soils have a surface layer of black and dark brown muck underlain by limestone bedrock.

Terra Ceia soils are mainly adjacent to the uplands. These soils have a surface layer of black and very dark brown muck that extends to a depth of 80 inches or more.

The soils of minor extent in this map unit are Hallandale and Citronelle soils. These soils are in higher positions on the landscape than the major soils. In addition, areas of rock outcrop are throughout the map unit, and some areas of soils that are shallow and mucky are adjacent to tidal marshes.

In most areas, the soils in this map unit are in native vegetation of sweetgum, cypress, sweetbay, hickory, water oak, willow oak, laurel oak, and magnolia trees. In a few areas, they are used as improved pasture.

The soils in this map unit are poorly suited to urban and recreational uses and to use as commercial woodland. They are fairly well suited to use as improved pasture. Wetness and ponding are the main limitations.

8. Rock outcrop-Hallandale-Homosassa

Areas of exposed limestone bedrock; and nearly level, poorly drained and very poorly drained, sandy and loamy soils; in tidal and freshwater marshes and on coastal islands

The soils in this map unit are in tidal and freshwater marshes and on the coastal islands adjacent to the Gulf of Mexico. The landscape consists of broad, tidal flats, freshwater marshes, and coastal islands. The tidal flats are flooded daily by saltwater. The freshwater marshes are flooded daily by freshwater and brackish water. The coastal islands are rarely flooded except for flooding as a result of hurricanes.

This map unit makes up about 3 percent of Citrus County. It is 38 percent Rock outcrop, 30 percent Hallandale soils, 17 percent Homosassa soils, and 15 percent soils of minor extent.

The areas of Rock outcrop are on coastal islands and in marshes. They are exposed areas of limestone bedrock.

Hallandale soils are on coastal islands. They are poorly drained. These soils have a surface layer of black fine sand. The subsurface layer and subsoil are brown fine sand. The subsoil is underlain by limestone bedrock.

Homosassa soils are in the coastal marshes. They are very poorly drained. These soils have a surface layer of very dark gray mucky fine sandy loam and brown loamy fine sand. The underlying material is brown loamy fine sand underlain by limestone bedrock.

The soils of minor extent in this map unit are Lacoochee, Citronelle, Okeelanta, and Weekiwachee soils. Lacoochee soils are in coastal marshes. They are very poorly drained. Citronelle soils are on the coastal islands. They are in higher positions on the landscape than Hallandale and Homosassa soils. Citronelle soils are somewhat poorly drained. Okeelanta and Weekiwachee soils are in freshwater marshes. These soils are very poorly drained.

In most areas, the soils in this map unit are in native vegetation of seashore saltgrass, needlegrass rush, cordgrass, and sawgrass. Red cedar, pine, cabbage palm, live oak, water oak, and basswood trees are dominant on the coastal islands.

The soils in this map unit are not suited to urban use. They are poorly suited to recreational uses and to use as improved pasture and commercial woodland. Depth to bedrock, salinity, and wetness are the main limitations. Flooding is a hazard.

Mineral and Organic Soils of the River Valley Lowlands

The two map units in this group are in the eastern part of Citrus County between the Withlacoochee River and the upland ridges. They are in the Tsala Apopka Plain physiographic region.

9. Basinger-Immokalee-EauGallie

Nearly level, poorly drained, sandy soils; some are sandy throughout, and some have a loamy subsoil at a depth of about 40 inches or more

The soils in this map unit are on dissected uplands and lowlands adjacent to the Tsala Apopka chain of lakes. The landscape consists of hammocks, depressions, ridges, sloughs, and flatwoods. The slopes range from 0 to 2 percent.

This map unit makes up about 10 percent of Citrus County. It is about 24 percent Basinger soils, 19 percent

Immokalee soils, 11 percent EauGallie soils, and 46 percent soils of minor extent.

Basinger soils are in low-lying sloughs and depressions. These soils have a surface layer of black fine sand. The subsurface layer is light gray fine sand. The next layer is mixed gray fine sand of subsurface material and brown fine sand of subsoil material. The substratum is gray and white fine sand.

Immokalee soils are on flats. They are in slightly higher positions on the landscape than Basinger soils. Immokalee soils have a surface layer of black fine sand. The subsurface layer is fine sand in shades of gray. The subsoil is brown fine sand. The substratum is gray and white fine sand.

EauGallie soils are in similar positions on the landscape as Immokalee and Basinger soils. EauGallie soils have a surface layer of very dark gray and dark gray fine sand. The subsurface layer is gray fine sand. The upper part of the subsoil is brown fine sand, and the lower part is olive and gray fine sandy loam.

The soils of minor extent in this map unit are Pompano, Anclote, Malabar, Myakka, Paisley, Orsino, Pomello, Tavares, and Paola soils. Pompano and Anclote soils are in depressions. Pompano soils are poorly drained, and Anclote soils are very poorly drained. Malabar, Myakka, and Paisley soils are on flats. These soils are poorly drained. Orsino, Pomello, and Tavares soils are on hammocks and ridges. These soils are moderately well drained. Paola soils are on higher ridges than the major soils. These soils are excessively drained.

In most areas, the soils in this map unit are in native vegetation of longleaf and slash pines, live and water oaks, hickory, magnolia, and cabbage palm trees that have an understory of saw palmetto, waxmyrtle, inkberry, grasses, and forbs. Cypress and hardwood trees and maidencane are in the depressions. In some areas, these soils are used for citrus production. Some acreage has been used for residential development.

The soils in this map unit are poorly suited to urban and recreational uses. They are moderately well suited to use as commercial woodland and are well suited to use as improved pasture.

10. Terra Cela-Okeelanta

Nearly level, very poorly drained, mucky soils

The soils in this map unit are on the flood plains of the Withlacoochee River and the Tsala Apopka chain of lakes. The landscape consists of flats that have many small drainageways. Most areas of these soils are subject to frequent flooding.

This map unit makes up about 3 percent of Citrus County. It is about 53 percent Terra Ceia soils, 22 percent Okeelanta soils, and 25 percent soils of minor extent.

Terra Ceia soils are adjacent to open water. These soils have a surface layer of black and very dark brown muck that extends to a depth of 80 inches or more.

Okeelanta soils are between the Terra Ceia soils and the uplands. These soils have a surface layer of black and dark reddish brown muck. The underlying material is dark gray fine sand.

The soils of minor extent in this map unit are Basinger and Lauderhill soils. Basinger soils are adjacent to the uplands. These soils are poorly drained. Lauderhill soils are very poorly drained. Also throughout the map unit are areas of rock outcrop that are adjacent to water.

In most areas, the soils in this map unit are in native vegetation of water-tolerant hardwood and cypress trees.

The soils in this map unit are poorly suited to urban and recreational uses. They are also poorly suited to use as improved pasture and as commercial woodland. Wetness is the main limitation. Flooding is a hazard.

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 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, Arredondo fine sand, 5 to 8 percent slopes, is one of several phases in the Arredondo series.

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

A *soil complex* consists of two or more soils in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Williston-Pedro-Rock outrop complex, 2 to 5 percent slopes, is an example.

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

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

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

Table 3 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—Adamsville fine sand. This soil is nearly level and somewhat poorly drained. It is on low ridges in the coastal swamps and on the flatwoods and is at the base of the lower slopes on the uplands. This soil is in a transitional position in the drainage pattern. It gradually releases water to more poorly drained soil in natural drainageways, swamps, ponds, and marshes. The mapped areas are irregular in shape or somewhat circular and range from about 5 to 150 acres. The slopes are 2 percent or less.

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

Included with this soil in mapping are areas of Basinger, Myakka, Pompano, and Tavares soils. Also included are small areas of soils that are similar to Adamsville soil and have limestone boulders or bedrock in the profile. The included soils make up less than 20 percent of the map unit.

The water table is between depths of 20 and 40 inches for 2 to 6 months. It may rise to a depth of less than 20 inches for 2 weeks during very wet weather. During dry seasons, the water table generally recedes to a depth of more than 40 inches. Internal drainage is slow. Permeability is rapid. The available water capacity is very low. Reaction ranges from very strongly acid to mildly alkaline. Natural fertility is low. Plant response to fertilizer is good, but nutrients from fertilizer are rapidly leached.

Typically, this Adamsville soil is in the South Florida Flatwoods range site. This site can be identified by scattered pine trees that have an understory of saw palmetto and grasses. If grazing is controlled, this range site has the potential to produce significant amounts of creeping bluestem, lopsided indiangrass, chalky bluestem, and various panicum species. If the range deteriorates as a result of poor grazing management, saw palmetto and pineland threeawn (wiregrass) will dominate the site.

This soil is well suited to vegetable and other crops if a water control system, such as surface ditches and a subsurface drainage system, can be installed. Irrigation should also be considered because of the low available water capacity of the soil. A crop rotation system is needed that keeps the soil covered with soil-improving, close-growing cover crops at least two-thirds of the time. Soil-improving crops and crop residue left on the soil increase the content of organic matter in the soil. Fertilizer and lime should be applied according to the need of the crop.

This soil is moderately well suited to pasture. Pangolagrass and bahiagrass are well adapted to this soil. The more acid areas respond well to liming. Controlled grazing helps to maintain plant vigor for maximum yields. Controlled grazing is especially important if plants have been exposed to frost or drought.

This soil has a moderately high potential for the production of pine trees. Equipment use, seedling mortality, and undesirable plant competition are the main concerns in management. Slash pine is the most suitable tree to plant for commercial wood production.

This soil has severe limitations for many urban uses. The poor filtering capacity and seepage are limitations to use of this soil for sanitary facilities. If the soil is used for sewage lagoons and sanitary landfills, the facilities should be sealed to help prevent seepage. In addition, wetness is a severe limitation to use of this soil for most sanitary facilities and is a moderate limitation for most building site development. Proper management must be used to overcome the low natural fertility limitation and periodic droughtiness of this soil if it is used for landscaping and lawn development.

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

3—Candler fine sand, 0 to 5 percent slopes. This soil is nearly level to gently sloping and excessively drained. It is on uneven side slopes and convex ridgetops on the uplands. The mapped areas range from 4 to about 2,000 acres

Typically, the surface layer is dark grayish brown fine sand about 4 inches thick. The subsurface layer, to a depth of 72 inches, is very pale brown or light yellowish brown fine sand. The next layer to a depth of 80 inches or more is very pale brown fine sand that has yellowish brown loamy fine sand lamellae.

Included with this soil in mapping are areas of Adamsville, Apopka, Arredondo, Astatula, Lake, and Tavares soils. The included soils make up less than 20 percent of the map unit.

The water table is more than 80 inches below the surface throughout the year. Permeability is rapid. The available water capacity is very low or low. The soil is very droughty during periods of low rainfall. If the surface is protected by a vegetative cover, rain is rapidly absorbed and runoff is slow. If the vegetative cover is weakened or disturbed, wind and water erosion is a hazard on the more sloping areas. Natural fertility is low or very low. Plant response to fertilizer is low to moderate, but nutrients from fertilizer are rapidly leached. Reaction ranges from very strongly acid to medium acid except where lime has been applied.

Typically, this Candler soil is in the Longleaf Pine-Turkey Oak Hills range site. This site is on rolling land that is nearly level to strongly sloping. It is easily recognized by the landform and dominant vegetation of longleaf pine and turkey oak. The natural fertility of this site is very low as a result of the rapid movement of plant nutrients and water through the soil. The forage production and quality are poor, and cattle do not readily use this range site if other sites are available. Desirable forage on this site includes creeping bluestem, lopsided indiangrass, and low panicum.

This soil is very poorly suited to cultivated crops because of droughtiness and the rapid leaching of plant nutrients. As a result of these conditions, crop selection is restricted and the potential yield of selected crops is low. Intensive management practices are needed for cultivated crops. Row crops planted on the contour and in alternate strips with close-growing cover crops help control erosion in sloping areas. A crop rotation system is needed that keeps the soil covered with soil-improving, close-growing crops at least three-fourths of the time. Soil-improving crops and crop residue left on the soil help increase or maintain the content of organic matter in the soil. Irrigation is feasible if the value of the crop warrants. Fertilizer and lime should be applied according to the need of the crop.

This soil is moderately suited to pasture. Pangolagrass, bermudagrass, and bahiagrass are well adapted to this soil (fig. 3). Periodic droughts can reduce yields. Regular applications of fertilizer and lime are needed. Controlled grazing helps to maintain plant vigor, to obtain high yields, and to keep a good ground cover on the surface.

This soil has a moderate potential for production of pine trees. The limitations of the soil to use of equipment and seedling mortality are the main concerns in management. Sand and slash pines are the most suitable trees to plant for commercial wood production.

Poor filtering capacity and seepage are limitations to use of this soil for sanitary facilities. The limitations are slight for septic tank absorption fields; however, a high density of installations can contaminate the ground water. If the soil is used for sewage lagoons and sanitary landfills, the facilities should be sealed to help prevent seepage. The limitations for building site development are slight, but cutbanks may cave. This soil has severe limitations for landscaping. If used for landscaping, species adapted to droughty conditions should be planted or an irrigation system should be installed to supply water during dry periods. Fertilizer should be regularly applied.

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

4—Candler fine sand, 5 to 8 percent slopes. This soil is moderately sloping and excessively drained. It is on uneven side slopes on the upland ridges. The mapped areas are irregular in shape and range from about 3 to 75 acres.

Typically, the surface layer is very dark gray fine sand about 4 inches thick. The subsurface layer, to a depth of 60 inches, is brown, brownish yellow, and light yellowish brown fine sand. The next layer to a depth of 80 inches or more is very pale brown fine sand that has brown loamy fine sand lamellae.

Included with this soil in mapping are areas of Apopka, Arredondo, Astatula, Lake, and Tavares soils. Also included are small areas of Candler soils that have slopes of less than 5 percent and small areas of Candler

Figure 3.—This well managed field of pangolagrass is on Candler fine sand, 0 to 5 percent slopes.

soils that have slopes of up to 12 percent. The included soils are less than 20 percent of the map unit.

The water table is more than 80 inches below the surface throughout the year. Permeability is rapid. The available water capacity is low or very low. The soil is very droughty during periods of low rainfall. Runoff is slow in vegetated areas, and evaporation is minimal. Unprotected areas are subject to moderate wind and water erosion. Reaction ranges from very strongly acid to medium acid except where lime has been applied. Natural fertility is very low. Plant response to fertilizer is poor because nutrients are rapidly leached.

Typically, this Candler soil is in the Longleaf Pine-Turkey Oak Hills range site. This site is on rolling land that is nearly level to strongly sloping. It is easily recognized by the landform and dominant vegetation of longleaf pine and turkey oak. The natural fertility of this site is very low as a result of the rapid movement of plant nutrients and water through the soil. The forage production and quality are poor, and cattle do not readily use this range site if other sites are available. Desirable forage on this site includes creeping bluestem, lopsided indiangrass, and low panicum.

This soil is not suited to cultivated crops. The low or very low available water capacity, low natural fertility, and rapid leaching of plant nutrients are severe limitations. These limitations are difficult to overcome. Erosion is a severe hazard.

This soil is moderately suited to pasture when deep-rooted plants, such as Coastal bermudagrass and bahiagrasses, are grown. Periodic droughts can reduce yields. A well planned management program includes regular applications of fertilizer and lime and controlled grazing to help maintain plant vigor for maximum yields and to help keep a good ground cover on the surface.

This soil has a moderate potential for the production of pine trees. The major concern in management is equipment use, and seedling mortality is a moderate concern. Sand and slash pines are the most suitable trees to plant for commercial wood production.

Poor filtering capacity, seepage, and slope are limitations to use of this soil for sanitary facilities. The limitations are slight for septic tank absorption fields, but a high density of installations can contaminate the ground water. If the soil is used for sewage lagoons and sanitary landfills, the facilities must be properly constructed and sealed to help prevent seepage. Slope is a moderate limitation for most building site development. In addition, cutbanks may cave. Limitations for landscaping, lawns, and golf fairways are severe. Species adapted to droughty, very low fertility conditions should be planted or an irrigation system should be installed to supply water during dry periods. Fertilizer should be regularly applied.

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

5—Basinger fine sand. This soil is nearly level and poorly drained. It is in poorly defined drainageways and sloughs throughout the county. The mapped areas are irregular in shape, following the local drainage patterns. These areas range from 5 to about 100 acres. The slopes are less than 2 percent.

Typically, the surface layer is black fine sand 3 inches thick. The subsurface layer, to a depth of 8 inches, is light gray fine sand. The next layer, to a depth of 24 inches, is a mixture of light brownish gray subsurface material and dark reddish brown and dark brown subsoil material. The substratum to a depth of 80 inches or more is light gray and white fine sand.

Included with this soil in mapping are small areas of EauGallie, Immokalee, Myakka, and Pompano soils. Also included are small areas of soils that are similar to Basinger soil but have limestone bedrock at a depth of 65 inches or more. These similar soils mainly are in the coastal and extreme eastern parts of the county. The included soils make up about 25 percent of the map unit.

The water table is at a depth of less than 10 inches for 2 to 6 months. During dry seasons, it recedes to a depth of 30 inches or more. Internal drainage is slow. Permeability is rapid. The available water capacity is low. Reaction ranges from extremely acid to neutral. Natural fertility is low. Plant response to fertilizer is moderate.

Typically, this Basinger soil is in the Slough range site. This site can be identified by an open expanse of grasses, sedges, and rushes in an area that is saturated during the rainy season. If grazing is controlled, the potential of this site for forage production is almost as high as it is in the Freshwater Marshes and Ponds range site. Desirable forage plants on this site include blue maidencane, maidencane, chalky bluestem, toothachegrass, and South Florida bluestem. Carpetgrass, an introduced plant, tends to dominate the site if it is excessively grazed.

This soil is poorly suited to cultivated crops because of wetness, low natural fertility, and low available water capacity. Few crops are adapted to these conditions. With the installation of a water control system, such as surface ditches or a subsurface drainage system, and using well planned management practices for soil improvement, this soil can be used for many crops. Excess water must be rapidly removed during wet periods, and irrigation water should be available during dry periods. Row crops planted on the contour in alternate strips with close-growing cover crops help control erosion. A cropping system is needed that keeps the soil covered with close-growing, soil-improving crops three-fourths of the time. Bedding in rows during seedbed preparation helps to lower the depth of the water table. Fertilizer and lime should be applied according to the need of the crop.

This soil is well suited to improved pasture. Pangolagrass, improved bahiagrasses, and white clover grow well with proper management. Water control measures are needed to remove excess surface water after heavy rains. Regular applications of fertilizer and lime are needed. Controlled grazing prevents overgrazing and helps to maintain plant vigor for maximum yields.

With adequate drainage, this soil has a moderate potential for the production of pine trees. The main concerns in management are equipment use, seedling mortality, and undesirable plant competition. With adequate surface drainage, slash pine is the most suitable tree to plant for commercial wood production.

Wetness, poor filtering capacity, and seepage are severe limitations to use of this sandy soil for sanitary facilities. The installation of a water control system plus other construction measures may reduce these limitations to a more acceptable level. Wetness also is a severe limitation to use of the soil for most recreational uses, building site development, and landscaping and lawns. An adequate system of water control is needed to reduce this limitation. Cutbanks may cave.

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

6—Basinger fine sand, depressional. This soil is nearly level and poorly drained. It is in depressions and is adjacent to some bodies of water. The mapped areas are irregular in shape, long and narrow, or nearly circular and range from 3 to 50 acres. The slopes are less than 2 percent.

Typically, the surface layer is black fine sand 5 inches thick. The subsurface layer, to a depth of 24 inches, is light gray fine sand. The next layer, to a depth of 36 inches, is a mixture of gray subsurface material and dark brown and light brown subsoil material. The substratum to a depth of 80 inches is light gray sand.

Included with this soil in mapping are small areas of Adamsville, EauGallie, Immokalee, Myakka, and Tavares soils. Also included are a few small areas of soils that are similar to Basinger soil but have scattered limestone boulders at a depth of 60 inches or more and also a few depressional areas of soils on the upland ridges that are ponded about once in 6 years. The included soils make up less than 20 percent of the map unit.

This soil is ponded for periods of 3 to 9 months. In slightly elevated positions around the margins of the ponded areas, the water table is within 10 inches of the surface, and these areas are ponded in years of heavy rainfall. In dry periods, the water table recedes to a depth of 10 inches or more. Permeability is very rapid. The available water capacity is low. Reaction ranges from extremely acid to mildly alkaline. Natural fertility is low. Plant response to fertilizer is moderate.

Typically, this Basinger soil is in 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 that is generally saturated or covered by surface water during most of the growing season. Chalky bluestem and blue maidencane dominate the dry parts of the site, while maidencane is the dominant plant in the wet parts. Other desirable forage on this site includes cutgrass, bluejoint panicum, sloughgrass, and low panicums. Periodic high water levels provide natural deferment from cattle grazing if grazing is not properly controlled. Carpetgrass, an introduced plant, tends to dominate the dry parts of the site if it is excessively grazed.

This soil is not suited to cultivated crops or improved pasture. Although needed for crop production, water control systems are difficult to establish because suitable outlets are not available.

If water can be adequately controlled, this soil has a moderate potential for the production of pine trees. The main concerns in management are equipment use, seedling mortality, and undesirable plant competition.

Ponding severely limits the use of this soil for urban development.

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

7—Myakka fine sand. This soil is nearly level and poorly drained. It is in broad, flatwood areas and also occurs as a narrow band around some slightly depressional, poorly drained soils. The mapped areas are irregular in shape and range from 3 to about 100 acres. The slopes are smooth and less than 2 percent.

Typically, the surface layer is black fine sand 4 inches thick. The subsurface layer, to a depth of 27 inches, is dark gray and gray fine sand. The subsoil extends to a depth of 80 inches. It is black and dark reddish brown fine sand in the upper part and dark brown fine sand in the lower part.

Included with this soil in mapping are small areas of Basinger, EauGallie, and Pompano soils. Also included are a few areas of soils that are similar to Myakka soil in the western part of the county that have limestone bedrock within 60 inches of the surface. The included soils make up about 20 percent of the map unit.

The water table is at a depth of less than 10 inches for 1 month to 4 months. It gradually recedes to a depth of 40 inches or more. Internal drainage is slow. Permeability is moderate or moderately rapid in the subsoil and rapid in the other layers. The available water capacity is moderate in the subsoil and low or very low in the other layers. Reaction ranges from extremely acid to slightly acid. Natural fertility is low. Plant response to fertilizer is moderate.

Typically, this Myakka soil is in the South Florida Flatwoods range site. This site can be identified by scattered pine trees that have an understory of saw palmetto and grasses. If grazing is controlled, this range site has the potential to produce significant amounts of creeping bluestem, lopsided indiangrass, chalky bluestem, and various panicum species. If the range deteriorates as a result of poor grazing management, saw palmetto and pineland threeawn (wiregrass) will dominate the site.

This soil is moderately suited to cultivated crops if water control systems are properly installed and maintained. This generally involves the installation of ditches or a subsurface drainage system to remove excess surface water during wet periods and to provide water through irrigation during dry periods. A crop rotation system is needed that keeps the soil covered with close-growing, soil-improving crops three-fourths of the time. Crop residue left on the surface helps to maintain the organic matter in the soil. For some crops, bedding in rows is sometimes necessary to lower the depth of the water table. Fertilizer and lime should be applied according to the need of the crop.

This soil is well suited to improved pasture. Pangolagrass, improved bahiagrass, and white clover grow well when managed properly. Water control measures, such as the installation of surface or subsurface drains, are needed to remove excess surface water. Regular applications of fertilizer and lime are needed. Controlled grazing prevents overgrazing and helps to maintain plant vigor for maximum yields.

The potential of this soil for production of pine trees is moderate. The main concerns in management are the limitations of the soil to use of equipment during wet periods, seedling mortality, and undesirable plant competition. Slash pine is the most suitable tree to plant for commercial wood production. For maximum productivity, a drainage system is needed to remove excess surface water.

Wetness and the poor filtering capacity of this soil are severe limitations to use for sanitary facilities. If the soil is used for sewage lagoons and sanitary landfills, the facilities should be sealed to help prevent seepage and possible contamination of ground water. Wetness also limits the use of this soil for building site development. Cutbanks may cave. Wetness and low fertility limit its use for lawns, landscaping, and golf course development. Species adapted to these conditions should be planted or a water control system should be installed. Plant nutrients should be regularly applied. The installation on an irrigation system should be considered so that water is available during dry periods. Fertilizer should be regularly applied.

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

8—Paola fine sand, 0 to 5 percent slopes. This soil is nearly level to gently sloping and excessively drained. It is on uneven side slopes and convex ridgetops on the uplands. The mapped areas are irregular in shape and range from 5 to 40 acres. The slopes are mainly 3 percent or more.

Typically, the surface layer is a mixture of white fine sand and finely divided organic material about 3 inches thick. The subsurface layer, to a depth of 26 inches, is white fine sand. The subsoil, to a depth of about 64 inches, is brownish yellow fine sand. The substratum to a depth of 80 inches is very pale brown fine sand.

Included with this soil in mapping are small areas of Astatula, Candler, Orsino, and Pomello soils that are similar to Paola soil. Also included are small areas of Paola soils that have slopes of between 5 and 8 percent. The included soils make up less than 15 percent of the map unit.

The water table is more than 72 inches below the surface throughout the year. Rain is rapidly absorbed if the surface is protected by a vegetative cover. Permeability is very rapid. The available water capacity is very low. Natural fertility is very low. Plant response to fertilizer is poor.

Typically, this Paola soil is characterized by the Longleaf Pine-Turkey Oak Hills range site. This site is on rolling land that is nearly level to strongly sloping. It is easily recognized by the landform and dominant vegetation of longleaf pine and turkey oak. The natural fertility of this site is very low as a result of the rapid movement of plant nutrients and water through the soil. The forage production and quality are poor, and cattle do not readily use this range site if other sites are available. Desirable forage on this site includes creeping bluestem, lopsided indiangrass, and low panicum.

This soil is not suited to cultivated crops because of droughtiness and the rapid leaching of plant nutrients. It is fairly suited to improved pasture. Grasses, such as pangolagrass and bahiagrass, must be well managed and fertilized.

The potential of this soil for production of pine trees is low. The main concerns in management are equipment use and seedling mortality. Sand pine is the most suitable tree to plant for commercial wood production.

Seepage and the poor filtering capacity of this soil are slight limitations to use as septic tank absorption fields. Special measures, such as sealing lagoons and regulating the density of septic tank absorption fields, are needed to control possible contamination of the ground water. This soil has few limitations for building site development, but cutbanks may cave. The droughty nature of this soil places severe limitations on its use for lawns, landscaping, and golf fairways. Species adapted to such conditions should be planted or an irrigation system should be installed to supply water during dry periods. Fertilizer should be applied as needed.

This Paola soils is in capability subclass VIs. The woodland ordination symbol for this soil is 2S.

9—Pompano fine sand. This soil is nearly level and poorly drained. It is adjacent to poorly defined drainageways and is in broad, flat, low areas throughout the county. The mapped areas are irregular in shape, long and narrow, or nearly circular and range from 5 to about 200 acres. The slopes are less than 2 percent.

Typically, the surface layer is black fine sand about 5 inches thick. The underlying material to a depth of 80 inches is light brownish gray and light gray fine sand.

Included with this soil in mapping are small areas of Adamsville and Basinger soils. Also included are soils that are similar to Pompano soil but have an organic layer 2 to 6 inches thick; soils that have a surface layer more than 20 inches thick; and soils that have a sandy loam subsoil layer at a depth of more than 40 inches. The included soils make up less than 20 percent of the map unit.

The water table is within 10 inches of the surface layer for 2 to 6 months. It is more than 30 inches below the surface during extended dry periods. This soil has slow internal drainage. Permeability is rapid, and runoff is slow. The available water capacity is very low. Reaction ranges from very strongly acid to mildly alkaline. Natural fertility is low. Plant response to fertilizer is moderate.

Typically, this Pompano soil is in the Slough range site. This site can be identified by an open expanse of grasses, sedges, and rushes in an area that is saturated during the rainy season. If grazing is controlled, the potential of this site for forage production is almost as high as it is in the Freshwater Marshes and Ponds range site. Desirable forage plants on this site include blue maidencane, maidencane, chalky bluestem, toothachegrass, and South Florida bluestem. Carpetgrass, an introduced plant, tends to dominate the site if it is excessively grazed.

This soil is poorly suited to cultivated crops. A water control system that includes surface or subsurface drains is needed to remove excess water during wet seasons. In dry seasons, an irrigation system is needed because of the low available water capacity of the soil. Row crops on the contour in alternate strips with close-growing cover crops help control erosion. A crop rotation system is needed that keeps the soil covered with close-growing, soil-improving crops three-fourths of the time. Bedding in rows is sometimes necessary to lower the depth of the water table. Fertilizer and lime should be applied according to the need of the crop.

This soil is well suited to improved pasture if the surface water can be controlled. Pangolagrass, improved bahiagrasses, and white clover will grow well if managed properly. Surface ditches or a subsurface drainage system is needed to remove excess surface water. Regular applications of fertilizer should be applied as needed. Controlled grazing helps to maintain plant vigor for maximum yields.

This soil has a moderate potential for production of pine trees if a water control system, such as surface ditches, is installed to remove excess surface water. The major concerns in management are the severe limitations of this soil to use of equipment and the severe seedling mortality rate. If adequately drained, the seedling mortality rate can be reduced. Slash pine is the most suitable tree to plant for commercial wood production.

Wetness and the poor filtering capacity of this soil are severe limitations to use for sanitary facilities. Seepage and possible contamination of ground water require that sewage lagoons and sanitary landfills be sealed. Wetness also is a severe limitation for building site development. An adequate water control system should be installed. Cutbanks may cave. Wetness and droughty conditions during dry periods severely limit the use of this soil for lawns, landscaping, and golf fairways. Species adapted to these conditions should be planted, or a water control system to remove excess water or to provide irrigation during the dry periods should be installed. Fertilizer and lime should be regularly applied.

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

10—Pompano fine sand, depressional. This soil is nearly level and poorly drained. It is in depressions on the flatwood and in the river valley lowland parts of the county. The mapped areas are irregular in shape or somewhat circular and range from about 5 to 150 acres. The slopes are 2 percent or less.

Typically, the surface layer is a dark gray fine sand about 9 inches thick. The underlying material to a depth of 80 inches or more is light brownish gray, gray, and light gray fine sand.

Included with this soil in mapping are small areas of Adamsville, Basinger, EauGallie, Kanapaha, and Tavares soils. The included soils make up less than 20 percent of the map unit.

This soil is ponded for 3 to 9 months. In slightly elevated positions around the margins of the ponded areas, the water table is within 10 inches of the surface, and these areas are ponded in years of heavy rainfall. The water table is rarely at a depth of more than 10 inches. Permeability is rapid. The available water capacity is very low. Reaction ranges from very strongly acid to mildly alkaline. Natural fertility is low or very low. Plant response to fertilizer is moderate.

Typically, this Pompano soil is in 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 that is generally saturated or covered by surface water for 2 or more months during the year. If grazing is controlled, this range site has the potential to produce more forage than any of the other range sites in the county. Chalky bluestem and blue maidencane dominate the dry parts of the site, white maidencane is the dominant plant in the wet parts. Other desirable forage on this site includes cutgrass, bluejoint panicum, sloughgrass, and low panicums. Periodic high water levels provide neutral deferment from cattle grazing if grazing is not properly controlled. Carpetgrass, an introduced plant, tends to dominate the dry parts of the site if it is excessively grazed.

This soil is not suited to cultivated crops or improved pasture because of ponding. Water control systems are difficult to establish because suitable outlets are not available and because of the position of the soil on the landscape.

This soil has a moderate potential for the production of pine trees if a surface or subsurface drainage system can be installed to remove excess surface water. Limitations to use of equipment on this soil are severe. The seedling mortality rate and competition from undesirable plants are also severe. These limitations are the main concerns in management.

Ponding of this soil and the difficulty of controlling wetness severely limit the use of this soil for urban development.

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

11—Tavares fine sand, 0 to 5 percent slopes. This soil is nearly level to gently sloping and moderately well drained. It is on knolls and ridges throughout the county and on lower ridges on the uplands. The mapped areas are long and narrow or somewhat circular and range from about 5 to 200 acres. The slopes are 5 percent or less.

Typically, this soil is fine sand throughout. The surface layer is dark grayish brown about 3 inches thick. The upper part of underlying material, to a depth of 63 inches, is very pale brown. The lower part to a depth of 80 inches is white.

Included with this soil in mapping are small areas of Adamsville, Candler, and Lake soils. Also included are small areas of soils that are similar to Tavares soil but have a few limestone boulders at a depth of about 60 inches or more. The included soils make up about 20 percent of the map unit.

The water table is between depths of 40 and 72 inches for up to 6 months. Permeability is rapid or very rapid. The available water capacity is very low. The soil becomes droughty during periods of low rainfall. Reaction ranges from extremely acid to medium acid in the surface layer and from very strongly acid to medium acid in the other layers. Natural fertility is low. Plant response to fertilizer is moderate.

Typically, this Tavares soil is in the Longleaf Pine-Turkey Oak Hills range site. This site is on rolling land that is nearly level to strongly sloping. It is easily recognized by the landform and dominant vegetation of longleaf pine and turkey oak. The natural fertility of this site is low as a result of the rapid movement of plant nutrients and water through the soil. The forage production and quality are poor, and cattle do not readily use this range site if other sites are available. Desirable forage on this site includes creeping bluestem, lopsided indiangrass, and low panicum.

Droughtiness and rapid leaching of plant nutrients severely limit the use of this soil for cultivated crops. Few crops are adapted to these conditions, and potential yields are low. Row crops planted on the contour in alternate strips with close-growing cover crops help control erosion. A crop rotation system is needed that keeps the soil covered with close-growing crops at least two-thirds of the time. Soil-improving crops and crop residue left on the soil help maintain or increase the content of organic matter in the soil. Regular applications of fertilizer and lime should be applied according to the need of the crop. Irrigation should be provided if crop value warrants.

This soil is well suited to improved pasture. Pangolagrass, Coastal bermudagrass, and bahiagrasses are well adapted. Regular applications of fertilizer are needed. Controlled grazing helps to maintain plant vigor for maximum yields.

This soil has a moderately high potential for the production of pine trees. The main concerns in management are moderate limitations of the soil to use of equipment and the moderate seedling mortality rate. Slash pine is the most suitable tree to plant for commercial wood production.

Wetness is a moderate limitation to use of this soil as septic tank absorption fields. If the soil is used for sanitary landfills or sewage lagoons, the facilities should be sealed to help prevent seepage and contamination of the ground water. The limitations for most building site development are slight to moderate, however, cutbanks may cave. Droughtiness and low fertility are severe limitations to use of this soil for landscaping. Species adapted to these conditions should be planted or an irrigation system should be installed to supply water during dry periods. Fertilizers should be applied as needed.

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

12—Immokalee fine sand. This soil is nearly level and poorly drained. It is in broad flatwood areas and also occurs as scattered, transitional areas between the elevated, better drained soils and the more poorly drained, ponded soils throughout the county. The mapped areas are irregular in shape and range from 5 to 50 acres. The slopes are 2 percent or less.

Typically, the surface layer is black fine sand about 6 inches thick. The subsurface layer, to a depth of 33 inches, is light brownish gray fine sand. The subsoil extends to a depth of 52 inches. It is very dark grayish brown and dark reddish brown fine sand. The sand grains in the subsoil are coated with finely divided organic material. The substratum to a depth of 80 inches is light brownish gray and light gray fine sand.

Included with this soil in mapping are small areas of Basinger, EauGallie, Myakka, and Pompano soils. Also included are small areas of soils that are similar to

Immokalee soil but have limestone bedrock at a depth of more than 60 inches. The included soils make up about 20 percent of the map unit.

The water table is at a depth of less than 10 inches for 2 months. It recedes between depths of 10 and 40 inches for 8 months or more and is at a depth of more than 40 inches during dry periods. Internal drainage is slow. Permeability is moderate in the subsoil and rapid in the other layers. The available water capacity is moderate in the subsoil and low or very low in the other layers. Reaction ranges from very strongly acid to medium acid. Natural fertility is low. Plant response to fertilizer is moderate.

Typically, this Immokalee soil is in the South Florida Flatwoods range site. This site can be identified by scattered pine trees that have an understory of saw palmetto and grasses. If grazing is controlled, this range site has the potential to produce significant amount of creeping bluestem, lopsided indiangrass, chalky bluestem, and various panicum species. If the range deteriorates as a result of poor grazing management, saw palmetto and pineland threeawn (wiregrass) will dominate the site.

This soil is fairly suited to cultivated crops. The installation of surface ditches or a subsurface drainage system to remove excess water during wet periods and provide water through irrigation during dry periods can increase the suitability of this soil for crops commonly grown in this county. Row crops planted on the contour in alternate strips with close-growing crops help control erosion. A cropping system is needed that keeps the soil covered with close-growing, soil-improving crops three-fourths of the time. Crop residue left on the surface increases or helps to maintain the content of organic matter in the soil. For some crops, bedding in rows is sometimes necessary to lower the depth of the water table. Regular applications of fertilizer and lime should be applied according to the need of the crop.

This soil is well suited to improved pasture. Pangolagrass, improved bahiagrasses, and white clover grow well if properly fertilized and limed and if grazing is controlled. Overgrazing results in weak plants.

This soil has a moderate potential for the production of pine trees. The moderate limitations of this soil to use of equipment and the seedling mortality rate are moderate concerns in management. Slash pine is the most suitable tree to plant for commercial wood production.

This soil is poorly suited to urban and recreational uses. Wetness and seepage are severe limitations to use of this soil for sanitary facilities. Wetness also is a severe limitation to use for building site development. Cutbanks may cave. Wetness must be controlled if the soil is used for landscaping and lawns. An irrigation system is needed during the droughty periods.

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

13—Okeelanta muck. This soil is nearly level and very poorly drained. It is in depressions and freshwater coastal swamps. It receives drainage from other soils and retains the water for long periods. The mapped areas are irregular in shape and range from about 5 to 150 acres. The slopes are less than 2 percent.

Typically, the surface layer is well decomposed, black muck about 8 inches thick. Below that layer, very dark gray muck extends to a depth of 35 inches, and very dark grayish muck extends to a depth of 38 inches. The underlying material to a depth of 80 inches or more is light grayish brown and light gray fine sand.

Included with this soil in mapping are small areas of depressional phases of Basinger, EauGallie, and Pompano soils and some small areas of Lauderhill and Terra Ceia soils. The included soils make up about 25 percent of the map unit.

This soil is ponded for 6 to 12 months. The water table recedes to a depth of less than 10 inches during dry periods. Internal drainage is slow. The organic material is exposed to oxidation by the removal of the water, and subsidence occurs. With continued artificial drainage for an extended period, only a small part of the original organic surface layer may remain, and the mineral layer may be near the surface or exposed. Permeability is rapid. The organic material is highly absorbent and has a very high available water capacity. The underlying sands have a low or very low available water capacity. Natural fertility is moderate. Plant response to fertilizer is very good.

Typically, this Okeelanta soil is in 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 that is generally saturated or covered by surface water for 2 or more months during the year. If grazing is controlled, this range site has the potential to produce more forage than any of the other range sites in the county. Chalky bluestem and blue maidencane dominate the dry parts of the site, while maidencane is the dominant plant in the wet parts. Other desirable forage on this site includes cutgrass, bluejoint panicum, sloughgrass, and low panicums. Periodic high water levels provide natural deferment from cattle grazing if grazing is not properly controlled. Carpetgrass, an introduced plant, tends to dominate the dry parts of the site if it is excessively grazed.

The vegetation on this soil provides excellent habitat for many wildlife species. Many birds and waterfowl winter in the county, and some inhabit the area year-round. Large animals periodically also come into the area to feed.

If adequately drained, this soil is well suited to the production of vegetables and other crops. In some locations, the installation of a drainage system is impractical or very costly because suitable outlets are not available. If a water control system can be installed, it should include surface ditches or a subsurface drainage system to remove excess water and to help prevent ponding; it should not remove so much water that the soil will decompose and cause excessive subsidence; it should allow for the regulation of the water table depth so that it is slightly below the root zone of the crop grown on the soil; and it should also keep the soil saturated when crops are not being grown to limit subsidence and to control some plant diseases. Water-tolerant cover crops should be planted if row crops are not on the soil. Crop residue and soil-improving cover crops left on the soil increase the content of organic matter in the soil. Lime and fertilizer that contain phosphates and potash should be applied according to the need of the crop.

This soil is moderately suited to improved pasture. Most improved grasses and clover that are adapted to the area grow well on this soil if the water is properly controlled. Surface ditches or subsurface drains can help control ponding and can also help keep the water table near the surface to prevent excessive oxidation of the soil. Fertilizer that contains potash, phosphorous, and other minor elements should be applied as needed.

This soil is not suited to commercial production of pine trees.

This soil has severe limitations for all urban uses. Ponding is a major limitation. In addition, seepage and the poor filtering capacity of the underlying sandy material severely limit the use of this soil for most sanitary facilities. Subsidence of the organic material prohibits most building site development. If the soil is artificially drained and fill material is placed over the organic material, buildings can crack and distort as the organic material subsides.

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

14—Lake fine sand, 0 to 5 percent slopes. This soil is nearly level to gently sloping and excessively drained. It is on the upland ridges. The mapped areas are irregular in shape or somewhat circular and range from about 5 to 500 acres.

Typically, the surface layer is dark brown fine sand about 7 inches thick. The underlying material to a depth of 80 inches or more is yellowish brown and brownish yellow fine sand.

Included with this soil in mapping are small areas of Arredondo, Astatula, Candler, and Tavares soils. Also included are small areas of Lake soils that have slopes of 5 to 9 percent. The included soils make up less than 20 percent of the map unit.

The water table is more than 80 inches below the surface throughout the year. Internal drainage is rapid. The available water capacity is low or very low. Reaction is very strongly acid or strongly acid except where lime has been applied. Natural fertility is low. Plant response to fertilizer is poor.

Typically, this Lake soil is in the Longleaf Pine-Turkey Oak Hills range site. This site is on rolling land that is nearly level to strongly sloping. It is easily recognized by the landform and dominant vegetation of longleaf pine and turkey oak. The natural fertility of this site is low as a result of the rapid movement of plant nutrients and water through the soil. The forage production and quality are poor, and cattle do not readily use this range site if other sites are available. Desirable forage on this site includes creeping bluestem, lopsided indiangrass, and low panicum.

Droughtiness and low fertility severely limit the use of this soil for cultivated crops. Intensive management is necessary for the production of adapted crops. Yields are reduced by periodic droughts. Row crops planted on the contour in alternate strips with close-growing crops help control erosion. A crop rotation system is needed that keeps the soil covered with soil-improved, close-growing crops at least three-fourths of the time. Soil-improving crops and crop residue left on the soil help maintain the content of organic matter and the available water capacity of the soil. An irrigation system, if feasible, should be considered if the value of the crop warrants.

This soil is moderately suited to improved pasture if deep-rooted plants, such as Coastal bermudagrass and bahiagrasses, are grown. Regular application of fertilizer and lime is needed. Controlled grazing protects the soil surface and helps to maintain plant vigor for maximum yields.

This soil has a moderately high potential for the production of pine trees. Moderate concerns in management are equipment use and seedling mortality. Slash pine is the most suitable to plant for commercial wood production.

This soil has slight limitations to use as septic tank absorption fields. Seepage is a severe limitation to use for sewage lagoons or sanitary landfills. A dense concentration of septic tank absorption fields can contaminate ground water. If the soil is used for sewage lagoons or sanitary landfills, the facilities should be sealed to help prevent seepage. Limitations for most building site development are slight; however, cutbanks may cave. If the soil is used for landscaping, species adapted to droughty, low fertility conditions should be planted or an irrigation system should be installed to supply water during dry periods. Fertilizer should be applied as needed.

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

15—Lake fine sand, 5 to 8 percent slopes. This soil is moderately sloping and excessively drained. It is on side slopes on the uplands. The mapped areas are irregular in shape and range from 5 to 50 acres.

Typically, the surface layer is dark brown fine sand 8 inches thick. The underlying material to a depth of 80 inches or more is yellowish brown, strong brown, and reddish yellow fine sand.

Included with this soil in mapping are small areas of Arredondo, Astatula, Candler, and Tavares soils. Also included are small areas of Lake soils that have slopes of less than 5 percent and small areas of Lake soils that have slopes of up to 12 percent. The included soils make up less than 20 percent of the map unit.

The water table is more than 80 inches below the surface throughout the year. Internal drainage is rapid. The available water capacity is low or very low. Reaction is very strongly acid or strongly acid except where lime has been applied. Natural fertility is low. Plant response to fertilizer is moderate.

Typically, this Lake soil is in the Longleaf Pine-Turkey Oak Hills range site. This site is on rolling land that is nearly level to strongly sloping. It is easily recognized by the landform and dominant vegetation of longleaf pine and turkey oak. The natural fertility of this site is low as a result of the rapid movement of plant nutrients and water through the soil. The forage production and quality are poor, and cattle do not readily use this range site if other sites are available. Desirable forage includes creeping bluestem, lopsided indiangrass, and low panicum.

This soil is not suited to cultivated crops. Droughtiness, low fertility, and slope severely limit the use of this soil for crop production. Erosion is a severe hazard.

This soil is moderately suited to improved pasture if adapted, deep-rooted plants, such as Coastal bermudagrass and bahiagrasses, are grown. Yields are low during periodic droughts. Controlled grazing helps to maintain plant vigor for maximum yields and protects the soil by keeping vegetation on the surface. Regular applications of fertilizer and lime are needed. Controlled grazing helps to maintain plant vigor for maximum yields and protects the soil by keeping vegetation on the surface.

This soil has a moderately high potential for the production of pine trees. Moderate concerns in management are equipment use and seedling mortality. Slash pine is the most suitable tree to plant for commercial wood production.

This soil has slight limitations to use as septic tank absorption fields. Seepage is a severe limitation to use for sewage lagoons or sanitary landfills. A dense concentration of septic tank absorption fields can contaminate the ground water. If the soil is used for sewage lagoons and sanitary landfills, the facilities should be sealed to help prevent seepage. Limitations to use for most building site development are slight. Slope is a moderate limitation for small commercial buildings. Cutbanks may cave. If the soil is used for landscaping, species adapted to droughty, low fertility conditions should be planted or an irrigation system should be installed to supply water during dry periods. Fertilizer should be applied as needed.

This Lake soil is in capability subclass VIs. The woodland ordination symbol for this soil is 10S.

16—Arredondo fine sand, 0 to 5 percent slopes. This soil is nearly level to gently sloping and well drained. It is on upland ridges. The mapped areas are mainly oblong and range from 5 to 200 acres.

Typically, the surface layer is very dark grayish brown fine sand 9 inches thick. The subsurface layer, to a depth of 41 inches, is dark yellowish brown and yellowish brown fine sand. The upper part of the subsoil, to a depth of 65 inches, is strong brown loamy fine sand. The lower part to a depth of 80 inches is strong brown sandy clay loam.

Included with this soil in mapping are small areas of Apopka, Candler, Kendrick, Lake, and Sparr soils. Also included are small areas of Arredondo soils that have slopes of up to 9 percent. The included soils make up less than 20 percent of the map unit.

The water table is more than 6 feet below the surface in most years. A perched water table is on the top of the subsoil for 2 days or less following heavy rains. Rain is rapidly absorbed, and runoff is slow if the surface layer is vegetated. Permeability is rapid in the sandy layers and moderate to slow in the loamy layers. The available water capacity is low to moderate in the sandy layers and moderate in the loamy layers. The soil is droughty during periods of low rainfall. Reaction ranges from very strongly acid to medium acid except where lime has been applied. Natural fertility is moderate to low. Plant response to fertilizer is good.

Typically, this Arredondo soil is in the Longleaf Pine-Turkey Oak Hills range site. This site is on rolling land that is nearly level to strongly sloping. It is easily recognized by the landform and dominant vegetation of longleaf pine and turkey oak. The natural fertility of this site is low as a result of the rapid movement of plant nutrients and water through the soil. The forage production and quality are poor, and cattle do not readily use this range site if other sites are available. Desirable forage on this site includes creeping bluestem, lopsided indiangrass, and low panicum.

This soil is poorly suited to cultivated crops. The soil is droughty, and plant nutrients are rapidly leached. A well designed program of soil-improving practices will give the best results. Row crops planted in alternate strips with close-growing crops help control erosion. A crop rotation system is needed that keeps the soil covered with soil-improving, close-growing cover crops at least two-thirds of the time. Soil-improving crops and crop residue left on the surface improve soil quality and increase the content of organic matter in the soil. Fertilizer and lime should be applied according to the need of the crop. Crop value may make irrigation feasible if water is readily available.

This soil is well suited to pasture and hay crops if deep-rooted plants, such as Coastal bermudagrass and bahiagrasses are grown. They must be properly fertilized and limed. Controlled grazing protects the soil surface and helps to maintain plant vigor for maximum yields. Overgrazing can greatly reduce yields, especially, if the plants have been exposed to drought or severe frost.

This soil has a moderately high potential for the production of pine trees. The primary concerns in management include equipment use and plant competition. Slash pine is the most suitable tree to plant for commercial wood production.

This soil has slight limitations to use as septic tank absorption fields. The sandy nature of the soil allows for seepage from sewage lagoon and sanitary landfill facilities that are not lined or sealed. Limitations for dwellings and commercial buildings are slight, but cutbanks may cave. The unfavorable sandy features of this soil severely limit its use for landscaping, lawn, and golf course development. For these uses, an irrigation system is generally needed, and fertilizer and lime should be frequently applied.

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

17—Arredondo fine sand, 5 to 8 percent slopes. This soil is moderately sloping and well drained. It is on the side slopes of the upland ridges. The mapped areas are irregular in shape and are generally less than 50 acres.

Typically, the surface layer is very dark gray fine sand 3 inches thick. The subsurface layer, to a depth of 54 inches, is light yellowish brown, brownish yellow, and very pale brown fine sand. The upper part of the subsoil, to a depth of 57 inches, is strong brown loamy fine sand. The middle part, to a depth of 77 inches, is strong brown sandy clay loam and sandy clay. The lower part to a depth of 97 inches is reddish yellow loamy fine sand.

Included with this soil in mapping are small areas of Apopka, Candler, Kendrick, Lake, and Sparr soils. Also included are small areas of Arredondo soils that have slopes of less than 5 percent and small areas of Arredondo soils that have slopes of up to 12 percent. The included soils make up about 20 percent of the map unit.

The water table is more than 72 inches below the surface throughout the year. In a few areas, a perched water table is on the top of the subsoil for less than 2 days following intense rains. Rain is rapidly absorbed if the surface layer is protected by vegetation. A moderate erosion hazard exists on unprotected areas as a result of runoff during heavy rains. Permeability is rapid in the sandy layers and moderate to slow in the loamy layers. The available water capacity is low to moderate in the sandy layers and moderate in the loamy layers. The soil is droughty during periods of low rainfall. Reaction ranges from very strongly acid to medium acid except where lime has been applied. Natural fertility is moderate to low. Plant response to fertilizer is good.

Typically, this Arredondo soil is in the Longleaf Pine-Turkey Oak Hills range site. This site is on rolling land that is nearly level to strongly sloping. It is easily recognized by the landform and dominant vegetation of longleaf pine and turkey oak. The natural fertility of this site is low as a result of the rapid movement of plant nutrients and water through the soil. The forage production and quality are poor, and cattle do not readily use this range site if other sites are available. Desirable forage on this site includes creeping bluestem, lopsided indiangrass, and low panicums.

This soil is poorly suited to cultivated crops. Droughtiness and the rapid leaching of plant nutrients are limitations. Erosion is a moderate hazard. Row crops planted on the contour in alternate strips with close-growing crops help control erosion. A crop rotation system is needed that keeps the soil covered with close-growing, soil-improving crops at least three-fourths of the time. Crop residue and soil-improving crops left on the soil improve soil quality and maintain or increase the content of organic matter in the soil. Fertilizer and lime should be applied according to the need of the crop.

This soil is moderately well suited to pasture and hay crops if deep-rooted plants, such as Coastal bermudagrass and bahiagrasses, are grown. They must be properly fertilized and limed. Drought and frost periodically reduce plant growth. Controlled grazing protects the soil surface and helps to maintain plant vigor. Overgrazing can result in low yields, and vegetation on the soil surface is reduced.

This soil has a moderately high potential for the production of pine trees. The primary concerns in management include equipment use and plant competition. Slash pine is the most suitable tree to plant for commercial wood production.

This soil has slight limitations to use as septic tank absorption fields. The sandy nature of the soil allows for seepage from sewage lagoons and sanitary landfills facilities that are not lined or sealed. Limitations for dwellings are slight. Slope is a moderate limitation for commercial buildings. In addition, cutbanks may cave. This soil has severe limitations to use for landscaping, lawns, and golf course development. For these uses, an irrigation system is generally needed, and fertilizer and lime should be frequently applied.

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

18—Kendrick fine sand, 0 to 5 percent slopes. This soil is nearly level to gently sloping and well drained. It is on upland ridges. The mapped areas are irregular in shape and range from 5 to 200 acres. The slopes are smooth to concave.

Typically, the surface layer is dark grayish brown fine sand about 4 inches thick. The subsurface layer, to a depth of 28 inches, is yellowish brown and brownish yellow fine sand. The upper part of the subsoil, to a depth of 34 inches, is yellowish brown fine sandy loam. The middle part, to a depth of 63 inches, is yellowish brown and strong brown sandy clay. The lower part to a depth of 80 inches is mottled strong brown, dark red, and light gray sandy clay loam.

Included with this soil in mapping are small areas of Arredondo, Lochloosa, Micanopy, and Williston soils. Also included are small areas of Kendrick soils that have slopes of 5 to 8 percent. The included soils make up about 20 percent of the map unit.

In most years, the water table is more than 6 feet below the surface throughout the year. Permeability is rapid in the sandy layers and moderately slow or slow in the subsoil. The available water capacity is low to moderate in the sandy layers and high in the subsoil. Reaction is very strongly acid or strongly acid except where lime has been applied. Natural fertility is low. Plant response to fertilizer is good.

Typically, this Kendrick soil is in the Upland Hardwood Hammock range site. This site is readily identified by the dense canopy of oaks, magnolias, and hickories. Cattle use the areas where the canopy is dense for shade and resting. Desirable forage on this site includes indiangrass, switchgrass, longleaf uniola, and chalky bluestem.

This soil is moderately suited to cultivated crops. The main limitation is periodic droughtiness. Erosion is a hazard. Row crops planted on the contour and in alternate strips with close-growing cover crops help control erosion. A crop rotation system is needed that keeps the soil covered with soil-improving, close-growing cover crops at least half the time. Crop residue and soil-improving crops left on the soil increase the content of organic matter in the soil. Fertilizer and lime should be applied according to the need of the crop. If crop value warrants, irrigation will ensure maximum yields.

This soil is moderately suited to improved pasture. Pangolagrass and bahiagrass grow well if properly fertilized and limed. Controlled grazing will help obtain maximum yields and maintain a good ground cover to protect the soil surface.

This soil has high potential for the production of pine trees. Moderate concerns in management are equipment use, seedling mortality, and undesirable plant competition. Slash pine is the most suitable tree to plant for commercial wood production.

The permeability of the subsoil is a moderate limitation to use of this soil as a septic tank absorption fields. This soil has slight limitations to use for trench sanitary landfills. If used for area sanitary landfills or sewage lagoons, the facilities should be sealed to help prevent seepage. The limitations for most building site developments are slight; but cutbanks may cave. Droughtiness is a moderate limitation to use of this soil for lawns, landscaping, and golf fairways. Species adapted to low fertility and droughty conditions should be planted. The installation of an irrigation system is often necessary, and fertilizer should be applied as needed.

This Kendrick soil is in capability subclass IIe. The woodland ordination symbol for this soil is 11S.

19—Kendrick fine sand, 5 to 8 percent slopes. This soil is moderately sloping and well drained. It is on upland ridges. The mapped areas are irregular in shape and range from 5 to about 100 acres. The slopes are smooth to concave.

Typically, the surface layer is very dark brown fine sand 5 inches thick. The subsurface layer, to a depth of 26 inches, is brown and yellowish brown fine sand. The upper part of the subsoil, to a depth of 30 inches, is yellowish brown sandy loam. The middle part, to a depth of 56 inches, is dark yellowish brown sandy clay loam. The lower part to a depth of 80 inches is mottled strong brown, dark red, and light gray sandy clay loam.

Included with this soil in mapping are small areas of Arredondo, Lochloosa, Sparr, and Williston soils. Also included are small areas of Kendrick soils that have slopes of 0 to 5 percent and small areas of Kendrick soils that have slopes of up to 10 percent. The included soils make up about 20 percent of the map unit.

In most years, the water table is more than 6 feet below the surface throughout the year. Permeability is rapid in the sandy layers and moderately slow to slow in the subsoil. The available water capacity is low in the sandy layers and moderate in the subsoil. The erosion hazard is severe. Runoff during rainfall is rapid in unprotected areas. Reaction is very strongly acid or strongly acid except where lime has been applied. Natural fertility is low. Plant response to fertilizer is good.

Typically, this Kendrick soil is in the Upland Hardwood Hammock range site. This site is readily identified by the dense canopy of oaks, magnolias, and hickories. Cattle use the areas where the canopy is dense for shade and resting. Desirable forage on this site includes indiangrass, switchgrass, longleaf uniola, and chalky bluestem.

This soil is moderately suited to cultivated crops. The main concern in management is the erosion hazard. This hazard can be reduced by planting row crops on the contour and in alternate strips with close-growing cover crops. A crop rotation system is needed that keeps the soil covered with soil-improving, close-growing cover crops at least half the time. Crop residue and soil-improving crops left on the soil increase the content of organic matter in the soil. Fertilizer and lime should be appled according to the need of the crop.

This soil is well suited to improved pasture. Coastal bermudagrass and improved bahiagrasses are well adapted and provide good cover to the soil if well managed. Fertilizer and lime should be applied according to the need of the crop. Controlled grazing helps to maintain plant vigor for maximum yields and to keep a good ground cover on the surface.

This soil has a high potential for the production of pine trees. Moderate concerns in management are equipment use, seedling mortality, and undesirable plant competition. Slash pine is the most suitable tree to plant for commercial wood production.

The permeability of the subsoil is a moderate limitation to use of this soil as septic tank absorption fields. This soil has slight limitations to use for trench sanitary landfills. If used for area sanitary landfills or sewage lagoons, the facilities should be sealed to help prevent seepage. Slope is a moderate limitation to use of this soil for commercial buildings; but limitations are slight for other building site development. Cutbanks may cave. If the soil is used for development of lawns, landscaping, or golf courses, periodic droughtiness is a moderate limitation. Species adapted to low fertility and droughty conditions should be planted. The installation of an irrigation system may be necessary, and fertilizer should be applied as needed.

This Kendrick soil is in capability subclass IIIe. The woodland ordination symbol for this soil is 11S.

20—Pits. This map unit consists of irregularly-shaped, open Pits from which the soil and other materials have been mined or excavated. The mined material was mainly limestone and phosphate; but in some areas, sand and other soil material were removed. These excavations are 5 to 50 feet below the surrounding natural ground level. The walls are strongly sloping to nearly vertical and consist of exposed layers of sand and other soil material and, frequently, bedrock.

In most areas, the bottoms of the Pits consist of a highly variable mixture of smooth to strongly sloping sand and geologic materials. These materials may contain scattered limestone boulders or limestone bedrock, or both. In areas where the Pits have been excavated to near ground water level, they retain water for variable periods and have a seasonal high water table. Some Pits are permanent bodies of water and, if large enough, are shown on the soil maps as water. In these areas, fish and other wildlife have become established. Other Pits have exposed bedrock.

Where excavation operations are active or recent, the Pits are not vegetated. A succession of vegetation by various plant species native to the area are in abandoned Pits. Initial vegetation generally consists of scattered annual weed species and grasses. Over time, a population of trees and shrubs develops. The plants in the drier Pits are similar to plants on well drained to excessively drained landscapes. Wetter Pits have a vegetation of more water-tolerant species.

The variability of the material in the Pits does not permit the establishing of suitabilities for various uses. The walls of the Pits may need reworking and stabilization to prevent erosion and caving. If the Pits were excavated to near ground water level, ground water contamination can be a hazard. This can occur if they are not sealed before using them as a dump for hazardous materials, or ground water contamination can occur if the Pits receive contaminated runoff water. Vegetated Pits are generally an excellent habitat for wildlife; and if surrounded by urbanized areas, they act as a buffer zone for wildlife.

Pits were not assigned to a capability subclass or to a woodland group.

22—Quartzipsamments, 0 to 5 percent slopes. This soil is nearly level to gently sloping. It has been reworked and shaped by earthmoving equipment. This map unit commonly is adjacent to urban lands but can occur throughout the county. Many areas of this soil were formerly sloughs, marshes, shallow ponds, or other areas of standing water. These areas have been filled with sandy soil material to the level of the surrounding landscape, or higher. In a few areas, this soil originally was on the high ridges that were excavated to below natural ground level. Smoothing and shaping have made the soil better suited to use as sites for buildings, roads and streets, recreation areas, and other related uses.

The color and thickness of the various layers of this soil are variable. One of the more common profiles has a surface layer of mottled brownish yellow and pale brown fine sand 54 inches thick. The upper part of the underlying material, to a depth of 59 inches, is dark gray fine sand. The lower part to a depth of 80 inches is brownish yellow fine sand.

Included with this soil in mapping are small areas of Basinger and Immokalee soils that have not been disturbed. Also included are small areas that have less than 20 inches of fill material on the surface, and areas where small amounts of soil material, such as sandy loam, sandy clay loam, and sandy clay, are mixed with the sand. Scattered fragments of hard limestone are in some places. The included soils generally make up less than 20 percent of the map unit.

The depth to the water table is variable, but it ranges from about 20 inches to more than 72 inches depending on the thickness of the fill material and drainage of the underlying soil. In most excavated areas, the water table is at a depth of more than 72 inches. Permeability is variable, but generally it is very rapid. The available water capacity is also variable, but generally it is very low. Natural fertility is very low.

In most parts of the county, the soil has slight limitations to use as septic tank absorption fields if sufficient fill material has been added to lower the water table to a suitable depth. If the fill layer is too thin and the area was formerly a ponded site, this soil has severe to moderate limitations to use as septic tank absorption fields if a drainage system has not been installed to remove the excess water. Seepage is a severe limitation if this sandy soil is used for sanitary landfills or sewage lagoons unless the facilities are sealed to help prevent ground water contamination. In most areas, the limitations of this soil for dwellings and commercial buildings are slight, but cutbanks may cave. In areas where the water table is too shallow, this soil has severe limitations for structures with basements. Droughtiness and the very low natural fertility severely limit the use of this soil for lawns, landscaping, and golf course development. Species adapted to very low fertility and droughty conditions should be planted. An irrigation system to supply water during dry periods is needed. Fertilizer should be applied as needed.

This soil has not been assigned to a capability subclass or to a woodland group.

23—Weekiwachee-Durbin mucks. This complex consists of very poorly drained, well decomposed organic soils that contain sulfur. These soils are along the coast at about sea level. They are in broad, flat, tidal marshes. The soil area is a transition zone between freshwater and marine water.

Weekiwachee soil mainly is in the interior of the map unit and in those parts that are adjacent to mineral soils or rock outcrop. Durbin soil mainly is exposed to open water and along tidal flood channels and streams. The mapped areas range from small, isolated islands of about 4 acres to broad, extensive areas of several hundred acres. The individual areas of the soils in this map unit are too mixed or too small to map separately at the scale used for the maps in the back of this publication.

Weekiwachee soil makes up about 45 percent of the map unit but ranges from 20 to 80 percent in individual delineations. Small, isolated delineations generally have a higher percentage of this soil. Durbin soil makes up about 40 percent of the map unit but ranges from 10 to 50 percent in individual delineations. The included soils make up about 15 percent of the map unit.

Typically, Weekiwachee soil has a surface layer of black muck that extends to a depth of 34 inches. The underlying material, to a depth of 38 inches, is gray fine sand. The next layer, to a depth of 41 inches, is white, soft limestone bedrock that is easily broken with hand tools. The soft limestone bedrock is underlain by hard limestone bedrock.

Durbin soil has a surface layer that is very dark gray muck about 7 inches thick. Below the surface layer, black muck extends to a depth of 80 inches.

Included with these soils in mapping are small areas of Lauderhill, Okeelanta, and Terra Ceia soils. Also included are some small areas of rock outcrop and a soil near the inland areas that is similar to Weekiwachee soil. This soil has a sandy substratum up to 30 inches thick between the organic layers and the bedrock.

Most soils in this map unit are flooded daily at normal high tide. All soils in this map unit are flooded during storm tides. The organic soils remain nearly saturated between high tides. These soils are moderately rapidly permeable. The available water capacity is very high.

Typically, Weekiwachee and Durbin soils are in the Salt Marsh range site. This site can be identified by level, tidal marsh areas that have the potential to produce significant amounts of smooth cordgrass, haymarsh cordgrass, seashore saltgrass, and many other forage grasses and forbs.

Tidal action causes saltwater saturation of the soil and inundates the soils to a few inches above the surface layer. In some areas, these soils are soft and will not support the weight of a large animal. In areas that are suitable for grazing, the potential to produce desirable forage is almost as high as it is on a freshwater marsh. Poorly managed salt marshes are generally dominated by rushes and sawgrass.

The soils in this map unit support a wide variety of wildlife. They provide suitable habitat for many invertebrate species. These invertebrate species in turn serve as a foot source for many marine species. Freshwater fish and marine fish often share areas where the salinity of the water is diluted by incoming freshwater. These areas also provide habitat for the migratory bird and wading birds.

Wetness, organic matter content, sulfur content, salinity, and depth to bedrock limitations of these soils must be considered for any intended use. Flooding is a hazard.

The soils in this map unit are not suited to urban development, cultivated crops, improved pasture, rangeland, or commercial tree production. For any of these uses, flooding and wetness must be overcome. Extensive dikes would be needed to control tidal flooding. Because of the position of these soils on the landscape, suitable outlets for artificial drainage are not available, and a drainage system, such as pumps, is needed to control wetness. Even if a water control system could be developed, salinity of the soil and air would restrict plantings to salt-tolerant species. Drainage of these soils causes extreme acidity because of the oxidation of the contained sulfur.

The soils in this map unit are in capability subclass VIIIw, but they have not been assigned to a woodland group.

24—Okeelanta-Lauderhill-Terra Ceia mucks. This complex consists of nearly level, very poorly drained, well decomposed organic soils. These soils are in broad, freshwater swamps that parallel the coast. Most of the area is less than 5 feet above sea level, and limestone bedrock is frequently within 80 inches of the surface layer. Mineral soils on small, slightly elevated islands are adjacent to these organic soils. Poorly defined, small ponds and streams are common during dry periods. Water covers most of the area during wet periods. A few freshwater springs are present. The mapped areas range from 1 acre or less to about 10 acres. The individual areas of soils in this map unit are too mixed or too small to map separately at the scale used for the maps in the back of this publication.

Okeelanta soil makes up about 28 percent of the map unit. Lauderhill soil makes up about 25 percent. Terra Ceia soil makes up about 23 percent. The included soils make up about 24 percent of the map unit.

Typically, Okeelanta soil has a surface layer that is black muck about 8 inches thick. Below the surface layer, dark reddish brown muck extends to a depth of 32 inches. The underlying material to a depth of 80 inches is dark gray fine sand.

Typically, Lauderhill soil has a surface layer that is black muck about 9 inches thick. Below the surface layer, dark brown muck extends to a depth of 26 inches and is underlain by hard, white limestone bedrock.

Typically, Terra Ceia soil has a surface layer that is black muck about 8 inches thick. Below the surface layer, very dark brown muck extends to a depth of 80 inches.

Included with these soils in mapping are soils that have sandy, loamy, or mucky layers underlain by hard limestone bedrock at a depth of 3 to 20 inches. Also included are soils that are similar to Okeelanta and Terra Ceia soils that have limestone bedrock at a depth of more than 50 inches.

The soils in this complex are ponded for 6 to 12 months. The water recedes to a depth of less than 10 inches during dry periods and to a depth of more than 10 inches during extended periods of drought. Internal drainage is slow. Surface outlets are limited. Permeability is rapid in the organic layers and is very rapidly permeable in pedons that have sandy mineral layers. The available water capacity is very high in the organic layers and is low in the sandy mineral layers. Natural fertility is high. Vegetation is restricted to water-tolerant plants.

Most of the soils in this map unit remain in a dense, native forest vegetation of sweetgum, cypress, sweetbay, water-tolerant oaks, hickory, magnolia, paspalum and panicum grasses, cattails, and sawgrass (fig. 4).

The soils in this map unit are well suited to vegetables and certain other crops if water control can be established. Because of low elevations, the unavailability of suitable outlets, and the depth to bedrock, it is difficult to establish an adequate water control system. If practical, a water control system that includes surface ditches or subsurface drainage to remove excess water is needed to increase and maintain the root zone. When a crop is not on the soils, the drainage system should allow for the retention of water to inhibit subsidence. Water-tolerant cover crops should be grown and left on the surface to replace organic matter. Lime and fertilizer should be applied as needed.

If water can be properly controlled, the soils in this map unit are suited to improved pasture. Surface ditches and a subsurface drainage system are needed to remove standing water, but these drainage systems should be designed to retain sufficient water to prevent excessive oxidation of the organic material. Most improved grasses and clover that are adapted to the area grow well. Grazing should be controlled. Fertilizers should be applied according to the needs of the soils.

The soils in this map unit are not suited to use as rangeland because water stands on the soils for long periods and because forage production is low. These soils are also not suited to commercial pine tree production because of wetness.

The soils in this map unit have severe limitations for urban development. The water problem is difficult to overcome. In addition, the excess humus content and the depth to bedrock indicate that very costly measures would be needed to develop the area. The organic matter needs to be removed to eliminate possible subsidence and damage to buildings.

The soils in this map unit are in capability subclass VIIw. The woodland ordination symbol for these soils is 6W.

25—Lochloosa fine sand, 0 to 5 percent slopes. This soil is nearly level to gently sloping and somewhat poorly drained. It is in gently undulating areas on the upland ridges. The mapped areas mainly range from small areas of as much as about 15 acres to a few extensive areas of 200 acres or more.

Typically, the surface layer is grayish brown fine sand about 8 inches thick. The subsurface layer, to a depth of 27 inches, is brown and light yellowish brown fine sand. A few faint grayish brown mottles are in the lower 10 inches in the subsurface layer. The upper part of the subsoil, to a depth of 37 inches, is light yellowish brown fine sandy loam. The middle part, to a depth of 48 inches, is light brownish gray sandy clay loam. The lower part, to a depth of 63 inches, is gray clay. The substratum to a depth of 80 inches is light gray sandy clay loam.

Included with this soil in mapping are small areas of Broward, Kendrick, and Sparr soils. Also included are small areas of soils that are similar to Lochloosa soil but are more poorly drained. The included soils make up less than 20 percent of the map unit.

The water table is between depths of 30 and 60 inches for 1 month to 4 months. It may rise above 30 inches for periods of less than 3 weeks during periods of heavy rainfall. The water table is at a depth of more than 60 inches during dry periods. In some areas, side slopes are wet for longer periods because of seepage. Permeability is rapid or moderately rapid in the surface and subsurface layers and ranges from moderate to slow in the subsoil. The available water capacity is very low or low in the surface and subsurface layers and medium to high in the subsoil. Reaction is strongly acid to extremely acid except where lime has been applied. Natural fertility is low. Plant response to fertilizer is moderate.

Figure 4.—The natural vegetation on Okeelanta-Lauderhill-Terra Ceia mucks protects wetlands from erosion and provides an excellent habitat for wildlife.

Typically, this Lochloosa soil is in the Upland Hardwood Hammock range site. This site is readily identified by the dense canopy of oaks, magnolias, and hickories. Cattle use the areas where the canopy is dense for shade and resting. Desirable forage on this site includes indiangrass, switchgrass, longleaf uniola, and chalky bluestem.

This soil is moderately suited to a variety of crops if managed properly. A drainage system, such as surface ditches, is needed to reduce wetness and divert seepage from wet spots. Such a system is needed to control possible water erosion in the more sloping areas. Row crops planted on the contour help control erosion. A crop rotation system is needed that keeps the soil covered with soil-improving, close-growing cover crops at least two-thirds of the time. Crop residue left on the soil helps to control erosion and increases the content of organic matter in the soil. Fertilizer and lime should be applied according to the need of the crop.

This soil is moderately well suited to pastures of pangolagrass and bahiagrass. The installation of a well designed water control system, such as surface ditches, is needed to remove excess surface water and to control erosion on the more sloping areas. Crops respond well to periodic applications of fertilizer and lime and to the nutrients from the fertilizer. Controlled grazing helps to maintain plant vigor for maximum yields and protects the soil by keeping a vegetative cover on the surface. Grazing control is especially important if the plants have been exposed to frost or drought.

The dense canopy cover in the uncleared areas of this soil generally results in low production of grazing plants and limited use of the soil as native rangeland.

This soil has a high potential for the production of pine trees. Concerns in management are slight. Slash pine is the most suitable tree to plant for commercial wood production.

This soil has severe limitations for most urban uses. Wetness and seepage are major problems if this soil is used for sanitary facilities. A water control system, such as surface drainage ditches, is needed to remove excess water. All sanitary facilities should be designed to prevent environmental contamination. Sanitary landfills should be sealed to help prevent seepage. This soil has only slight limitations to use for most building site development if soil wetness can be overcome; however, cutbanks may cave.

This Lochloosa soil is in capability subclass IIw. The woodland ordination symbol for this soil is 11A.

26—Williston-Pedro-Rock outcrop complex, 2 to 5 percent slopes. This complex consists of well drained Williston and Pedro soils and limestone Rock outcrop. These soils are on upland ridges. They are underlain by limestone bedrock. Williston soil is near the outer edges of each mapped area. Pedro soil generally is on slightly higher elevations near the center of the mapped areas. Rock outcrop is throughout the map unit. The mapped areas are small and irregular in shape. They range from about 5 to 50 acres. The individual areas of the soils and Rock outcrop in this map unit are too mixed or too small to map separately at the scale used for the maps in the back of the publication.

Williston soil makes up about 40 percent of the map unit but ranges from about 35 to 60 percent in individual delineations. Pedro soil makes up about 30 percent. Rock outcrop makes up about 15 percent. Rock outcrop makes up about 15 percent. The included soils make up about 15 percent of the map unit.

Typically, Williston soil has a surface layer that is very dark gray loamy fine sand about 4 inches thick. Below that, dark brown loamy fine sand extends to a depth of 14 inches. The subsoil, to a depth of 24 inches, is strong brown sandy clay. The substratum to a depth of 60 inches is soft, white limestone bedrock.

Typically, Pedro soil has a surface layer that is dark gray fine sand about 5 inches thick. The subsurface layer, to a depth of 15 inches, is very pale brown fine sand. The subsoil, to a depth of 18 inches, is brownish yellow sandy clay loam. Below the subsoil, soft limestone bedrock extends to a depth of 35 inches and is underlain by limestone bedrock.

Rock outcrop in this map unit is exposed bedrock that ranges from 1 foot or less across to more than one-fourth of an acre.

Included with these soils in mapping are small areas of Kendrick, Micanopy, and Lochloosa soils. Also included are small areas of Williston and Pedro soils that have slopes less than 2 percent or more than 5 percent and small areas of soils that are similar to Williston soil but have limestone bedrock between depths of 40 and 60 inches.

The soils in this complex have a water table at a depth of more than 72 inches throughout the year. Permeability is rapid in the surface layer of Williston and Pedro soils. It is moderately slow in the subsoil of Williston soil and moderately rapid in the subsoil of Pedro soil. Rainfall is rapidly absorbed on protected area and retained by the soil. Runoff during rains is moderate on unprotected areas. The available water capacity of these soils is low to very low in the surface layer and moderate to high in the subsoil. Natural fertility is low. Erosion is a moderate hazard. The erosion hazard is greatest on the more sloping areas. In Williston soil, reaction ranges from strongly acid to neutral in the surface layer and from slightly acid to mildly alkaline in the subsoil. In Pedro soil, it ranges from strongly acid to slightly acid in the surface and subsurface layers and from slightly acid to mildly alkaline in the subsoil.

Typically, the Williston and Pedro soils are in the Upland Hardwood Hammock range site. This site is readily identified by the dense canopy of oaks, magnolias, and hickories. Cattle use the areas where the canopy is dense for shade and resting. Desirable forage on this site includes indiangrass, switchgrass, longleaf uniola, and chalky bluestem.

The soils in this complex are poorly suited to cultivated crops. Rock outcrop and depth to bedrock are severe limitations. Erosion is a hazard. These limitations are difficult to overcome. Row crops planted on the contour in alternate strips with close-growing cover crops help control erosion. A crop rotation system is needed that keeps the soil covered with close-growing cover crops at least half of the time. Crop residue left on the surface will help control erosion. Fertilizer and lime should be applied according to the need of the crop.

These soils are moderately suited to pasture. Coastal bermudagrass and improved bahiagrass do well if properly managed. Controlled grazing helps to maintain plant vigor for maximum yields and helps keep ground cover on the surface. Fertilizer and lime should be applied as needed.

Williston soil has a high potential for the production of pine trees, and Pedro soil has a moderately high potential. Undesirable plant competition is the main concern in management. Rock outcrop interferes with planting operations and limits the use of equipment.

Depth to bedrock is a severe limitation to use of Williston and Pedro soils as septic tank absorption fields. Williston soil has a moderately slow permeability. Depth to bedrock and seepage are severe limitations to use of the soils in this complex for sewage lagoons or sanitary landfills. Depth to bedrock also is a limitation for building site development. Enlarged and strengthened footings and foundations may also be needed for buildings.

Williston soil is in capability subclass IIe. The woodland ordination symbol for this soil is 11A. Pedro soil is in capability subclass IVs. The woodland ordination symbol for this soil is 10S. Rock outcrop is in capability subclass VIIIs but has not been assigned to a woodland group.

27—Pomello fine sand, 0 to 5 percent slopes. This soil is nearly level to gently sloping and moderately well drained. It is on low ridges and knolls on the flatwoods and also occurs in areas adjacent to some streams and water areas. The mapped areas are mainly oval to oblong and range from 5 to 20 acres.

Typically, the surface layer is dark gray and light brownish gray fine sand 5 inches thick. The subsurface layer, to a depth of 31 inches, is white fine sand. The upper part of the subsoil, to a depth of 52 inches, is black and dark brown fine sand. The lower part to a depth of 80 inches is brown fine sand.

Included with this soil in mapping are small areas of Basinger, EauGallie, Immokalee, Myakka, Orsino, and Paola soils. Also included are small areas of soils that have limestone cobbles and boulders at a depth of more than 60 inches. These buried rocks and boulders are mainly in areas adjacent to soils that are underlain by bedrock within 80 inches of the surface layer or adjacent to rock outcrop areas. The included soils make up less than 20 percent of the map unit.

The water table is at a depth of 2 to 3.5 feet for 1 month to 4 months and between depths of 3.5 and 5 feet for 8 months. Permeability is very rapid in the surface and subsurface layers. It is moderate in the upper part of the subsoil and moderately rapid in the lower part. The available water capacity is moderate in the subsoil and very low in the other layers. Reaction ranges from very strongly acid to medium acid. Natural fertility is very low. Plant response to fertilizer is poor. The soil rapidly becomes droughty as the water table is lowered.

Typically, this Pomello soil is in the Upland Hardwood Hammock range site. This site is readily identified by the dense canopy of oaks, magnolias, and hickories. Cattle use the areas where the canopy is dense for shade and resting. Desirable forage on this site includes indiangrass, switchgrass, longleaf uniola, and chalky bluestem.

This soil is not suited to cultivated crops. Low fertility, rapid leaching of fertilizer, and periodic droughtiness reduce the economic feasibility for such use.

This soil is moderately suited to improved pasture. Yields of adapted grasses, such as pangolagrass and bahiagrass, are only fair even if properly managed. Periodic applications of fertilizer and lime are needed. Controlled grazing is necessary if a good stand of grass is to be maintained. Periodic droughts greatly reduce yields.

This soil has a moderate potential for the production of pine trees. Seedling mortality, plant competition, and equipment use are the main concerns in management. Sand and slash pines are the most suitable trees to plant for commercial wood production.

Wetness and the poor filtering capacity of this sandy soil are severe limitations to use as septic tank absorption fields. If the soil is used for sanitary landfills or sewage lagoons, the facilities should be sealed to help prevent seepage and possible contamination of the ground water. Cutbanks may cave. Wetness is a moderate limitation to use of this soil for most building site development. Low fertility and periodic droughts are severe limitations for landscaping, lawn, and golf course development. Adapted species should be planted or an irrigation system should be installed to supply water during dry periods. Fertilizer and lime should be applied as needed.

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

28—Redlevel fine sand. This soil is nearly level and somewhat poorly drained. It is on the flatwoods in the western part of the county between the coastal marshes and the upland ridges. Depth to limestone bedrock typically ranges from 40 to 60 inches. Stones and boulders are scattered on the surface and throughout the subsoil in some horizons. The mapped areas vary in shape and range from 10 to 200 acres.

Typically, the surface layer is dark brown and dark grayish brown fine sand 7 inches thick. The subsoil to a depth of 55 inches is yellowish brown and strong brown fine sand underlain by limestone bedrock.

Included with this soil in mapping are small areas of Adamsville, Boca, Broward, Hallandale, and Pompano soils. Also included are areas of rock outcrop. The included soils make up less than 20 percent of the map unit.

The water is at a depth of 20 to 40 inches for 2 to 4 months. It may rise above 20 inches during very wet periods in some years. Permeability is rapid. The available water capacity is low. Reaction ranges from strongly acid to moderately alkaline. The soil becomes more acid during extended dry periods or when it is artificially drained. Natural fertility is low.

Typically, this Redlevel soil is in the Cabbage Palm Flatwoods range site. This site is readily identified by scattered pines and cabbage palms that have an understory of saw palmetto and grasses. This range site is similar to the South Florida Flatwoods range site, but it has a higher percentage of herbaceous plants and cabbage palms. If grazing is controlled, this range site has the potential to produce significant amounts of creeping bluestem, switchgrass, and various panicum species. If the range deteriorates as a result of poor grazing management, saw palmetto and pineland threeawn (wiregrass) will dominate the site.

This soil is moderately suited to cultivated crops. Scattered rock outcrop can pose problems in land preparation. Most crops grow well if water control practices are implemented to overcome the wetness limitation. During very dry periods in some years, irrigation is needed if the crop value warrants. A crop rotation system is needed that keeps the soil covered with soil-improving, close-growing cover crops at least three-fourths of the time. Soil-improving crops and crop residue left on the soil increase the content of organic matter in the soil. Fertilizer and lime should be applied according to the need of the crop.

This soil is mostly used for pasture and is well suited to improved pasture. Plants, such as Coastal bermudagrass and bahiagrass, grow well if lime and fertilizer are applied periodically. Controlled grazing helps to maintain plant vigor for maximum yields.

This soil has a moderately high potential for the production of pine trees. Wetness and rock outcrops cause problems for equipment operation in some areas. For maximum yields, corrective measures are needed to increase the rate of seedling survival and to reduce undesirable plant competition. Slash pine is the most suitable tree to plant for commercial wood production.

Wetness, depth to bedrock, and poor filtering capacity are severe limitations of this soil for most urban uses. For use as septic tank absorption fields, mounding may overcome the wetness problems. If sewage lagoons and sanitary landfills are installed, they should be sealed to control seepage and possible contamination of ground water. Wetness is the main limitation to use for most building site development. Cutbanks may cave. A water control system can help to improve soil conditions for many uses, including landscaping, lawns, and golf course development. Fertilizer and lime should be applied as needed.

This Redlevel soil is in capability subclass IIIw. The woodland ordination symbol for this soil is 7W.

29—Astatula fine sand, 0 to 5 percent slopes. This soil is nearly level to gently sloping and excessively drained. It is in a few level areas and on uneven side slopes and convex ridgetops on the uplands. The mapped areas are nearly oval and range from about 10 to more than 500 acres, and some areas on elevated landscapes on the flatwoods are irregular in shape and range from about 4 to 10 acres.

Typically, the surface layer is light brownish gray fine sand about 5 inches thick. The underlying material to a depth of 80 inches is yellow and reddish yellow fine sand.

Included with this soil in mapping are areas of Candler, Lake, Paola, and Tavares soils. Also included are small areas of Astatula soils that have slopes of more than 5 percent. The included soils make up about 20 percent of the map unit

The water table is more than 80 inches below the surface throughout the year. Permeability is very rapid. The available water capacity is very low. If the surface layer is protected by vegetation, rain is rapidly absorbed into the soil and runoff is slow. Reaction ranges from very strongly acid to slightly acid. Natural fertility is very low. Crop response to fertilizer is low to moderate, but nutrients from fertilizer are rapidly leached.

Typically, this Astatula soil is in the Longleaf Pine-Turkey Oak Hills range site. This site is on rolling land that is nearly level to strongly sloping. It is easily recognized by the landform and dominant vegetation of longleaf pine and turkey oak. The natural fertility of this site is low as a result of the rapid movement of plant nutrients and water through the soil. The forage production and quality are poor, and cattle do not readily use this range site if other sites are available. Desirable forage on this site includes creeping bluestem, lopsided indiangrass, and low panicum.

This soil is not suited to cultivated crops. The very low available water capacity, very low natural fertility, and rapid leaching of nutrients are severe limitations. These limitations are difficult to overcome.

This soil is fairly suited to improved pasture. Even the better adapted grasses, such as pangolagrass and bahiagrass, grow only fairly well on this soil. Established plantings must be carefully managed. If not properly grazed and fertilized, plant vigor and yields will rapidly decrease. Drought reduces yields and is very harmful to plants in a weakened condition.

This soil has a low potential for the production of pine trees. It has severe to moderate limitations to use of equipment. The seedling mortality rate is high. Sand pine is the most suitable tree to plant for commercial wood production.

Seepage and the poor filtering capacity of this soil are limitations to use as septic tank absorption fields and for sanitary landfills or sewage lagoons. The limitations to use of this soil as septic tank absorption fields are slight if these installations are not excessively concentrated in an area. If the soil is used for sanitary landfills or sewage lagoons, the facilities must be properly constructed and sealed. This soil has slight limitations to use for building site development. Cutbanks may cave. The soil has severe limitations if used for landscaping, lawns, and golf course development. Species adapted to very low fertility and droughty conditions should be planted. It is often necessary to install an irrigation system, and fertilizer should be applied as needed.

This Astatula soil is in capability subclass VIs. The woodland ordination symbol for this soil is 3S.

30—Astatula fine sand, 5 to 8 percent slopes. This soil is moderately sloping and excessively drained. It is on uneven side slopes on the upland ridges. The mapped areas are irregular in shape and range from 5 to about 100 acres.

Typically, the surface layer is gray fine sand 2 inches thick. The underlying material to a depth of 80 inches is brownish yellow and yellow fine sand.

Included with this soil in mapping are small areas of Candler, Lake, Paola, and Tavares soils. Also included are small areas of Astatula soils that have slopes of less than 5 percent and small areas of Astatula soils that have slopes of more than 8 percent. The included soils make up about 20 percent of the map unit.

The water table is more than 80 inches below the surface throughout the year. Permeability is very rapid. The available water capacity is very low. The soil rapidly becomes droughty during periods of low rainfall. If the surface is protected by a vegetative cover, rain is rapidly absorbed into the soil, and runoff is slow. Unprotected areas have an increased erosion hazard. Natural fertility is very low. Crop response to fertilizer is low to moderate, but nutrients from fertilizer are rapidly leached. Reaction ranges from very strongly acid to slightly acid.

Typically, this Astatula soil is in the Longleaf Pine-Turkey Oak Hills range site. This site is on rolling land that is nearly level to strongly sloping. It is easily recognized by the landform and dominant vegetation of longleaf pine and turkey oak. The natural fertility of this site is low as a result of the rapid movement of plant nutrients and water through the soil. The forage production and quality are poor, and cattle do not readily use this range site if other sites are available. Desirable forage on this site includes creeping bluestem, lopsided indiangrass, and low panicum.

This soil is not suited to cultivated crops. The very low available water capacity, very low natural fertility, and rapid leaching of nutrients are severe limitations. These limitations are difficult to overcome. Erosion is a severe hazard.

This soil is poorly suited to improved pasture. Even the better adapted grasses, such as pangolagrass and bahiagrass, grow only fairly well on this soil. A severe erosion hazard exists if vegetation is not maintained to protect the soil surface. If not properly grazed, yields and plant vigor will rapidly decrease. Erosion will increase if the soil surface is not protected. Fertilizer and lime are needed. Prolonged drought reduces yields and is especially severe if the plants are in a weakened condition from overgrazing.

This soil has a low potential for the production of pine trees. It has severe to moderate limitations to use of equipment. The rate of seedling mortality is high. Sand pine is the most suitable tree to plant for commercial wood production.

The poor filtering capacity of this soil and seepage are limitations to use as septic tank absorption fields and for sanitary landfills or sewage lagoons. The limitation for septic tank absorption fields is slight if the installations are not excessively concentrated in an area. If the soil is used for sanitary landfills or sewage lagoons, the facilities should be designed to overcome slope problems and should be sealed. This soil has slight limitations to use for building site development. Cutbanks may cave. The soil has severe limitations if used for landscaping, lawns, and golf course fairways. Species adapted to low fertility and droughty conditions should be planted. It is often necessary to install an irrigation system, and fertilizer should be applied as needed.

This Astatula soil is in capability subclass VIs. The woodland ordination symbol for this soil is 3S.

31—Sparr fine sand, 5 to 8 percent slopes. This soil is moderately sloping and somewhat poorly drained. It is on side slopes on the upland ridges. The mapped areas are irregular in shape and range from 5 to about 50 acres. The slopes are smooth to concave.

Typically, the surface layer is grayish brown fine sand about 8 inches thick. The subsurface layer, to a depth of 45 inches, is pale brown and light yellowish brown fine sand. The upper part of the subsoil, to a depth of 51 inches, is light yellowish brown fine sandy loam. The lower part to a depth of 80 inches is pale brown and light gray sandy clay loam.

Included with this soil in mapping are small areas of Arredondo, Kendrick, and Lochloosa soils. Also included are small areas of Sparr soils that have slopes of less than 5 percent and small areas of soils that are similar to Sparr soil but have hard and soft limestone boulders in the subsoil. These areas mainly are adjacent to soils that have limestone bedrock or boulders in their profiles. The included soils make up less than 25 percent of the map unit.

The water table is at a depth of 1.5 to 3.5 feet for periods of 1 month to 4 months. Permeability is rapid in the sandy surface and subsurface layers and slow in the subsoil. Runoff is medium.

Typically, this Sparr soil is in the Upland Hardwood Hammock range site. This site is readily identified by the dense canopy of oaks, magnolias, and hickories. Cattle use the areas where the canopy is dense for shade and resting. Desirable forage on this site includes indiangrass, switchgrass, longleaf uniola, and chalky bluestem.

This soil is fairly suited to cultivated crops. Limitations include wetness, droughtiness during dry periods, rapid leaching of nutrients, and slope. Row crops planted on the contour in alternate strips with close-growing cover crops help control erosion. A crop rotation system is needed that keeps the soil covered with close-growing, soil-improving crops at least three-fourths of the time. Soil-improving crops and crop residue left on the soil increase the content of organic matter in the soil. Fertilizer and lime should be applied according to the need of the crop. If slope permits, irrigating during dry periods will help to obtain the maximum yields.

This soil is moderately suited to improved pasture. Deep-rooted grasses, such as bermudagrass and bahiagrass, are well adapted to this soil. Fertilizer and lime should be applied as needed. Controlled grazing helps to maintain plant vigor for high yields and controls erosion by keeping a vegetative cover on the soil to protect the surface.

This soil has a moderately high potential for the production of pine trees. Moderate concerns in management are use of equipment, seedling mortality, and undesirable plant competition. Slash pine is the most suitable tree to plant for commercial wood production.

The high water table is a severe limitation to use of this soil as septic tank absorption fields and for sanitary landfills and sewage lagoons. Measures to reduce or overcome soil wetness is needed. If the soil is used for sanitary landfills or sewage lagoons, the facilities should be sealed to help prevent seepage. Wetness is a moderate limitation for building site development, for dwellings without basements, and for commercial buildings. This soil has severe limitations to use for structures with basements. Cutbanks may cave. This soil has moderate limitations if used for lawns, landscaping, and golf course development. Species adapted to low fertility and droughty conditions should be planted. An irrigation system is often needed, and fertilizer should be regularly applied.

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

32—Candler-Urban land complex, 0 to 8 percent slopes. This complex consists of nearly level to moderately sloping Candler soils and areas of Urban land. Candler soils are mainly on lawns, vacant lots, and playgrounds. The Urban land part of the map unit is areas covered by buildings, streets, and parking lots. The individual areas of Candler soil and Urban land in this map unit are too mixed or too small to map separately at the scale used for the maps in the back of the publication.

Candler soil makes up about 55 percent of the map unit. Urban land generally makes up about 35 percent. The included soils make up about 10 percent.

Typically, Candler soil has a surface layer that is gray fine sand about 3 inches thick. The subsurface layer, to a depth of 60 inches, is pale brown and light yellowish brown fine sand. Below the subsurface layer to a depth of about 80 inches is very pale brown fine sand that has scattered lamellae of dark yellowish brown sandy loam.

Included with these soils in mapping are small areas of Arredondo, Astatula, Lake, Paola, and Tavares soils. Also included are some areas of Urban land that makes up more than 50 percent of the map unit.

Candler soil has a water table at a depth of more than 80 inches throughout the year. Permeability is rapid. The available water capacity is low to very low. This soil is very droughty during periods of low rainfall. Natural fertility is very low. If sloping areas are not protected by vegetation, runoff and the hazard of erosion is increased.

Present use precludes use of the soils in this complex for uses other than urban. Soil interpretations can be made only for the Candler soil. The poor filtering capacity and seepage are limitations to use of this soil for sanitary facilities. Limitations are slight to use of the soil as septic tank absorption fields; but high density installations can contaminate ground water. Limitations are slight for most building site development, but cutbanks may cave. Limitations are severe for landscaping, lawns, and golf course development. Species adapted to very low fertility and droughty conditions should be planted or an irrigation system should be installed to supply water during dry periods. Fertilizer should be applied as needed.

The soils in this map unit have not been assigned to a capability subclass or to a woodland group.

33—Micanopy loamy fine sand, 2 to 5 percent slopes. This soil is gently sloping and somewhat poorly drained. It is on upland ridges. The mapped areas generally are irregular in shape and are less than 50 acres in size. The slopes are smooth to concave.

Typically, the surface layer is black and very dark gray loamy fine sand 8 inches thick. The subsurface layer, to a depth of 15 inches, is brown loamy fine sand. The upper part of the subsoil, to a depth of 25 inches, is yellowish brown sandy clay. The middle part, to a depth of 55 inches, is gray sandy clay. The lower part to a depth of 63 inches is mottled gray, yellowish brown, strong brown, and yellowish red sandy clay.

Included with this soil in mapping are small areas of Lochloosa soils. Also included are small areas of Micanopy soils that have slopes of less than 2 percent, small areas of Micanopy soils that have slopes of more than 5 percent, and small areas of soils that have more than 5 percent plinthite in the subsoil. The included soils make up less than 25 percent of the map unit.

A perched water table is between depths of 1.5 and 2.5 feet for 1 month to 3 months and is more than 60 inches below the surface during dry periods. Permeability is rapid in the surface and subsurface layers and slow in the subsoil. The available water capacity is low in the surface and subsurface layers and ranges from moderate to high in the subsoil. Natural fertility is low. Plant response to fertilizers is good.

Typically, this Micanopy soil is in the Upland Hardwood Hammock range site. This site is readily identified by the dense canopy of oaks, magnolias, and hickories. Cattle use the areas where the canopy is dense for shade and resting. Desirable forage on this site includes indiangrass, switchgrass, longleaf uniola, and chalky bluestem.

This soil is well suited to cultivated crops. Tile drains or open ditches are needed to improve soil drainage during wet periods. A crop rotation system is needed that keeps the soil covered with close-growing, soil-improving crops at least one-half the time. Crop residue and soil-improving crops left on the soil increase the content of organic matter in the soil. Proper seedbed preparation includes bedding in rows. Fertilizer and lime should be applied according to the need of the crop.

This soil is well suited to improved pasture. Bahiagrasses and white clover grow well if managed properly. Water control measures are needed to remove excess water after heavy rains. Regular applications of fertilizer and lime are needed. Controlled grazing helps to maintain plant vigor for maximum yields.

This soil has a high potential for the production of pine trees. The concerns in management are slight. Slash pine is the most suitable tree to plant for commercial wood production.

Wetness and slow permeability of this soil are severe limitations to use as septic tank absorption fields. Wetness and seepage are severe limitations to use for sewage lagoons or sanitary landfills. It may be difficult to dig the clayey subsoil. The high shrink-swell potential is a severe limitation to use for building site development and for local roads and streets. Special design and proper construction are necessary to overcome the shrink-swell potential of this soil. Wetness also is a severe limitation to use for buildings with basements, and it is a moderate limitation if the soil is used for lawns, landscaping, and golf course development.

This Micanopy soil is in capability subclass IIw. The woodland ordination symbol for this soil is 11A.

35—Sparr fine sand, 0 to 5 percent slopes. This soil is nearly level to gently sloping and somewhat poorly drained. It is in seasonally wet areas on the upland ridges, at the base of some sloping areas, and near some poorly drained areas. The mapped areas are nearly circular to very irregular in shape and range from 5 to about 100 acres. The slopes are smooth and slightly concave.

Typically, the surface layer is grayish brown fine sand 8 inches thick. The subsurface layer, to a depth of 50 inches, is brown, pale brown, and very pale brown fine sand. The upper part of the subsoil, to a depth of 59 inches, is light yellowish brown fine sandy loam. The middle part, to a depth of 70 inches, is light yellowish brown sandy clay loam. The lower part to a depth of 80 inches is light brownish gray sandy clay loam. Mottles of brown, red, yellow, and gray occur from a depth of about 20 to 80 inches.

Included with this soil in mapping are small areas of Arredondo, Kendrick, and Lochloosa soils. Also included are small areas of Sparr soils that have slopes of more than 5 percent and a few small areas of soils that are similar to Sparr soils but have limestone boulders in the subsoil. These areas are mainly adjacent to soils that contain bedrock or boulders in their profiles. The included soils make up less than 25 percent of the map unit.

The water table is at a depth of 2.5 to 3.5 feet for periods of 1 month to 4 months. Permeability is rapid in the sandy surface and subsurface layers and slow in the subsoil. Runoff is slow. The available water capacity is low to moderate. Natural fertility is low.

Typically, this Sparr soil is in the Upland Hardwood Hammock range site. This site is readily identified by the dense canopy of oaks, magnolias, and hickories. Cattle use the areas where the canopy is dense for shade and resting. Desirable forage on this site includes indiangrass, switchgrass, longleaf uniola, and chalky bluestem.

This soil is moderately suited to cultivated crops but wetness and periodic droughtiness are limitations. Surface ditches and mounded seedbeds can effectively lower the depth of the water table. Row crops planted on the contour in alternate strips with close-growing cover crops help control erosion. A crop rotation system is needed that keeps the soil covered with close-growing, soil-improving crops at least two-thirds of the time. Soil-improving crops and crop residue left on the soil increase the content of organic matter in the soil. Irrigation is generally needed during dry periods to obtain maximum yields. Fertilizer and lime should be applied according to the need of the crop.

This soil is well suited to improved pasture. Pangolagrass, bahiagrass, and white clover grow well if properly managed. Fertilizer and lime should be applied as needed. Controlled grazing helps to maintain plant vigor for maximum yields.

This soil has a moderately high potential for the production of pine trees. The use of equipment on the soil, seedling mortality, and undesirable plant competition are moderate concerns in management. Slash pine is the most suitable tree to plant for commercial wood production.

The natural wetness is a severe limitation to use of this soil as septic tank absorption fields and to use for sanitary landfills or sewage lagoons. Measures to reduce or overcome soil wetness are needed. If the soil is used for sanitary landfills or sewage lagoons, the facilities should be sealed to help prevent seepage. Wetness is a moderate limitation to use for building site development, dwelling without basements, and commercial buildings. Cutbanks may cave. This soil has moderate limitations if used for lawns, landscaping, and golf course development. Species adapted to low fertility and droughty conditions should be planted. An irrigation system should be installed to supply water during dry periods. Fertilizer should be applied as needed.

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

36—EauGallie fine sand. This soil is nearly level and poorly drained. It is on the flatwoods. The mapped areas are irregular in shape and range from 5 to 50 acres. The slopes are gradual and less than 2 percent.

Typically, the surface layer is very dark and dark gray fine sand 10 inches thick. The subsurface layer, to a depth of 22 inches, is light brownish gray fine sand. The subsoil extends to a depth of 80 inches. The upper part is dark brown fine sand. The middle part is dark reddish brown fine sand. The lower part is pale olive and light gray fine sandy loam.

Included with this soil in mapping are small areas of Basinger, Immokalee, and Myakka soils. Also included are small areas of soils that are similar to EauGallie soil but have scattered limestone boulders in the subsoil. The included soils make up less than 20 percent of the map unit.

The water table is within 10 inches of the surface for 1 month to 4 months. It recedes during dry periods but is generally within 40 inches of the surface layer for 6 months. Runoff is slow. The available water capacity is low to very low in the surface and subsurface layers and is moderate to high in the subsoil. Reaction is very strongly acid to medium acid in the surface layer. It is extremely acid to slightly acid in the upper part of the subsoil and very strongly acid to mildly alkaline in the lower part. Natural fertility is very low. Crop response to fertilizer is moderate.

Typically, this EauGallie soil is in the South Florida Flatwoods range site. This site can be identified by scattered pine trees that have an understory of saw palmetto and grasses. If grazing is controlled, the site has the potential to produce significant amounts of creeping bluestem, lopsided indiangrass, chalky bluestem, and various panicum species. If the range deteriorates as a result of poor grazing management, saw palmetto and pineland threeawn (wiregrass) will dominate the site.

This soil is poorly suited to cultivated crops because of wetness, very low fertility, and low or very low available water capacity. A water control system is needed to remove excess water during wet seasons. Row crops planted in alternate strips with close-growing cover crops help control erosion. A crop rotation system is needed that keeps the soil covered with close-growing, soil-improving crops at least three-fourths of the time. Soil-improving crops and crop residue left on the soil increase the content of organic matter. Fertilizer and lime should be applied according to the need of the crop. Irrigation is generally needed during dry periods to obtain maximum yields.

This soil is well suited to improved pasture. Pangolagrass, improved bahiagrasses, and white clover grow well if excess surface water is removed. Regular applications of fertilizer and lime are needed. Controlled grazing helps to maintain plant vigor for maximum yields, allows for plant recovery, and protects the soil by keeping a vegetative cover on the surface.

This soil has a moderately high potential for the production of pine trees. Moderate concerns in management are equipment use, seedling mortality, and undesirable plant competition. Slash pine is the most suitable tree to plant for commercial wood production.

This soil has severe limitations for most urban uses because of wetness. Measures to control wetness are needed if sanitary facilities are installed. If the soil is used for sanitary landfills or sewage lagoons, the facilities should be sealed to help prevent seepage and the contamination of ground water. Cutbanks may cave. Wetness is a severe limitation to use of this soil for most building site development. Wetness and drought are severe limitations to use of this soil for lawns, landscaping, and golf fairways. Plant species adapted to these conditions should be planted, if possible. The application of fertilizer and lime is often necessary.

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

37—Matlacha, limestone substratum-Urban land complex. This complex consists of nearly level, somewhat poorly drained Matlacha soil and areas of Urban land. Matlacha soil was formed by fill material from earth-moving operations. This map unit is in the western part of the county near the Gulf Coast. The Urban land part of this map unit is areas covered by houses, streets, parking lots, and other urban structures. The mapped areas are rectangular and range from about 5 to 50 acres. The individual areas of Matlacha soil and Urban land in this map unit are too mixed or too small to map separately at the scale used for the maps in the back of this publication.

Matlacha soil makes up about 50 percent of the map unit. Urban land makes up about 25 percent. The included soils make up about 25 percent.

Typically, Matlacha soil has a surface layer that is very dark grayish brown gravelly fine sand about 6 inches thick. The lower part, to a depth of about 23 inches, is mottled white, brown, and yellow fine sand mixed with 25 percent limestone fragments and scattered pockets of fine-textured clay material. Below the layers of fill material is the original buried soil. The upper part of the buried soil, to a depth of about 44 inches, is very dark grayish brown and light gray fine sand. The next layer, to a depth of 48 inches, is light brownish gray fine sandy loam. Below the fine sandy loam is a thin layer of soft limestone bedrock underlain by hard, white, fractured limestone bedrock.

Included with these soils in mapping are small areas of Basinger, EauGallie, Hallandale, Homosassa, Lauderhill, Lacoochee, Myakka, Okeelanta, Pompano, and Weekiwachee soils. These soils have not been covered by fill material.

Matlacha soil has a water table between depths of 2 and 3 feet for 1 month to 3 months annually.

Present use precludes the use of the soils in this complex for uses other than urban development. In most parts of the map unit, the high water table and depth to bedrock are moderate to severe limitations to use of these soils for most sanitary facilities and for building site development. These soils have slight to severe limitations for lawns, landscaping, and golf course development. Soils should be tested to determine the need for fertilizers and lime. In some areas, adding several inches of good topsoil may be necessary.

The soils in this map unit have not been assigned to a capability subclass or to a woodland group.

38—Rock outcrop-Homosassa-Lacoochee complex. This complex consists of limestone Rock outcrop and Homosassa and Lacoochee soils that are in tidal saltwater marshes and on some offshore islands along the Gulf Coast. The soils in this complex are flooded daily by high tides. The mapped areas are irregular in shape and range from 50 to 100 acres. The individual areas of Rock outcrop and soils in this map unit are too mixed or too small to map separately at the scale used for the maps in the back of this publication.

Rock outcrop makes up about 40 percent of the map unit but ranges from about 10 to 90 percent in individual delineations. Homosassa soil makes up about 35 percent. Lacoochee soil makes up about 15 percent. The included soils make up about 10 percent.

Rock outcrop in some areas of this map unit is exposed large, flat surfaces pitted with solution holes. In other areas, such as areas near Ozello, it is highly fractured and pitted and is partly dissolved along fractures.

Typically, Homosassa soil has a surface layer that is black mucky fine sandy loam about 8 inches thick. Below that, dark grayish brown fine sand extends to a depth of 21 inches and is underlain by hard limestone bedrock.

Typically, Lacoochee soil has a surface layer that is light gray fine sandy loam about 5 inches thick. The subsurface layer, to a depth of 8 inches, is grayish brown loamy fine sand. The subsoil, to a depth of 13 inches, is yellowish brown loamy fine sand. Below that, white soft limestone bedrock extends to a depth of 21 inches and is underlain by hard, white limestone bedrock.

Included with these soils in mapping are small areas of Weekiwachee soils. Also included are some areas of soils that are similar to Homosassa and Lacoochee soils but are less than 10 inches to bedrock.

The soils in this map unit are flooded daily by high tides. Some of the included soils on the elevated parts of this map unit are periodically flooded by exceptional high tides and storm tides. The available water capacity of Homosassa and Lacoochee soils is very high in the surface layer and moderate in the deeper layers. Soil reaction ranges from neutral to moderately alkaline in the surface layer and from slightly acid to moderately alkaline in the other layers.

Typically, the Homosassa and Lacoochee soils are in the Salt Marsh range site. This site can be identified by level, tidal marsh areas that have the potential to produce significant amounts of smooth cordgrass, marshhay cordgrass, seashore saltgrass, and many other forage grasses and forbs.

Tidal action causes saltwater saturation of the soil and inundates the soils to a few inches above the surface layer. In some areas, these soils are soft and will not support the weight of a large animal. In areas that are suitable for grazing, the potential to produce desirable forage is almost as high as it is on a freshwater marsh. Poorly-managed salt marshes are generally dominated by rushes and sawgrass.

The soils in this map unit are not suited to cultivated crops, pasture grasses, or woodland. Rock outcrop and the high content of salt and sulfur in the soils are severe limitations. These limitations are difficult to overcome. Flooding is a hazard.

The soils in this map unit have severe limitations for urban use. The flood hazard is a continuing problem. Rock outcrop hinders making excavations. Special sanitary systems, such as mounded septic tank absorption fields, are generally needed. Enlarged foundations are needed for buildings. The addition of topsoil is needed for lawns, landscaping, and golf course development.

The Rock outcrop in this map unit is in capability subclass VIIIs. Homosassa and Lacoochee soils are in capability subclass VIIIw. The soils in this map unit have not been assigned to a woodland group.

39—Hallandale-Rock outcrop complex, rarely flooded. This complex consists of a nearly level, poorly drained, mineral soil and Rock outcrop. Hallandale soil is along the coast adjacent to freshwater and saltwater marshes and also on some offshore islands. This soil is underlain by bedrock at a depth of 20 inches or less. The mapped areas are long and narrow and range from 5 to about 100 acres. The individual areas of Hallandale soil and Rock outcrop in this map unit are too mixed or too small to map separately at the scale used for the maps in the back of this publication.

Hallandale soil makes up about 55 percent of the map unit. Rock outcrop makes up about 25 percent. The included soils make up about 20 percent.

Typically, Hallandale soil has a surface layer that is black fine sand about 2 inches thick. The subsurface layer, to a depth of 6 inches, is grayish brown fine sand. The subsoil, to a depth of 10 inches, is yellowish brown fine sand. Below the subsoil is hard limestone bedrock.

Rock outcrop in the map unit is randomly scattered, and individual exposures are mostly less than 2 square feet. In some areas, Rock outcrop occurs as narrow bands less than 1 foot wide and up to 50 feet or more in length. In a few cultivated areas, machinery has broken off some of the exposed bedrock, and the surface layer is cobbly fine sand.

Included with these soils in mapping are Basinger, Citronelle, Lauderhill, and Redlevel soils.

In most years, the soils in this map unit have a high water table within 10 inches of the surface for up to 6 months. In some areas, the surface may be covered by shallow water for up to a month after very heavy rains. In drained areas, the water level fluctuates as the water level in the drainage ditches and solution holes in the limestone bedrock fluctuates. These soils are rarely flooded by severe coastal storms. Local flood-hazard studies can be consulted to determine the extent of flooding. Permeability is moderate to moderately slow. Runoff is slow. Natural fertility is low, and response to applied fertilizers is moderate. Soil reaction ranges from strongly acid to slightly acid in the surface layer and from medium acid to moderately alkaline in the lower layers.

Typically, the Hallandale soil is in the Cabbage Palm Hammock range site. This site is readily identified by thick stands of cabbage palms and a few scattered oak. The hammocks also occur in slightly elevated areas in the Slough and South Florida Flatwoods communities. Cattle use the areas where the canopy is dense for shade and resting. Desirable forage on this site includes chalky bluestem, creeping bluestem, hairy panicum, low panicum, and South Florida bluestem.

The soils in this map unit are not suited to most cultivated crops. The many unfavorable features of the soil reduce economic feasibility. Rock outcrop interferes with the use of equipment.

These soils are moderately suited to improved pasture in areas where Rock outcrop does not pose too great a problem in land preparation. Pangolagrass, improved bahiagrasses, and clover grow well with proper management. A water control system that includes shallow ditches should be installed to remove excessive surface water. Regular applications of fertilizers and lime are needed. Controlled grazing prevents overgrazing and helps to maintain plant vigor for maximum yields.

In areas where Rock outcrop is not extensive, these soils have a moderate potential for the production of pine trees. The limitations to use of equipment are moderate. Seedling mortality is moderate. Slash pine is a suitable tree to plant (fig. 5) for commercial wood production.

The soils in this map unit have severe limitations for urban use. Depth to bedrock and wetness are the main

Figure 5.—Slash pine is a suitable tree for planting on Hallandale-Rock outcrop complex, rarely flooded.

limitations. Flooding is a hazard. If the flooding hazard can not be eliminated, consideration should be given to the elevation of buildings and roads. If permitted, elevated and mounded septic tank absorption fields can be used to provide functional, nonpolluting sanitary systems. Depth to bedrock severely limits excavations; therefore, these soils are poorly suited to use for sanitary landfills and sewage lagoons. If sanitary landfills and sewage lagoons are installed, these facilities should be sealed to prevent contamination of the ground water. Landscaping and other plantings generally require the reworking of available soil material and the adding of fill materials to provide an increased rooting depth.

Hallandale soil is in capability subclass IVw. The woodland ordination symbol for this soil is 8W. Rock outcrop is in capability subclass VIIIs but has not been assigned to a woodland group.

40—Homosassa mucky fine sandy loam. This soil is nearly level and very poorly drained. It is in coastal tidal marshes. Elevations are mainly less than 3 feet above sea level. The landscape is dissected by narrow to broad flood channels, and common on the landscape are large, nearly circular solution hole ponds. The mapped areas generally are irregular in shape and range from 50 to 500 acres. The slopes are less than 1 percent.

Typically, the surface layer is very dark gray mucky fine sandy loam about 10 inches thick. The next layer, to a depth of 18 inches, is very dark grayish brown loamy fine sand. The upper part of underlying layer, to a depth of 31 inches, is grayish brown loamy fine sand. The lower part to a depth of 35 inches is soft limestone bedrock underlain by hard limestone bedrock.

Included with this soil in mapping are areas of soils that have a fine sandy loam or mucky sandy clay loam surface texture. Also included are areas of soils that have bedrock at a depth of 40 inches or more. The included soils make up about 20 percent of the map unit.

This soil is flooded daily by tides. The available water capacity is very high in the surface layer and is medium in the other layers. Reaction is neutral or mildly alkaline in the surface layer and slightly acid to mildly alkaline in the other layers.

Typically, this Homosassa soil is in the Salt Marsh range site. This site can be identified by level, tidal marsh areas that have the potential to produce significant amounts of smooth cordgrass, marshhay cordgrass, seashore saltgrass, and many other forage grasses and forbs.

Tidal action causes saltwater saturation of the soil and inundates the soil to a few inches above the surface layer. In some areas, the soil is soft and will not support the weight of a large animal. In areas that are suitable for grazing, the potential to produce desirable forage is almost as high as it is on a freshwater marsh. Poorly managed salt marshes are generally dominated by rushes and sawgrass.

This soil is not suited to cultivated crops, pasture, or woodland because of the daily hazard of flooding and the high content of salt and sulfur.

This soil has severe limitations for urban use. The flood hazard is difficult to overcome, and depth to bedrock hampers excavations. Excess salt and sulfur are severe limitations to use of this soil for lawns, landscaping, or golf courses even if flooding is controlled.

This Homosassa soil is in capability subclass VIIIw but has not been assigned to a woodland group.

41—Candler fine sand, 8 to 12 percent slopes. This soil is strongly sloping and excessively drained. It is on rolling side slopes on the upland ridges. The mapped areas are irregular in shape and range from 5 to 20 acres.

Typically, the surface layer is very dark gray fine sand 4 inches thick. The subsurface layer, to a depth of 67 inches, is brown and brownish yellow fine sand. The next layer to a depth of 80 inches is light yellowish brown fine sand that has bands of strong brown loamy sand lamellae randomly distributed throughout.

Included with this soil in mapping are small areas of Apopka, Arredondo, Astatula, and Lake soils. Also included are small areas of Candler soils that have slopes of less than 8 percent. The included soils make up about 25 percent of the map unit.

The water table is more than 80 inches below the surface throughout the year. Permeability is rapid. The available water capacity is very low. If the surface layer is protected by a vegetative cover, rain is rapidly absorbed into the soil. Runoff from unprotected areas during heavy rains is rapid. On such areas, erosion is a severe hazard. Reaction ranges from very strongly acid to slightly acid. Natural fertility is very low. Nutrients from fertilizer are rapidly leached.

Typically, this Candler soil is in the Longleaf Pine-Turkey Oak Hills range site. This site is on rolling land that is nearly level to strongly sloping. It is easily recognized by the landform and dominant vegetation of longleaf pine and turkey oak. The natural fertility of this site is low as a result of the rapid movement of plant nutrients and water through the soil. The forage production and quality are poor, and cattle do not readily use this range site if other sites are available. Desirable forage on this site includes creeping bluestem, lopsided indiangrass, and low panicum.

This soil is not suited to cultivated crops or improved pasture. The very low available water capacity, very low fertility, and rapid leaching of nutrients are severe limitations. These limitations are difficult to overcome. Erosion is a severe hazard.

This soil has a moderate potential for the production of pine trees. The primary concerns in management include equipment use, seedling mortality, and undesirable plant competition. If seedlings are planted, disturbance of vegetative cover should be kept to a minimum to control or reduce the hazard of erosion. Sand pine is the most suitable tree to plant for commercial wood production.

The poor filtering capacity of this soil and seepage are limitations to use for sanitary facilities. Slope is a moderate limitation to use of this soil as septic tank absorption fields; but a high density of septic tank absorption fields can contaminate ground water. Slope is a severe limitation to use for sewage lagoons or sanitary landfills. If the soil is used for sanitary landfills or sewage lagoons, the facilities should be sealed to help prevent seepage. Special design and proper installation can help overcome the slope limitation. Slope is also a moderate limitation to use of this soil for most building site development. This soil has severe limitations if used for landscaping, lawns, and golf fairways. Species adapted to low fertility and droughty conditions should be planted. An irrigation system to supply water during dry periods is often necessary. Fertilizer should be applied as needed.

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

46—EauGallie fine sand, depressional. This soil is nearly level and very poorly drained. It is in depressions and is adjacent to drainageways on the flatwoods. This soil is also along the outer edges of some swamps and marshes. Depressions are small and nearly circular. Delineations at the edges of swamps and marshes are narrow and elongated. The mapped areas range from 5 to about 50 acres. The slopes are smooth to concave and less than 2 percent.

Typically, the surface layer is black fine sand about 3 inches thick. The subsurface layer, to a depth of 26 inches, is light brownish gray and gray fine sand. The upper part of the subsoil, to a depth of 46 inches, is dark brown, pale brown, and grayish brown fine sand. The middle part, to a depth of 54 inches, is grayish brown fine sandy loam. The lower part to a depth of 80 inches is gray sandy clay.

Included with this soil in mapping are small areas of Basinger, Immokalee, Myakka, and Pompano soils. Also included are small areas of soils that are similar to EauGallie soil but have scattered boulders and cobbles in the subsoil and soils that have up to 10 inches of litter and organic matter on the surface. The included soils make up about 20 percent of the map unit.

In most years, this soil is ponded for 3 to 9 months. In slightly elevated positions around the margins of the ponded areas, the water table is within 10 inches of the surface, and these areas are ponded during periods of heavy rains. During dry periods, the water table recedes to a depth of 10 inches or more. Permeability is rapid in the surface and subsurface layers and is moderate in the subsoil. The available water capacity is low or very low in the surface and subsurface layers and is moderate in the subsoil. Natural fertility is low.

Typically, this EauGallie soil is in the Freshwater Marshes and Ponds range site. This site can be identified by an open expanse of grasses, sedges, rushes, and other herbaceous plants or by a wooded area dominated by bay, cypress, sweetgum, and water oak. These areas are generally saturated or covered by surface water for 2 or more months during the year. If grazing is controlled, this range site has the potential to produce more forage than any of the other range sites in the county. For maximum production, wooded areas need to be cleared. Chalky bluestem and blue maidencane dominate the dry parts of the site. Maidencane is the dominant plant in the wet parts. Other desirable forage on this site includes cutgrass, bluejoint panicum, sloughgrass, and low panicums. Periodic high water levels provide natural deferment from cattle grazing if grazing is not properly controlled. Carpetgrass, an introduced plant, tends to dominate the dry parts of the site if it is excessively grazed.

This soil is not suited to cultivated crops, improved pasture, or commercial pine tree production. Ponding and wetness and low natural fertility are problems that need to be overcome.

This soil is severely limited for urban use. Ponding and wetness are limitations that are difficult to overcome. The poor filtering capacity of the sand is a pollution hazard if this soil is used for sanitary facilities. If used for sanitary landfills or sewage lagoons, the facilities should be sealed to prevent contamination of the ground water.

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

47—Fort Meade loamy fine sand, 0 to 5 percent slopes. This soil is nearly level to gently sloping and well drained. It is on the upland ridges. This soil is surrounded by soils on higher elevations and receives runoff from them. The mapped areas are irregular in shape or nearly circular and range from 5 to about 100 acres. Vegetation on this soil is more dense than on adjacent soils.

Typically, the surface layer is black loamy fine sand 13 inches thick. The underlying material to a depth of 80 inches is very dark yellowish brown, dark brown, and strong brown loamy fine sand.

Included with this soil in mapping are small areas of Arredondo, Candler, and Lake soils. Also included are soils that are similar to Fort Meade soil but have a dark surface layer less than 10 inches thick.

The water table is more than 6 feet below the surface throughout the year. Permeability is rapid. The available water capacity ranges from low to medium in the surface layer and is low in the underlying layers. Runoff is slow to medium. Natural fertility is low. Crop response to fertilizer is moderate, but nutrients from fertilizer are rapidly leached. The soil is droughty during dry periods. Reaction ranges from strongly acid to neutral in the surface layer and from very strongly acid to medium acid in the underlying layers.

Typically, this Fort Meade soil is in the Upland Hardwood Hammock range site. This site is readily identified by the dense canopy of oaks, magnolias, and hickories. Cattle use the area where the canopy is dense for shade and resting. Desirable forage on this site includes indiangrass, switchgrass, longleaf uniola, and chalky bluestem.

This soil is poorly suited to cultivated crops. Droughtiness and rapid leaching of plant nutrients are limitations. Row crops planted on the contour in alternate strips with close-growing cover crops help control erosion. A crop rotation system is needed that keeps the soil covered with close-growing, soil-improving crops at least two-thirds of the time. Soil-improving crops and crop residue left on the surface increase the content of organic matter in the the soil. Irrigation is generally needed during dry periods to obtain maximum yields.

This soil is well suited to improved pasture. Deep-rooted plants, such as Coastal bermudagrass and bahiagrass normally grow well when they are properly grazed and fertilized. If not properly grazed and fertilized, plant vigor and yields will rapidly decrease. Drought reduces yields and is very harmful to plants in a weakened condition.

This soil has a moderately high potential for the production of pine trees; however, plant competition is a moderate limitation. Slash pine is the most suitable tree to plant for commercial wood production.

This soil has slight limitations to use as septic tank absorption fields if they are properly installed and are not excessively concentrated in an area. The filtering capacity of this soil is poor and seepage can occur. If this soil is used for a sanitary landfill or sewage lagoon, the facilities must be properly constructed and sealed against seepage. The limitations are slight for building site development and for roads and streets, but cutbanks may cave. This soil has moderate limitations for landscaping, lawns, and golf fairways. Species adapted to low fertility and droughty conditions should be planted. An irrigation system is needed to supply water during the dry periods. Fertilizer should be applied as needed.

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

48—Arents, 45 to 65 percent slopes. This soil consists of soil material and limestone dug from canals. This soil is piled along the side of the canals or used to form embankments for highway overpasses. Most of this map unit is along the excavations that were dug as part of the Cross Florida Barge Canal. The mapped areas mostly are long and narrow and range from 5 to 50 acres.

The soil in this map unit is made up of sandy mineral material mixed with varying amounts of loamy and finer textured material from the former subsoil and substratum and with limestone fragments ranging from sand-size to large boulders. In some locations, parts of former organic soil horizons are also intermixed. This soil does not have an orderly sequence of soil layers but is a highly variable mixture of lenses, streaks, and pockets of soil material and limestone fragments. The thickness of the Arents ranges from about 2 feet to 30 feet or more.

The water table is more than 6 feet below the surface throughout the year. Permeability is variable, but it is rapid in most areas. Rain runs off rapidly with minimal absorption except where the surface is protected by vegetation. The hazard of wind and water erosion is severe. Runoff generally contains considerable suspended material which is deposited on the adjacent land and in the water areas. The available water capacity varies but is mostly low to very low. Reaction ranges from slightly acid to moderately alkaline.

Included with this soil in mapping are other areas of Arents that have slopes ranging from 12 to 45 percent. Also included are small areas of natural soils and Arents that have slopes of 5 percent or less. The included soils make up less than 10 percent of the map unit.

Most areas of this soil are not in vegetation. In some areas, highway embankments have been vegetated.

Possible agricultural and urban usage is precluded by present use or is impractical because of slope and inaccessibility to these areas. The soil in this map unit could serve as a source of fill material.

Arents has not been assigned to a capability subclass or to a woodland group.

49—Terra Ceia-Okeelanta association, frequently flooded. This association consists of nearly level, very poorly drained, organic soils. These soils are along the edges of freshwater rivers and lakes. Terra Ceia soil is adjacent to open water and are bounded on the inland side by Okeelanta soil. Okeelanta soil is adjacent to the upland areas. The mapped areas are mainly long and narrow and range from 20 to 50 acres.

Terra Ceia soil makes up about 65 percent of the map unit. Okeelanta soil makes up about 20 percent. The included soils make up about 15 percent.

Typically, Terra Ceia soil has a surface layer of black muck about 10 inches thick. Below that layer, black and dark reddish brown muck extends to a depth of 80 inches or more.

Typically, Okeelanta soil has a surface layer of black muck about 10 inches thick. Below that layer, dark brown muck extends to a depth of about 27 inches. The underlying material to a depth of 65 inches is light gray fine sand.

Included with these soils in mapping are small areas of Basinger and Lauderhill soils. Also included are small areas of rock outcrop.

During low tide, the soils in this association are covered by shallow water from the adjacent freshwater rivers. The floodwaters are not saline as they come from the freshwater streams and rivers. Flood waters are generally 2 to 3 feet above the surface at high tide. The flooding recedes as the tide recedes and allows discharge of the river. Flooding fluctuates daily.

The native vegetation of this map unit is dominated by cypress, sweetbay, blackgum, large gallberry, summersweet clethra, titi, and scattered pine.

Flooding precluded agricultural or urban use of these soils. This map unit serves as a feeding area for several varieties of fish and aquatic birds.

The soils in this map unit are in capability subgroup VIIIw. The woodland ordination symbol for these soils is 6W.

50—Kanapaha fine sand, 0 to 5 percent slopes. This soil is a nearly level to gently sloping and poorly drained. It is in low positions on the upland ridges. The mapped areas are mainly oblong and range from 5 to 100 acres.

Typically, the surface layer is very dark gray fine sand 6 inches thick. The subsurface layer, to a depth of 45 inches, is light brownish gray and light gray fine sand. The subsoil to a depth of 80 inches is light brownish gray fine sandy loam.

Included with this soil in mapping are small areas of Adamsville, Arredondo, Basinger, and Sparr soils. The included soils make up less than 20 percent of the map unit.

The water table is at a depth of less than 10 inches for 1 month to 3 months each year and is at a depth of 10 to 30 inches for about 4 months in most years. The available water capacity is very low in the sandy surface layer and is moderate in the subsoil. Reaction ranges from very strongly acid to medium acid. Natural fertility is low. Plant response to fertilizer is moderate.

This soil is poorly suited to most cultivated crops. However, a well designed water control program and soil-improving measures make it suitable for a number of vegetable crops. A water control system is needed to remove excess water in wet seasons and provide water through subsurface irrigation in dry seasons. For some crops, bedding in rows is sometimes necessary to lower the depth of the water table. Crop residue and soil-improving crops left in the soil increase organic matter content. Fertilizer and lime should be applied according to the need of the crop.

Typically, this Kanapaha soil is in the Upland Hardwood Hammock range site. This site is readily identified by the dense canopy of oaks, magnolias, and hickories. Cattle use the areas where the canopy is dense for shade and resting. Desirable forage on this site includes indiangrass, switchgrass, longleaf uniola, and chalky bluestem.

This soil is well suited to improved pasture. Pangolagrass, improved bahiagrasses, and white clover grow well if properly managed. Water control measures are needed to remove excess surface water after heavy rains. Regular applications of fertilizer and lime are needed. Controlled grazing prevents overgrazing and helps to maintain plant vigor for maximum yields.

This soil has a moderately high potential for the production of pine trees. The primary concerns in management include equipment use and undesirable plant competition. Slash pine is a suitable tree to plant for commercial wood production.

This soil has severe limitations to use as septic tank absorption fields even if proper water control measures are used and areas are mounded. The limitations for dwellings and commercial buildings are severe because of wetness and seepage. Wetness and droughtiness during periods of low rainfall are severe limitations to use of this soil for landscaping, lawns, and golf course development. For these uses, proper drainage, an irrigation system to supply water during dry periods, and applications of fertilizer and lime are needed to improve the soil.

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

51—Boca-Pineda, limestone substratum complex. This complex consist of nearly level, poorly drained soils that are underlain by limestone bedrock. These soils are adjacent to freshwater swamp areas that parallel the coast. The mapped areas range from 1 acre to 5 acres. The slopes range from 0 to 2 percent. The individual areas of the soils in this map unit are too mixed or too small to conform to the scale used for the maps in the back of this publication.

Boca soil makes up about 55 percent of the map unit. Pineda soil makes up about 30 percent. The included soils make up about 15 percent.

Typically, Boca soil has a surface layer that is very dark brown fine sand 3 inches thick. The upper part of the subsurface layer, to a depth of 8 inches, is very pale brown fine sand. The lower part, to a depth of 22 inches, is yellow fine sand. The subsoil, to a depth of 32 inches, is light olive gray sandy clay loam. Below the subsoil is hard limestone bedrock.

Typically, Pineda soil has a surface layer that is dark grayish brown fine sand 2 inches thick. The subsurface layer, to a depth of 5 inches, is grayish brown fine sand. The upper part of the subsoil, to a depth of 25 inches, is brownish yellow and strong brown fine sand. The lower part, to a depth of 42 inches, is light brownish gray sandy clay loam. Below the subsoil is hard limestone bedrock.

The soils in this complex have a high water table at a depth of less than 10 inches for 1 month to 6 months in most years. The water table recedes into the underlying limestone during the drier periods. During very wet periods, some small areas are ponded.

Included with these soils in mapping are soils that have limestone bedrock at a depth of less than 24 inches. Small areas of rock outcrops are common in these shallow soils.

Permeability is rapid in the sandy layers and slow to moderate in the finer textured layers. The available water capacity is low to very low in the sandy layer and moderate in the finer textured layers. Boca soil ranges from strongly acid to moderately alkaline. Pineda soil ranges from very strongly acid to neutral in the sandy layers and from strongly acid to moderately alkaline in the finer textured layers. Natural fertility is low. Solution pits and fractures occur in the limestone bedrock throughout the map unit.

Typically, the Boca and Pineda soils are in the South Florida Flatwoods range site. This site can be identified by scattered pine trees that have an understory of saw palmetto and grasses. If grazing is controlled, this range site has the potential to produce significant amounts of creeping bluestem, lopsided indiangrass, chalky bluestem, and various panicum grasses. If the range deteriorates as a result of poor grazing management, saw palmetto and pineland threeawn (wiregrass) will dominate the site.

The soils in this map unit are poorly suited to cultivated crops because of wetness and the depth to bedrock. Soils in areas that have bedrock at a uniform depth can be used for some crops if a water control system is installed to remove excess water during the wet periods. If adequate outlets for artificial drainage are not available, this can be a problem. Row crops planted in alternate strip with close-growing cover crops help control erosion. A crop rotation system is needed that keeps the soil covered with close-growing, soil-improving crops two-thirds of the time. Crop residue and soil-improving crops that remain on the surface increase the content organic matter in the soil. Bedding in rows will increase the rooting depth. Fertilizer and lime should be applied according to the need of the crop.

The soils in this map unit are well suited to improved pasture. With proper management, pangolagrass, improved bahiagrasses, and white clovers grow well. Water control systems are needed to remove excess surface water after heavy rains. Regular applications of fertilizer and lime are needed. Controlled grazing helps to maintain plant vigor for maximum yields.

The soils in this map unit have a moderately high to high potential for the production of pine trees. The major concerns in management are use of equipment, seedling mortality, and plant competition. Water control systems are needed to remove excess surface water during wet periods. Rock outcrops can be a problem in land preparation. Slash pine is the preferred tree to plant.

The soils in this map unit have severe limitations for urban use. Depth to bedrock and wetness are the main limitations. Installation of an effective water control system should be considered, but obtaining adequate outlets can be a problem. If permitted, elevated and mounded septic tank absorption fields can be used to provide functional, nonpolluting septic tank absorption field systems. Wetness and depth to bedrock severely limit the use of these soils for sewage lagoons and sanitary landfills. If sewage lagoons and sanitary landfills are installed, these facilities should be sealed to prevent seepage. Soil wetness severely limits the use of these soils for most building site development. For landscaping and other plantings, adapted species should be used or a water control system installed and plant nutrients applied regularly. An irrigation system may be needed to provide water during dry periods.

The soils in this map unit are in capability subclass IVw. The woodland ordination symbol for these soils is 8W.

52—Anclote fine sand, depressional. This soil is nearly level and very poorly drained. It is in oval depressions and in other poorly defined drainageways. The mapped areas are irregular in shape or nearly oval and range from 5 to 20 acres. The slopes are concave and less than 2 percent.

Typically, the surface layer is black and very dark gray fine sand 14 inches thick. The underlying material to a depth of 80 inches is grayish brown, light brownish gray, and gray fine sand.

Included with this soil in mapping are some small, nondepressional areas of Anclote fine sand and small areas of Basinger, Myakka, and Pompano soils. Also included are a few small areas of soils along the Withlacoochee River where randomly distributed limestone boulders are at a depth of 60 inches or more and some areas of soils adjacent to mined areas that have a thin clayey surface layer. The included soils make up about 15 percent of the map unit.

This soil is ponded for 9 to 12 months in most years. During dry periods, the water table may recede but it is generally within 10 inches of the surface. The high water table and ponding restrict the rooting depth of all plants except water-tolerant plants. Internal drainage is impeded by ponding or because of the shallow water table. When the soil is not saturated, permeability is rapid throughout. Reaction ranges from strongly acid to moderately alkaline. Natural fertility is high.

Typically, this Anclote soil is in the Freshwater Marshes and Ponds range site. This site can be identified by an open expanse of grasses, sedges, rushes, and other herbaceous plants or by a wooded area dominated by bay, cypress, sweetgum, and water oak. These areas are generally saturated or covered by surface water for 2 or more months during the year. If grazing is controlled, this range site has the potential to produce more forage than any of the other range sites in the county. For maximum production, wooded areas need to be cleared. Chalky bluestem and blue maidencane dominate the dry parts of the site. Maidencane is the dominant plant in the wet parts. Other desirable forage on this site includes cutgrass, bluejoint panicum, sloughgrass, and low panicums. Periodic high water levels provide natural deferment from cattle grazing if grazing is not properly controlled. Carpetgrass, an introduced plant, tends to dominate the dry parts of the site if it is excessively grazed.

This soil is not suited to agricultural or urban uses because of ponding. Drainage is not feasible in most areas because of the relatively small areas of this soil and its low, generally isolated, position on the landscape.

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

53—Boca fine sand. This soil is nearly level and poorly drained. It is on low, broad flats and in poorly defined drainageways on the flatwoods. The mapped areas range from broad to narrow and are somewhat elongated. These areas range from 4 to 100 acres. The slopes are less than 2 percent.

Typically, the surface layer is dark grayish brown fine sand 5 inches thick. The subsurface layer, to a depth of 19 inches, is light gray fine sand. The next layer, to a depth of 21 inches, is yellow fine sand. The subsoil to a depth of 38 inches is grayish brown sandy clay loam underlain by limestone bedrock.

Included with this soil in mapping are small areas of Basinger, EauGallie, Hallandale, Redlevel, and Myakka soils. Also included are some areas of soils near the Cross Florida Barge Canal that have been drained. The included soils make up about 25 percent of the map unit.

The water table is within 10 inches of the surface for 2 to 4 months in most years. It recedes into the limestone during dry periods. Permeability is rapid in the sandy layers and moderate in the finer textured layers. The available water capacity is low to very low in the surface and subsurface layers. It is moderate in the subsoil. Reaction ranges from strongly acid to moderately alkaline. Natural fertility is low.

This soil is poorly suited to cultivated crops because of wetness and depth to bedrock. In many areas, rock outcrop interferes with land preparation. Some areas can be made suitable for some crops if a water control system is installed to remove excess water during the wet seasons. Row crops planted in alternate strip with close-growing, soil-improving crops help control erosion. A crop rotation system is needed that keeps the soil covered with close-growing, soil-improving crops at least two-thirds of the time. Crop residue and soil-improving crops left on the soil increase the content of organic material in the soil. Bedding in rows can increase the rooting depth. Fertilizer and lime should be applied according to the need of the crop.

Typically, this Boca soil is in the Cabbage Palm Flatwoods range site. This site is readily identified by scattered pines and cabbage palms that have an understory of saw palmetto and grasses. This range site is similar to the South Florida Flatwoods range site, but it has a higher percentage of herbaceous plants and cabbage palms. If grazing is controlled, this range site has the potential to produce significant amounts of creeping bluestem, lopsided indiangrass, chalky bluestem, switchgrass, and various panicum species. If the range deteriorates as a result of poor grazing management, saw palmetto and pineland threeawn (wiregrass) will dominate the site.

This soil is well suited to improved pasture (fig. 6). Pangolagrass, improved bahiagrasses, and white clover grow well if properly managed. Water control measures are needed to remove excess surface water after heavy rains. Regular applications of fertilizer and lime are needed. Controlled grazing helps to maintain plant vigor for maximum yields.

This soil has a high potential for the production of pine trees. Moderate concerns in management are equipment use and seedling mortality. Slash pine is the most suitable tree to plant for commercial wood production.

Wetness and depth to bedrock are severe limitations to use of this soil for urban development. If permitted, structures, such as elevated and mounded septic tank absorption fields, are needed to provide functional, nonpolluting sanitary facilities. Excavations are difficult because of the bedrock, and wetness is a severe limitation to use of this soil for sanitary landfills or sewage lagoons. If the soil is used for sanitary landfill or sewage lagoons, the facilities should be sealed to help prevent seepage and the contamination of ground water. Landscaping and other plantings require the use of adapted species or a water control system should be installed. An irrigation system may be needed to supply water during dry periods.

This Boca soil is in capability subclass IIIw. The woodland ordination symbol for this soil is 8W.

54—Apopka fine sand, 0 to 5 percent slopes. This soil is nearly level to gently sloping and well drained. It is on upland ridges. The mapped areas are irregular in shape and range from 20 to about 200 acres.

Typically, the surface layer is very dark grayish brown fine sand 7 inches thick. The subsurface layer, to a depth of 50 inches, is yellowish brown and light yellowish brown fine sand. The upper part of the subsoil, to a depth of 67 inches, is strong brown sandy clay loam. The lower part to a depth of 80 inches is red sandy clay loam.

Included with this soil in mapping are small areas of Arredondo, Astatula, Candler, and Sparr soils. Also included are small areas of Apopka soils that have slopes of up to 8 percent. The included soils make up less than 20 percent of the map unit.

The water table is more than 6 feet below the surface in most years. The subsoil is moderately permeable. Rain is rapidly absorbed, and runoff is slow. Erosion is a slight hazard. Natural fertility is low. Plant response to fertilizer is moderate.

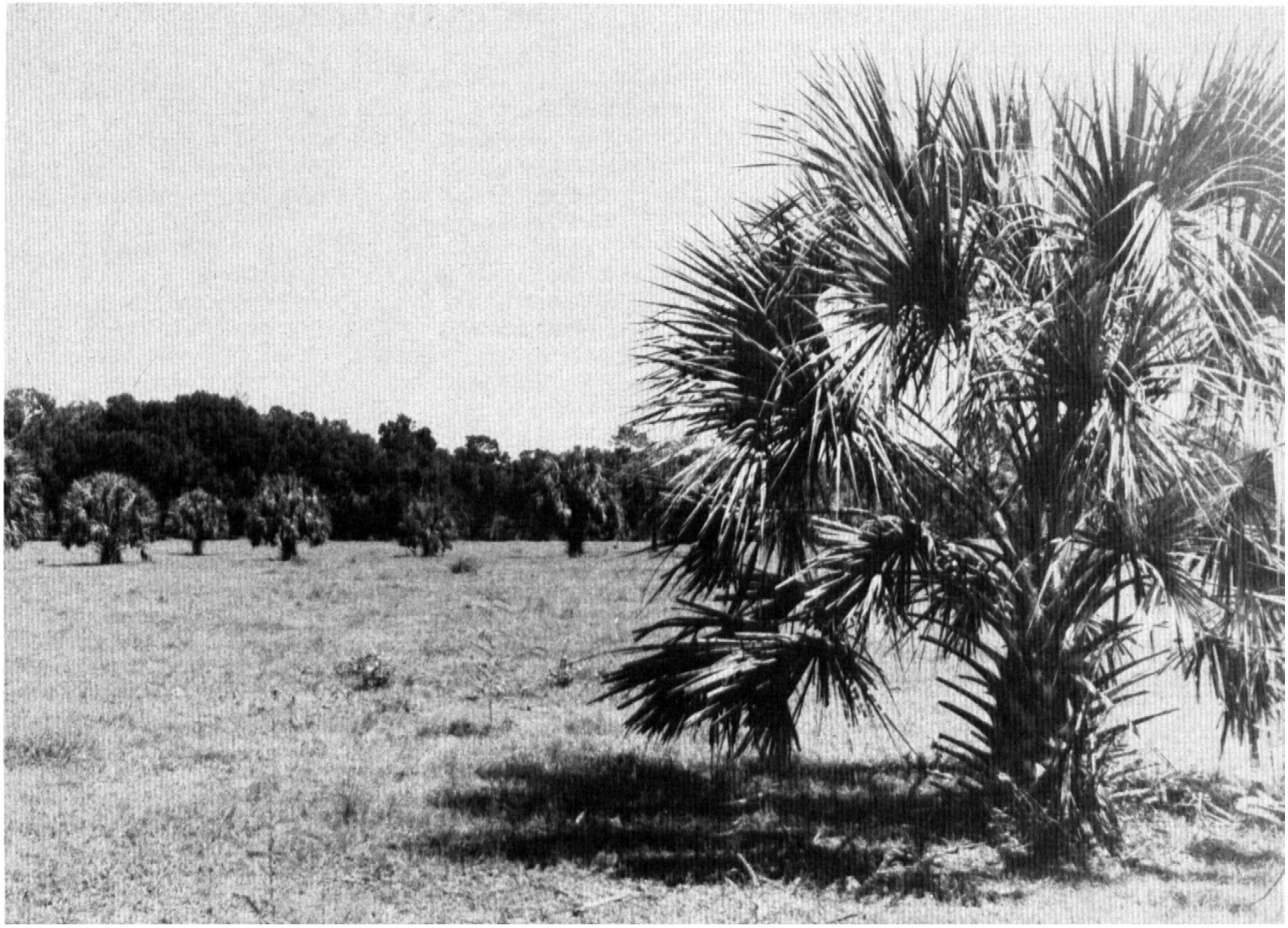


Figure 6.—Boca fine sand is well suited to improved pasture.

This soil is poorly suited to cultivated crops because it is droughty during periods of low rainfall, and plant nutrients are rapidly leached. If cultivated, special soil-improving methods should be used. Row crops planted on the contour in alternate strips with close-growing cover crops help control erosion. A cropping system is needed that keeps the soil covered with close-growing, soil-improving crops at least two-thirds of the time. Soil-improving crops and crop residue left on the soil increase the content of organic matter in the soil. Fertilizer and lime should be applied according to the need of the crop. If feasible, irrigation should be provided during droughty periods.

Typically, this Apopka soil is in the Longleaf Pine-Turkey Oak Hills range site. This site is on rolling land that is nearly level to strongly sloping. It is easily recognized by the landform and dominant vegetation of longleaf pine and turkey oak. The natural fertility of this site is low as a result of the rapid movement of plant nutrients and water through the soil. The forage production and quality are poor, and cattle do not readily use this range site if other sites are available. Desirable forage on this site includes creeping bluestem, lopsided indiangrass, and low panicum.

This soil is well suited to pasture and hay crops. Deep-rooted plants, such as Coastal bermudagrasses and bahiagrasses, normally grow well if well fertilized and limed. Controlled grazing helps to maintain plant vigor for maximum yields.

This soil has a moderately high potential for the production of pine trees. Moderate concerns in management are equipment use and seedling mortality.

Slash pine is the most suitable tree to plant for commercial wood production.

This soil has slight limitations to use as septic tank absorption fields. However, the sandy nature of the soil allows for seepage of sewage lagoons and sanitary landfills that are not lined or sealed. This soil has slight limitations to use for dwellings and commercial buildings; however, cutbank may cave. The droughtiness and low fertility severely limit the use of this soil for landscaping, lawns, and golf course development. For these uses, irrigation is generally needed to supply water during the dry periods. Fertilizer and lime should be applied frequently.

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

55—Udorthents, 0 to 5 percent slopes. This map unit consists of nearly level to gently sloping manmade soils. These soils are mainly in the central part of the county and generally are adjacent to pits. Most of these soils are in areas that have been mined and in a few areas where the mines are still active. In some areas, pits have been partly filled with the Udorthents. The individual areas of these soils range from 5 to 100 acres. The slopes are dominantly 5 percent or less. In a few areas, these soils have a somewhat undulating surface consisting of a series of short, moderately steep slopes that range from 12 to 20 percent.

These soils are a highly variable mixture of sandy and loamy overburden material (removed to obtain the phosphate or limestone deposits), geologic material from mining operations, and colloidal clay material. Each area and parts of each area of these soils differ. They reflect the differences in individual mined deposits and differences in mining methods used. Three very generalized kinds of pedons make up the Udorthents. One kind consists chiefly of loamy material to a depth of 80 inches or more. A second kind consists of thick to thin layers of sands alternating with finer textured material, mainly colloidal clays. The third kind consists of a sandy to loamy matrix that contains few to common bands, strips, and pockets of clayey material mixed throughout. All of these generalized pedons are in most areas and are intermixed. In most areas, few to common broken fragments of limestone, chert, and low-grade phosphate rock are throughout the soils. Boulders of these materials are in a few areas. In most areas, the surface is sandy; but in a few areas, it is a thin to thick layer of clayey material. The sand grains mainly are well coated with colloidal clay material, but areas of uncoated sand are common. Soil color is variable and ranges from white and gray to shades of yellow, brown, and red. In vegetated areas, a dark layer has formed on the surface. Reaction ranges from strongly acid to neutral. The thickness of the Udorthents is commonly 80 inches or more but ranges from 20 to more than 80 inches. In a few areas, hard or soft bedrock is at a depth of 60 to 80 inches.

Soil drainage is variable and ranges from excessively drained to well drained in sandy areas and is poorly drained in areas that have a high content of clay. A perched water table is on the clayey layers. Permeability ranges from rapid in the sandy areas to slow in areas of high clay content. The available water capacity ranges from very low to medium.

Included with these soils in mapping are small areas of Arredondo, Astatula, Candler, Ft. Meade, Kendrick, Lake, Sparr, and Tavares soils. Also included are slime ponds (areas upon which colloidal suspensions of clayey material were pumped) and areas of Candler soils and Udorthents which have had a thin layer of clayey material spread on the surface to improve the agricultural properties of the soils. In addition, areas used as sanitary landfills are included in this map unit. These areas contain up to 50 percent or more soil waste material and are named "sanitary landfill" on the maps in the back of this publication.

Udorthents, if abandoned, have been vegetated by a succession of plant species adapted to the soil properties of a particular area. Species adapted to soils that are better drained have become established in the better drained areas. More poorly drained areas have species adapted to wetter conditions. In most areas, the dense vegetation provides an excellent habitat for many wildlife species.

The differences between each area and within each area of Udorthents does not permit establishment of interpretations for various uses of the soils. Onsite investigations are needed to establish feasibility for any intended use.

Udorthents have not been assigned to a capability subclass or to a woodland group.

56—Lake, clayey surface, 0 to 5 percent slopes. This soil is nearly level to gently sloping and excessively drained. It is on upland ridges, mainly, around areas which were mined for phosphate. This soil has a surface layer of clayey fill material ranging from 2 to 20 inches thick. This spreading of clayey fill material occurred as a result of mining operations (overwash of slime ponds), or the fill material was added to improve the soil. The mapped areas range from 5 to 30 acres.

Typically, the surface layer is mottled yellow, brownish gray, light gray, and white clay that has scattered pockets of very dark gray fine sand 11 inches thick. The next layer, to a depth of 13 inches, is very dark gray fine sand. The underlying material to a depth of 80 inches is light brownish yellow and pale brown fine sand.

Included with this soil in mapping are small areas of Adamsville, Candler, Okeelanta, and Tavares soils that have a clay fill material up to 20 inches thick covering the surface layer. Also included are areas of soils that have clay fill material about 30 inches thick covering the surface layer. The included soils make up less than 25 percent of the map unit.

The water table is more than 72 inches below the surface throughout the year. Permeability is slow in the clayey material and is rapid or very rapid in the sandy layers. The available water capacity is high in the clayey material and low in the sandy layers. Reaction ranges from very strongly acid to mildly alkaline in the clayey material and is very strongly acid or strongly acid in the sandy layers. Natural fertility is low.

In most areas, the vegetation on this soil mainly is live oak, water oak, slash pine, and longleaf pine that have an understory of sedges, briars, and native grasses.

Droughtiness and low fertility severely limit the use of this soil for production of cultivated crops. Intensive management must be used for the production of adapted crops. Yields are limited by periodic droughts. Row crops planted on the contour in alternate strips with close-growing crops help control erosion. A crop rotation system is needed that keeps the soil covered with soil-improving, close-growing cover crops at least three-fourths of the time. Soil-improving crops and crop residue left on the soil increase or maintain the content of organic matter content and the available water capacity of the soil. Irrigation, if available, should be considered if crop value warrants.

This Lake soil is moderately suited to improved pasture if deep-rooted plants, such as Coastal bermudagrass and bahiagrasses, are grown. Regular applications of fertilizer and lime are needed. Controlled grazing helps to maintain plant vigor for maximum yields.

This soil has a moderate potential for the production of pine trees. Moderate concerns in management are equipment use and seedling mortality. Slash pine is the most suitable tree to plant for commercial wood production.

This soil has slight limitations to use as septic tank absorption fields; however, care must be taken to assure that tile lines are placed below the clayey surface layer. In addition, a dense concentration of sanitary facilities can contaminate ground water because of the poor filtering capacity of the substratum. Seepage is a severe limitation to use of this soil for sanitary landfills or sewage lagoons. This soil has slight limitations for building site development; however, cutbanks may cave.

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

57—Ona fine sand. This soil is nearly level and poorly drained. It is in broad flatwood areas. The mapped areas are irregular in shape and range from 3 to about 100 acres. The slopes are smooth and less than 2 percent.

Typically, the surface layer is very dark gray fine sand 8 inches thick. The subsoil, to a depth of 20 inches, is dark brown fine sand. The substratum to a depth of 80 inches is light yellowish brown, very pale brown, and brown fine sand.

Included with this soil in mapping are areas of Adamsville, Basinger, EauGallie, Immokalee, and Myakka soils. Also included are small areas of soils, adjacent to U.S. Highway 19, that are similar to Ona soil but have boulders in the profile and some areas of soils near the Cross Florida Barge Canal that have been drained. In these soils, the water table is deeper than is typical, and the duration of the high water table is less than that described as typical. The included soils make up about 25 percent of the map unit.

The water table is at a depth of less than 10 inches for periods of 1 month to 2 months, and it is at a depth of 10 to 40 inches for periods of 4 to 6 months. During very dry years, the water table may recede to a depth of more than 40 inches. Permeability is moderate in the subsoil and is rapid in the other layers. The available water capacity is moderate in the subsurface layer and subsoil and is very low in the substratum. Reaction ranges from extremely acid to medium acid. Natural fertility is low. Plant response to fertilizer is good.

Typically, this Ona soil is in the South Florida Flatwoods range site. This site can be identified by the scattered pine trees that have an understory of saw palmetto and grasses. If grazing is controlled, this range site has the potential to produce significant amounts of creeping bluestem, lopsided indiangrass, chalky bluestem, and various panicum species. If the range deteriorates as a result of poor grazing management, saw palmetto and pineland threeawn (wiregrass) will dominate the site.

This soil is suited to many cultivated crops if water control systems are properly installed and maintained. This generally involves the installation of ditches or a subsurface drainage system to remove excess surface water during wet periods and to provide water through irrigation in dry periods. Row crops planted in alternate strips with close-growing cover crops help control erosion. A cropping system is needed that keeps the soil covered with close-growing, soil-improving crops at least two-thirds of the time. Crop residue left on the surface helps to control erosion. For some crops, bedding in rows is sometimes necessary to lower the depth of the water table. Fertilizer and lime should be applied according to the need of the crop.

This soil is well suited to improved pasture. Pangolagrass, improved bahiagrass, and clover grow well if properly managed. Water control measures, such as surface and subsurface drainage, are needed to remove excess surface water after heavy rains and to help obtain maximum yields. Regular applications of fertilizer and lime are needed. Controlled grazing prevents overgrazing and helps to maintain plant vigor for maximum yields.

This soil has a moderately high potential for the production of pine trees. The main concerns in management are the limitations of this soil to use of equipment during wet periods, seedling mortality, and undesirable competition plant. Slash pine is the most suitable tree to plant for commercial wood production, but for best results a water control system to remove excess surface water should be installed.

Wetness, seepage, and the poor filtering capacity of this soil are severe limitations to use for sanitary facilities and most other urban uses. This soil also has severe limitations to use for sewage lagoons and sanitary landfills. If the soil is used for sewage lagoons and sanitary landfills, the facilities must be sealed to prevent the possible contamination of ground water. Wetness severely limits the use of this soil for building site development. Cutbanks may cave. Wetness and low fertility limit the use of this soil for lawns, landscaping, and golf course development. Plants adapted to these conditions should be planted or a water control system should be installed. Plant nutrients should be regularly applied. The installation of an irrigation system should be considered to supply water during dry periods.

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

58—Myakka, limestone substratum-EauGallie, limestone substratum complex. This complex consists of nearly level, poorly drained Myakka and EauGallie soils. These soils are on the coastal flatwoods and are also on some islands adjacent to saltwater marshes in the northern part of Citrus County. Depth to the limestone bedrock commonly is 50 to 80 inches but averages about 60 inches. The mapped areas range from broad to narrow and are somewhat elongated. These areas range from 4 to 100 acres. The slopes are less than 2 percent. The individual areas of the soils in this map unit are too mixed or too small to map separately at the scale used for the maps in the back of this publication.

Myakka soil makes up about 40 percent of the map unit. EauGallie soil makes up about 25 percent. The included soils make up about 35 percent.

Typically, Myakka soil has a surface layer that is dark gray fine sand about 5 inches thick. The subsurface layer, to a depth of 23 inches, is light brownish gray fine sand. The upper part of the subsoil, to a depth of 34 inches, is very dark gray fine sand. The lower part, to a depth of about 62 inches, is brown and light brownish gray fine sand. Below the subsoil is hard limestone bedrock.

Typically, EauGallie soil has a surface layer that is black fine sand about 4 inches thick. The subsurface layer, to a depth of 25 inches, is light brownish gray fine sand. The upper part of the subsoil, to a depth of 39 inches, is black fine sand. The middle part, to a depth of 59 inches, is grayish brown fine sand. The lower part, to a depth of 63 inches, is light olive gray sandy clay loam. Below the subsoil is hard limestone bedrock.

Included with these soils in mapping are Immokalee soils. Also included are some small depressional areas of Myakka, EauGallie, and Immokalee soils; small areas of Basinger and Hallandale soils; and some areas of rock outcrop. The included soils make up about 35 percent of this map unit.

The soils in this complex have a high water table at a depth of less than 10 inches for 1 month to 4 months in most years. It gradually recedes to a depth of 40 inches or more during drier periods. Internal drainage is moderately slow. The available water capacity is medium in the subsoil and low to very low in the surface and subsurface layers. The reaction of Myakka soil ranges from strongly acid to mildly alkaline. The reaction of EauGallie soil ranges from very strongly acid to medium acid in the surface and subsurface layers and from very strongly acid to slightly acid in the subsoil. Natural fertility of Myakka and EauGallie soils is low, and plant response to applied fertilizer is moderate.

Typically, the Myakka and EauGallie soils are in the Cabbage Palm Flatwoods range site. This site is in native vegetation of scattered pines and cabbage palms that have an understory of saw palmetto and grasses. This range site is similar to the South Florida Flatwoods range site, but it has a higher percentage of herbaceous plants and cabbage palms. If grazing is controlled, this range site has the potential to produce significant amounts of creeping bluestem, lopsided indiangrass, chalky bluestem, switchgrass, and various panicum species. If range deteriorates as a result of poor grazing management, saw palmetto and pineland threeawn (wiregrass) will dominate the site.

In areas that are relatively free of rock outcrop, the soils are suited to many cultivated crops if water control systems are properly installed and maintained. This generally involves the installation of ditches or a subsurface drainage system to remove excess water during wet periods and to provide water through irrigation during dry periods. A crop rotation system is needed that keeps the soil covered with close-growing, soil-improving crops three-fourths of the time. Crop residue left on the surface helps to control erosion. For some crops, bedding in rows is sometimes necessary to lower the depth of water table. Fertilizer and lime should be applied according to the need of the crop.

In most areas, the soils in this map unit are well suited to improved pasture. Pangolagrass, improved bahiagrass, and white clover grow well when properly managed. Water control measures, such as the installation of surface or subsurface drains, are needed to remove excess surface water after heavy rains. Regular applications of fertilizer and lime are needed. Controlling grazing prevents overgrazing and helps to maintain plant vigor for maximum yields.

These soils have a moderate to moderately high potential for the production of pine trees. The main concerns in management are the limitations for equipment use during wet periods, seedling mortality, and undesirable plant competition. Slash pine is the most suitable tree to plant for commercial wood production. For maximum production, a system to remove excess surface water should be installed.

Wetness is a severe limitation to use of these soils as septic tank absorption fields. Myakka, limestone substratum, soil has poor filtering capacity; therefore, effluent from septic tank absorption fields can contaminate ground water. Sewage lagoons and sanitary landfills should be sealed to prevent seepage. Bedrock at a depth of about 5 feet severely limits the use of these soils for sanitary landfills. These soils also have severe limitations for shallow excavations because of wetness and the possible caving of cutbanks. Wetness is a severe limitation for most building site development. Wetness and low fertility limit the use of these soils for lawns, landscaping, and golf course development. The conditions are less limiting if species adapted to wetness and low fertility are planted or if a water control system is installed and plant nutrients are applied regularly. An irrigation system is needed to provide water during dry periods.

The soils in this map unit are in capability subclass IVw. The woodland ordination symbol for Myakka soil is 6W. The woodland ordination symbol for EauGallie soil is 10W.

59—Boca fine sand, depressional. This soil is nearly level and poorly drained. It is in depressions and other poorly defined drainageways along the coast. This soil is underlain by limestone bedrock at a depth of 24 to 40 inches; however, solution pits extending to a depth of 60 inches or more are common. The mapped areas are mainly narrow and long or nearly round and are less than 30 acres in size. The slopes are less than 2 percent.

Typically, the surface layer is black fine sand 8 inches thick. The subsurface layer, to a depth of 21 inches, is light gray fine sand. The subsoil, to a depth of 25 inches, is grayish brown sandy clay loam. The next layer to a depth of 27 inches is a mixture of white limestone fragments, marl, and yellowish brown sandy clay loam underlain by limestone bedrock.

Included with this soil in mapping are small areas of Hallandale soils. Also included are soils that have layers of marl, limestone fragments, and finer textured material up to 20 inches thick on the surface of the bedrock and some small areas of rock outcrop. The included soils make up less than 20 percent of the map unit.

This soil is ponded for periods of 2 to 6 months in most years. The water table recedes below the surface during dry periods. It is generally within 10 inches of the surface. In very dry periods, the water table recedes into the limestone. Permeability is rapid in the sandy layers and is moderate in the finer textured layers. The available water capacity is low to moderate. Reaction ranges from strongly acid to mildly alkaline in the surface layer and is moderately alkaline in the other layers. The content of organic matter and natural fertility are low.

Typically, this Boca soil is in the Freshwater Marshes and Ponds range site. This site can be identified by an open expanse of grasses, sedges, rushes, and other herbaceous plants or by a wooded areas dominated by bay, cypress, sweetgum, and water oak. These areas are generally saturated or covered by surface water for 2 or more months during the year. If grazing is controlled, this range site has the potential to produce more forage than any of the other range sites in the county. For maximum production, wooded areas need to be cleared. Chalky bluestem and blue maidencane dominate the dry parts of the site. Maidencane is the dominant plant in the wet parts. Other desirable forage on this site includes cutgrass, bluejoint panicum, sloughgrass, and low panicums. Periodic high water levels provide natural deferment from cattle grazing if grazing is not properly controlled. Carpetgrass, an introduced plant, tends to dominate the drier parts of the site if it is excessively grazed.

This soil is not suited to cultivated crops and pasture because of ponding and depth to bedrock. Since most areas of this soil are so small, the installation of an artificial drainage system is not feasible unless it can be incorporated into a larger system. Commercial pine tree production is restricted to trees such as pond pine. If a good vegetative cover is maintained, this soil is well suited to use as habitat for wetland and shallow water wildlife.

Ponding and depth to bedrock are severe limitations to use of this soil for urban development. For most uses, an artificial drainage system is needed. Fill material should be added if permitted.

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

60—Broward fine sand. This soil is nearly level and somewhat poorly drained. It is on broad flatwoods near the coast. This soil is underlain by limestone between depths of 20 and 40 inches. In some areas, scattered boulders and rocks are at or near the surface, and some previously cultivated areas have cobbles scattered across the surface. Rock outcrop occurs in a few areas. The mapped areas are broad and rounded or irregular in shape and range from 10 to 150 acres.

Typically, the surface layer is very dark gray fine sand 5 inches thick. The upper part of the underlying material, to a depth of 15 inches, is gray fine sand. The lower part to a depth of 35 inches is brownish yellow fine sand underlain by limestone bedrock.

Included with this soil in mapping are small areas of Boca and Redlevel soils. Also included are some areas of soils near the Cross Florida Barge Canal that have been drained. The included soils make up about 20 percent of the map unit.

The water table is at a depth of 20 to 30 inches for periods of 2 to 6 months. In very wet years, it may rise above 20 inches for brief periods. Permeability is rapid throughout. The available water capacity is low to very low. Natural fertility is low. Plant response to fertilizer is low to moderate. Rain is rapidly absorbed, and runoff is slow. Reaction ranges from medium acid to moderately alkaline.

Typically, this Broward soil is in the Cabbage Palm Hammock range site. This site is readily identified by thick stands of cabbage palms and a few scattered oak. The hammocks also occur in slightly elevated areas in the Slough and South Florida Flatwoods communities. Cattle use the areas where the canopy is dense for shade and resting. Desirable forage on this site includes chalky bluestem, creeping bluestem, hairy panicum, low panicum, and South Florida bluestem.

This soil is poorly suited to cultivated crops because of wetness, depth to bedrock, and the rapid leaching of plant nutrients. Water control practices are needed to obtain maximum yields. A crop rotation system is needed that keeps the soil covered with soil-improving, close-growing cover crops at least three-fourths of the time. Soil-improving crops and crop residue left on the soil or plowed under help maintain the content of organic matter and control erosion. Irrigation is generally needed during dry periods for maximum yields and if crop value warrants. Fertilizer and lime should be applied according to the need of the crop.

This soil is moderately suited to pasture. Plants, such as Coastal bermudagrass and bahiagrass, are adapted to this soil. Regular applications of fertilizer and periodic applications of lime are needed. Controlled grazing helps to maintain plant vigor for maximum yields.

This soil has a moderately high potential for the production of pine trees. The main concerns in management are the limitations of this soil to use of equipment during wet periods, seedling mortality, and undesirable plant competition. Slash pine is the most suitable tree to plant for commercial wood production.

Wetness, the depth to bedrock, and the poor filtering capacity of this sandy soil are severe limitations to use as septic tank absorption fields. Seepage, wetness, and depth to bedrock are severe limitations to use of this soil for sewage lagoons and sanitary landfills. If the soil is used for sewage lagoons or sanitary landfills, the facilities should be sealed to help control seepage and the contamination of ground water. Wetness is a moderate limitation to use for buildings without basements and for local roads and streets. Cutbanks may cave. Periodic droughtiness is a moderate limitation to use of this soil for lawns, landscaping, and golf course development. Adapted species should be planted or an irrigation system should be installed to supply water during the dry periods. Fertilizer and lime should be applied as needed.

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

61—Orsino fine sand, 0 to 5 percent slopes. This soil is nearly level and moderately well drained. It is on knolls and ridges throughout the eastern part of the county. Most areas of this soil are surrounded by soils in lower areas that are more poorly drained. The mapped areas vary from long and narrow or somewhat circular and range from about 5 to 100 acres. The slopes are 5 percent or less.

Typically, the surface layer is dark grayish brown fine sand about 5 inches thick. The subsurface layer, to a depth of 14 inches, is white fine sand. The subsoil, to a depth of 48 inches, is brownish yellow and very pale brown fine sand. The substratum to a depth of 80 inches is white fine sand.

Included with this soil in mapping are small areas of Basinger, Paola, Pomello, and Tavares soils. The included soils make up about 20 percent of the map unit.

The water table is between depths of 40 and 72 inches for 6 months. Permeability is rapid. The available water capacity is very low. Reaction ranges from extremely acid to medium acid. Natural fertility is low. Plant response to fertilizer is low.

Typically, this Orsino soil is in the Upland Hardwood Hammock range site. This site is readily identified by the dense canopy of oaks, magnolias, and hickories. Cattle use the areas where the canopy is dense for shade and resting. Desirable forage on this site includes indiangrass, switchgrass, longleaf uniola, and chalky bluestem.

This soil is poorly suited to most cultivated crops because of droughtiness and rapid leaching of plant nutrients. Few crops are adapted to these conditions, and potential yields are low. Soil management should include row crops planted on the contour in alternate strips with close-growing cover crops to help control erosion. A crop rotation is needed that keeps the soil covered with close-growing, soil-improving crops at least three-fourths of the time. Soil-improving crops and crop residue left on the soil increase or maintain the content of organic matter in the soil. Fertilizer and lime should be applied according to the need of the crop. Irrigation is needed for maximum yields if crop value warrants.

This soil is moderately suited to improved pasture. Deep-rooted plants, such as Coastal bermudagrass and bahiagrass, are well adapted to this soil but yields are low as a result of droughts. Regular applications of fertilizer are needed. Controlled grazing helps to maintain plant vigor for maximum yields.

This soil has a moderate potential for the production of pine trees. Seedling mortality is a severe concern in management, and undesirable plant competition and equipment use are moderate concerns. Slash pine is the most suitable tree to plant for commercial wood production.

Wetness is a moderate limitation to use of this soil as septic tank absorption fields. If the soil is used for sanitary landfills or sewage lagoons, the facilities should be sealed to help prevent seepage and contamination of ground water. Limitations of this soil for building site development range from slight to severe. Cutbanks may cave. Droughtiness and low fertility are severe limitations if the soil is used for landscaping. Species adapted to these conditions should be planted. An irrigation system is needed to supply water during dry periods. Fertilizer should be applied as needed.

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

62—Malabar sand. This soil is nearly level and poorly drained. It is adjacent to depressional areas on the flatwoods. The mapped areas are mainly oblong and range from 5 to 40 acres. The slopes range from 0 to 2 percent.

Typically, the surface layer is very dark gray fine sand about 2 inches thick. The subsurface layer, to a depth of about 15 inches, is brown fine sand. The upper part of the subsoil, to a depth of 44 inches, is brownish yellow and light yellowish brown fine sand. The lower part to a depth of 80 inches is gray and light gray sandy clay loam.

Included with this soil in mapping are small areas of Basinger, Paisley, and Pineda soils. Also included are areas of soils that are similar to Malabar soil except that they are ponded for 1 week to 3 months in most years. The included soils make up about 15 percent of the map unit.

The water table is at a depth of less than 10 inches for 2 to 6 months during most years. It is at a depth of 10 to 30 inches during dry periods. The available water capacity is very low in the sandy layers and is moderate to high in the subsoil. Reaction ranges from medium acid to moderately alkaline. Natural fertility is low. Plant response to fertilizer is moderate.

This soil is poorly suited to cultivated crops because of wetness and low fertility. If water control systems are installed and soil-improving measures initiated, these soils can be used for many vegetable crops. A water control system is needed to remove excess water in wet seasons and provide water through subsurface irrigation in dry seasons. For some crops, bedding in rows is sometimes necessary to lower the depth of the water table. Crop residue and soil-improving crops left on the soil or plowed under help maintain the content of organic matter in the soil. Fertilizer and lime should be applied according to the need of the crop.

Typically, this Malabar soil is in the Cabbage Palm Flatwoods range site. This site is readily identified by scattered pines and cabbage palms that have an understory of palmetto and grasses. This range site is similar to the South Florida Flatwoods range site, but it has a higher percentage of herbaceous plants and cabbage palms. If grazing is controlled, this range site has the potential to produce significant amounts of creeping bluestem, lopsided indiangrass, chalky bluestem, switchgrass, and various panicum species. If the range deteriorates as a result of poor grazing management, saw palmetto and pineland threeawn (wiregrass) will dominate the site.

This soil is well suited to pasture. Pangolagrass, improved bahiagrasses, and white clover grow well if managed properly. Water control measures are needed to remove excess surface water after heavy rains. Regular applications of fertilizers and lime are needed. Controlled grazing prevents overgrazing and helps to maintain plant vigor for maximum yields.

This soil has a moderately high potential for the production of pine trees. Equipment use is a moderate concern in management, seedling mortality is a severe concern. Slash pine is a recommended tree to plant for commercial wood production.

This soil has severe limitations to use as septic tank absorption fields, even if proper water control measures are used and areas are mounded. Seepage and wetness are severe limitations to use of this soil for most building site development, landscaping, and golf course development. For these uses, proper drainage, an irrigation system to supply water during the dry periods, and applications of fertilizer and lime are needed to help improve the soil.

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

63—Paisley fine sand. This soil is nearly level and poorly drained. It is adjacent to depressional areas throughout the county and along the Withlacoochee River. The mapped areas generally are oblong and range from 5 to 70 acres.

Typically, the surface layer is very dark gray fine sand about 5 inches thick. The subsurface layer, to a depth of 15 inches, is light brownish gray fine sand. The subsoil to a depth of 80 inches is dark gray, gray, and light gray sandy clay loam and sandy clay.

Included with this soil in mapping are small areas of Boca, EauGallie, Immokalee, and Malabar soils. The included soils make up less than 20 percent of the map unit.

The water table is at a depth of less than 10 inches for 2 to 6 months during most years. It is at a depth of 10 to 30 inches during dry periods. The available water capacity is moderate to high. Reaction is medium acid or slightly acid in the surface and subsurface layers and ranges from medium acid to moderately alkaline in the subsoil. Natural fertility is low. Plant response to fertilizer is good.

Typically, this Paisley soil is in the Cabbage Palm Flatwoods range site. This site is readily identified by scattered pines and cabbage palms that have an understory of palmetto and grasses. This range site is similar to the South Florida Flatwoods range site, but it has a higher percentage of herbaceous plants and cabbage palms. If grazing is controlled, this range site has the potential to produce significant amounts of creeping bluestem, lopsided indiangrass, chalky bluestem, switchgrass, and various panicum species. If the range deteriorates as a result of poor grazing management, saw palmetto and pineland threeawn (wiregrass) will dominate the site.

This soil is poorly suited to cultivated crops because of wetness. With adequate drainage, this soil is suited to several important crops, including citrus trees. A water control system is needed and should be designed to rapidly remove excess surface water and internal water. A crop rotation system is needed that keeps the soil covered with close-growing, soil-improving crops at least two-thirds of the time. These crops and crop residue should be plowed under to help maintain or increase the content of organic matter in the soil. Fertilizer and lime should be applied according to the need of the crop.

This soil is well suited to pasture and hay crops. Bahiagrass, tall fescue grass, and clover are well adapted to this soil. Management practices needed on this soil include water control, fertilizing, liming, and controlled grazing.

This soil has a very high potential for the production of pine trees. The primary concerns in management are equipment use and high seedling mortality. Slash pine is a recommended tree to plant for commercial wood production.

Careful planning is required to correct the wetness limitation if this soil is used as septic tank absorption fields and for lawns, golf courses, and landscaping. Wetness and the high shrink-swell potential of the subsoil must be considered before planning for the construction of dwellings, commercial buildings, and local roads and streets.

This Paisley soil is in capability class IIIw. The woodland ordination symbol for this soil is 13W.

64—Citronelle fine sand. This soil is nearly level and somewhat poorly drained. It is on the flatwoods. Limestone bedrock is at a depth of 20 inches or less. The mapped areas are irregular in shape and range from 10 to 100 acres.

Typically, the surface layer is dark yellowish brown fine sand 2 inches thick. The subsoil to a depth of 9 inches is yellowish red fine sand underlain by limestone bedrock.

Included with this soil in mapping are areas of Boca, Broward, and Hallandale soils. Within the map unit are randomly scattered rock outcrops. Rock outcrops range from 2 square feet to about 10 square feet. In some areas, the bedrock has been broken off and the surface layer is cobbly fine sand. The included soils make up 25 percent of the map unit.

The high water table is within 2 to 3 feet of the surface for periods of up to 4 months. In drained areas, the water level fluctuates with the water level in the drainage ditches. Permeability is moderate to moderately rapid. Runoff is slow. Reaction ranges from strongly acid to moderately alkaline. Natural fertility is low. Plant response to fertilizer is moderate.

Typically, this Citronelle soil is in the Cabbage Palm Flatwoods range site. This site is readily identified by scattered pines and cabbage palms that have an understory of palmetto and grasses. This range site is similar to the South Florida Flatwoods range site, but it has a higher percentage of herbaceous plants and cabbage palms. If grazing is controlled, this range site has the potential to produce significant amounts of creeping bluestem, lopsided indiangrass, chalky bluestem, switchgrass, and various panicum species. If the range deteriorates as a result of poor grazing management, saw palmetto and pineland threeawn (wiregrass) will dominate the site.

This soil is not suited to most cultivated crops. Wetness, depth to bedrock, and low fertility are severe limitations. These limitations are difficult to overcome. In addition, included areas of rock outcrop limit the use of equipment on the soil.

This soil is moderately suited to improved pasture in areas without rock outcrop. Pangolagrass, improved bahiagrasses, and clover grow well if properly managed. Water-control measures, such as shallow ditches, should be installed to remove excessive surface water. Regular applications of fertilizer and lime are needed. Controlled grazing prevents overgrazing and helps to maintain plant vigor for maximum yields.

In areas where rock outcrop is not extensive, this soil has a moderate potential for the production of pine trees. Moderate concerns in management are equipment use and seedling mortality. Slash pine is the most suitable tree to plant for commercial wood production.

This soil has severe limitations for urban usage. Depth to bedrock is the main problem. If permitted, structures, such as elevated and mounded septic tank absorption fields, can be used to provide functional, nonpolluting sanitary systems. Because of the depth to bedrock, the excavation of this soil is difficult. Depth to bedrock is also a limitation to use of this soil for sanitary landfills or sewage lagoons. If this soil is used for sanitary landfills or sewage lagoons, the facilities should be sealed to help prevent contamination of the ground water. Landscaping and other plantings generally require the reworking of available soil materials and adding fill material to increase the rooting depth.

This Citronelle soil is in capability subclass IVs. The woodland ordination symbol for this soil is 8W.

Prime Farmland

In this section, prime farmland is defined and discussed, and the prime farmland soils in Citrus County are listed.

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

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

Prime farmland soils may presently be in use as cropland, pasture, or woodland, or they may be in other uses. They either are used for producing food or fiber or are available for these uses. Urban or built-up land, public land, and water areas cannot be considered prime farmland.

Prime farmland soils usually get an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The acidity or alkalinity level of the soils is acceptable. The soils have few or no rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods and are not subject to frequent flooding during the growing season. The slope ranges mainly from 0 to 6 percent.

The supply of high-quality farmland is limited. About 1,000 acres in Citrus County, or less than 1 percent of the county, is prime farmland. These areas are generally irregular in shape and less than 50 acres in size. They are located in the south-central section of Citrus County. Currently this land is dominantly used for pastureland and forest land.

The following map unit, or soil, makes up prime farmland in Citrus County. The location of each map unit is shown on the detailed soil maps at the back of this publication. The extent of each unit is given in table 3. The soil qualities that affect use and management are described in the section "Detailed Soil Map Units." This list does not constitute a recommendation for a particular land use.

Soils that have a high water table, are subject to flooding, or are droughty may qualify as prime farmland if these limitations or hazards are overcome by such measures as drainage, flood control, or irrigation. In the following list, the measures needed to overcome the limitations or hazards of a map unit are shown in parentheses after the map unit name. Onsite evaluation is necessary to determine the effectiveness of corrective measures. More information on the criteria for prime farmland soils can be obtained at the local office of the Soil Conservation Service.

The map unit that meets the requirements for prime farmland is:

33 Micanopy loamy fine sand, 2 to 5 percent slopes (where drained)

Use and Management of the Soils

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

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

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

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

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

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

Crops and Pasture

Mark Stephen Barrow, Animal and Plant Science specialist, Citrus County Cooperative Extension Service, helped to prepare this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the 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.

Pastures in the county produce forage for beef cattle, goats, and horses. Beef cattle cow-calf operations are the main livestock enterprise. Bahiagrass is the main pasture plant. Many ranches use improved bermudagrass and pangolagrass for hay crops. Harvest of grass seed and sod are important to some farms in the county. Cool-season annuals, such as rye and oats, are used for winter and spring forage. These small grains can be seeded after a vegetable or row crop, used in a pasture renovation program, or overseeded into a perennial grass sod. Important summer annual legumes are hairy indigo and alyceclover, which are seeded along or overseeded into a sod. Perennial peanuts is a new perennial legume that shows promise and is well adapted to the well drained soils in Citrus County, such as Apopka and Arredondo soils. Differences in the amount and kind of pasture yields are related closely to the suitability of a soil for pasture use. Management of pasture is based on the relationship of soils, pasture plants, lime, fertilizer, moisture, and grazing systems. Pasture in many parts of the county is greatly depleted by continuous, excessive grazing. Yields can be increased by adding lime and fertilizer, by including grass-legume mixtures in the cropping systems, and by using other management practices such as proper grazing.

Special crops grown in the county are citrus fruits, vegetables, deciduous fruits, and some ornamental plants. Oranges are the most important citrus crop. Small acreages are in grapefruit, tangerines, and lemons. Most of the citrus is grown in the southeast section of the county around the lakes. All areas of the county are subject to freeze damage. The main vegetable crop is watermelons. Many other vegetable crops, such as sweet corn, strawberries, tomatoes, peppers, and peas, are grown on small acreages. Several small acreages of deciduous fruit crops, such as blueberries, grapes, peaches, pears, and apples are grown in the county. Blueberries and grapes are especially promising in the area. All fruit and vegetables crops should be irrigated to insure maximum yields.

Field crops that are suited to the soils and climate of Citrus County include many that are not commonly grown. Only small acreages of field crops are grown. Corn, soybeans, peanuts, grain sorghum, and small grains can be grown if conditions are favorable.

Soil erosion is a concern on about two-thirds of the cropland and pasture in Citrus County. It can be a hazard on soils that have slopes of more than 2 percent. Loss of the surface layer through erosion is damaging for two reasons. First, productivity is reduced as the surface layer is lost and part of the subsoil or subsurface layer is incorporated into the plow layer. The loss of the surface layer is especially damaging on soils that have a clayey subsoil, such as Micanopy and Williston soils. Also, erosion caused by loss of the surface layer reduces productivity on soils that tend to be droughty, such as Astatula, Candler, and Fort Meade soils. Second, soil erosion on farmland results in sediment entering streams. Control of erosion minimizes the pollution of streams by sediment and improves the quality of water for municipal use, for recreation, and for fish and wildlife.

Erosion control practices provide protective surface cover, reduce runoff, and increase water infiltration. A cropping system that keeps vegetative cover on the soil for extended periods can hold soil erosion losses to amounts that will not reduce the productive capacity of the soils. On livestock farms that require pasture and hay, the including of legume and grass forage crops in the cropping system reduces erosion on sloping lands, provides nitrogen, and improves soil tilth.

Slopes are so short and irregular that contour tillage or terracing is not practical in some areas. In these areas, a cropping system that provides substantial vegetative cover is needed to control erosion. Minimizing tillage and leaving crop residue on the surface increase infiltration and reduce the hazards of runoff and erosion. These practices can be adapted to most soils in the county.

Terraces and diversions reduce the length of slope and thus reduce runoff and erosion. These conservation practices are most practical on deep, well drained soils that have regular slopes and are less suitable on other soils that have more irregular slopes. Soils that have a clayey subsoil that would be exposed in terrace channels, soils that are too sandy, or soils that have limestone at a depth of less than 40 inches are not suitable for terracing. Contour stripcropping is an erosion control practice that is effectively used in the county. This practice is better adapted to soils that have smooth, uniform slopes.

Soil blowing is a hazard in many areas of deep, sandy soils, such as Candler, Lake, and Orsino soils. It can damage these soils in a few hours if winds are strong and the soils are dry and bare of surface cover. In such areas, maintaining a vegetative cover minimizes soil blowing. Stripcrops of small grains are also effective in reducing wind erosion and crop damage.

Water control is a major management need on land used for crops and pasture. Many of the soils in the county are poorly drained or very poorly drained. In most years, they are too wet for crops commonly grown in the area. These soils that are sandy also have a low available water capacity and are droughty during dry periods. For intensive row cropping, a combination of surface drainage and subsurface irrigation is needed on most of the poorly drained soils. The design of surface drainage and irrigation systems varies with the kind of soil and the crop grown. More information about water control and practices to prevent wind erosion is available at the local office of the Soil Conservation Service.

Most crops grown on the excessively drained sandy soils in the center part of the county would require some form of sprinkler or drip irrigation system to insure satisfactory yields. Most of these soils are very droughty with very low available water capacity. Soil fertility is naturally low in most of the sandy soils. Most soils in the county are very strongly acid. If they have never been limed, applications of ground limestone are needed for ample growth of legumes and other crops. Nitrogen and available phosphorus and potash levels are naturally low in most of the mineral soils. Natural soil fertility, however, changes as the soil is used. On all soils, additions of lime and fertilizer should be based on the results of soil tests, on the need of the crop, and on the expected level of yields. The Cooperative Extension Service can help in determining the kinds and amounts of fertilizer and lime to apply.

Soil tilth is an important factor in the germination of seeds and in the infiltration rate of water into the soil. Soils that have good tilth are granular and porous. Most of the soils used for crops in Citrus County have a sandy surface texture and are low in organic matter. Regular additions of crop residue, manure, and other organic matter improve soil structure and increase the available water capacity of these soils.

The acreage in crops and pastures is gradually decreasing as more land is used for urban development.

The total acreage in farms has decreased from 118,175 acres in 1964, to 97,819 in 1978, and to 93,183 in 1982 *(24)*.

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 4. 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 4 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 capability classification of each map unit is given in the section "Detailed Soil Map Units" and is shown in table 4.

Rangeland and Grazeable Woodlands

R. Gregory Hendricks, range conservationist, Soil Conservation Service, helped to prepare this section.

In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland and grazeable woodlands are closely related to the kind of soil. Effective management is based on the relationship between the soils, vegetation, and water.

Native grasses are an important part of the overall, year-round supply of forage to livestock producers in itrus County. This forage is readily available. It is economical and provides important roughage needed by cattle, which are the principal grazing livestock produced in the area. About 175,000 acres throughout the county is available as native rangeland to cattle producers. Of this acreage, 140,000 acres is used strictly as rangeland. The remaining 35,000 acres is used by cattle interest in association with pulp and timber operations as grazeable woodlands.

Rangeland

The dominant native forage plants that naturally grow on a soil generally are the most productive and the most suitable for livestock. These plants will maintain themselves as long as the environment does not change.

The native forage plants are grouped into three categories according to their response to grazing-decreasers, increasers, and invaders.

Decreasers generally are the most abundant and most palatable plants on a given range site that is in good and excellent condition. They decrease in abundance if the rangeland is under continuous heavy grazing. *Increasers* are plants less palatable to livestock. They increase for a short time under continuous heavy grazing but eventually decrease. *Invaders* are plants native to rangeland. Only small amounts of these plants are on the rangeland, and they have very little forage value. Invaders tend to increase and become the new dominant plants as the decreaser and increaser plants are grazed out.

Table 5 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 are suited to use as rangeland are listed. Explanation of the column headings in table 5 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 natural plant community. Potential annual 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.

Characteristic vegetation is the grasses, forbs, and shrubs that make up most of the climax plant community on each soil (fig. 7). The amount that can be used as forage depends on the kinds of grazing animals and on the grazing season.

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 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 four condition classes used to measure range condition are—

- Excellent condition—producing 76 to 100 percent of the potential
- Good condition—producing 51 to 75 percent of the potential
- Fair condition—producing 26 to 50 percent of the potential
- Poor condition—producing 0 to 25 percent of the potential

Approximately 15 percent of the rangeland in Citrus County is in good and excellent condition. About 85 percent is in poor and fair condition.

The productivity of soils is closely related to the natural drainage of the soil. The wettest soils, such as those in freshwater and saltwater marshes, produce the most vegetation. The deep, droughty, sandy soils normally produce the least forage annually.

Management of the soils for range should be planned with potential productivity in mind. Soils with the highest production potential should be given highest priority if economic considerations are important.

The objective in range management is to control grazing so that the native plants growing on a site are about the same in kind and amount as the climax plant community for that site. Such management generally results in the optimum production of vegetation, conservation of water, and control of erosion. The length of time an area should be grazed, the season it should be used, how long and when the range should be rested, the grazing pattern of livestock in a pasture that contains more than one soil, and the palatability of the dominant plants on the soil are basic considerations if the rangeland is to be improved or maintained.

Figure 7.—Myakka fine sand is in the South Florida Flatwoods range site. It is identified by scattered pine trees with an understory dominated by saw palmetto.

Rangeland improvement practices, such as mechanical brush control, controlled burning, and especially controlled livestock grazing, benefit Florida's rangelands. Predicting the effects of these practices is of utmost importance. Without exception, the proper management of range will result in maximum sustained production and conservation of the soil and water resources with improvement of the habitat for many wildlife species.

Grazeable Woodland

Grazeable woodland is forest that has an 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 it 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 within the reach of livestock or of grazing or browsing wildlife. A well managed woodland area can produce enough vegetation to support optimum numbers of livestock or wildlife.

Forage production of grazeable woodland varies according to the different kinds of grazeable woodland; the amount of shade cast by the canopy and the accumulation of fallen needles; the influence of time and intensity of grazing on grasses and forage production;

the number, size, and spacing of tree plantings and method used for site preparation.

Woodland Management and Productivity

Bruce Hill, Citrus County forester, Florida Division of Forestry, helped to prepare this section.

This section provides information about the use of soils for trees. It can help woodland owners and operators to better understand the capabilities of soils to produce trees and can assist them in planning maximum productivity.

Forestry has played an important role in the economic development of the county. Prior to early settlement, the land was covered by vast stands of virgin forest. The rolling uplands were dominated by longleaf pine. Slash pine was on the more moist flatwoods. Baldcypress and pondcypress, basswood, sweetgum, red maple, hickory, ash, elm, and various oaks were the principal trees on the river flood plains and in the swamps.

Harvesting timber, collecting naval stores, and cutting railroad crossties had provided many jobs to area residents. However, in the past, timber cutting practices failed to provide for adequate regeneration of commercially important tree species. Also, exclusion of fire from the woods has allowed undesirable hardwoods to invade, further inhibiting reestablishment of pine trees.

As a result, the area has seen a decline in the availability of wood from private forest lands. The 1980 United States Department of Agriculture, Forest Service, Statistics for Central Florida indicated that approximately 236,000 acres of commercial forest land was in Citrus County. Of this, more than 75 percent of the land was supporting less than 60 percent of the timber that it was capable of supporting.

However, continuing timber sales from the 41,000 acre Citrus Tract of the Withlacoochee State Forest has helped maintain commercial interest in local forest resources, and the opening of new pulpmills, sawmills, and veneermills in South Georgia and Florida has increased the demand for and the value of local woodland products.

A strong demand for timber is expected to continue well into the next century. This anticipated market and pressures to increase overall farm revenues prompted many ranchers and landowners to incorporate forest management in their production strategies. In addition, Federal cost-share programs, income tax credits, favorable capital gains treatment, and the qualification of timberlands for agricultural real estate tax exemptions have recently increased the number of acres brought into timber production.

To profit most from an investment in timber growing, a decision must be made as to which trees to grow. This conclusion should be reached through the evaluation of soil productivity as it relates to tree growth. This is determined mainly by the physical qualities of the soil. One of the most important considerations that affects productive capacity is the ability of the soil to provide adequate moisture. Other factors include the thickness of the surface layer and its organic matter content; the natural supply of plant nutrients; the texture and consistency of the soil material; the aeration; the internal drainage; and the depth to the water table. Detailed information on soils and forest management can be obtained from the local offices of the Soil Conservation Service and the Florida Division of Forestry.

A well managed stand of trees prevents soil deterioration and helps to conserve soil and water resources. The main function of good trees is to protect the soil. Trees slow the fall of rain and allow the soil to absorb more moisture. Erosion is not a problem on most forest land in the county, but the ability of tree cover to allow more moisture to enter the soil is important to maintaining ground water supplies. Properly managed forests are an important part of the economy of the county. Practices to be considered in achieving proper management are discussed briefly in this section.

Trees and ground cover are destroyed by uncontrolled wildfires. Growth is slowed in trees that are not killed, or they can be scarred. This allows the entry of insects and diseases, particularly in stands of hardwoods. Fire lessens the ability of the soil to absorb water and consumes litter that contributes organic matter to the soil.

Countrywide fire protection is furnished by the State Division of Forestry. Individual landowners, however, should observe all rules of fire protection. Firebreaks should be constructed and maintained around and through all woodlands. These firebreaks can slow or stop a fire under normal conditions. Prescribed burning should be practiced with the advice and assistance of the State Division of Forestry or qualified consultant foresters.

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 are major influences of tree growth. Elevation and aspect are of particular importance in mountainous areas.

This soil survey can be used by woodland managers planning ways to increase the productivity of forest land. Some soils respond better to fertilization than others, some are more susceptible to landslides and erosion after building roads and harvesting timber, and some require special efforts to reforest. In the section "Detailed Soil Map Units," each map unit in the survey area suitable for producing timber presents information about productivity, limitations for harvesting timber, and management concerns for producing timber. The common forest understory plants are also listed. Table 6 summarizes this forestry information and rates the soils for a number of factors to be considered in management. *Slight, moderate*, and *severe* are used to indicate the degree of the major soil limitations to be considered in forest management.

The first tree listed for each soil under the column "Common trees" is the indicator species for that soil. An indicator species is a tree that is common in the area and that is generally the most productive on a given soil.

Table 6 lists the *ordination symbol* for each soil. The first part of the ordination symbol, a number, indicates the potential productivity of a soil for the indicator species in cubic meters per hectare. The larger the number, the greater the potential productivity. Potential productivity is based on the site index and the point where mean annual increment is the greatest.

The second part of the ordination symbol, a letter, indicates the major kind of soil limitation for use and management. The letter *W* indicates a soil in which excessive water, either seasonal or year-round, causes a significant limitation. The letter *S* indicates a dry, sandy soil. The letter *A* indicates a soil that has no significant restrictions or limitations for forest use and management. 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.

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 seedings. Reinforcement planting is often needed if the risk is *moderate* or *severe*.

Ratings of *plant competition* indicate the likelihood of the growth or invasion of undesirable plants. *Plant competion* becomes more severe on the more productive soils, on poorly drained soils, and on soils having a restricted root zone that holds moisture. The risk is *slight* if competition from undesirable plants reduces adequate natural or artificial reforestation but does not necessitate intensive site preparation and maintenance. The risk is *moderate* if competition from undesirable plants reduces natural or artificial reforestation to the extent that intensive site preparation and maintenance are needed. The risk is *severe* if competition from undesirable plants prevents adequate natural or artificial reforestation unless the site is intensively prepared and maintained. A *moderate* or *severe* rating indicates the need for site preparation to ensure the development of an adequately stocked stand. Managers must plan site preparation measures to ensure reforestation without delays.

The potential productivity of *common trees* on a soil is expressed as a *site index*. Common trees are listed in the order of their observed general occurrence. Generally, only two or three tree species dominate.

The soils that are commonly used to produce timber have the yield predicted in cubic feet and board feet. The yield is predicted at the point where mean annual increment culminates. The productivity of the soils in this survey is mainly based on 50 years for all species.

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 doing this are given in the site index tables used for the Citrus County soil survey *(6, 13, 16, 18, 21)*.

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.

Recreation

In table 7, the soils of the survey area are rated according to the limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public 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 7, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

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

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

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

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

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

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

Wildlife Habitat

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

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.

The soils in Citrus County support a wide diversity of plants which are productive for a variety of wildlife species. The habitat includes pine forests, hardwood forests, mixed hardwood and pine forests, marshes, improved pastures, cropland, and areas of natural vegetation used as rangeland. The abundant freshwater lakes, rivers, and coastal waters are also important to the overall ecology of the wildlife in the county.

The main game species in the county include white-tailed deer, wild turkey, quail, doves, and waterfowl. Nongame species include squirrel, raccoon, rabbit, armadillo, opossum, skunk, bobcat, gray fox, otter, mink, and a variety of songbirds, woodpeckers, predatory birds, wading birds, reptiles, and amphibians. Good habitat for wildlife is available in most areas of Citrus County except where urban development has encroached. A wide variety of fish, freshwater and saltwater, provide for good fishing.

Areas of important habitat for wildlife include the 41,000 acre Citrus Wildlife Management Area, the 23,730 acre Chassahowitzka National Wildlife Refuge, the swamps along the Withlacoochee River, and the large coastal marsh areas. The large Tsala-Apopka lake chain, the Withlacoochee River, and Lake Rousseau not only provide excellent fishing for largemouth bass, sunfish, white crappie or black crappie, and catfish, but their swamp and marsh fringe areas also provide valuable habitat for terrestrial wildlife species. The Homasassa River and Crystal River provide good fishing for both saltwater and freshwater species, and their warm waters also provide critical wintering habitat for the endangered manatee. The Nature Conservancy's Kings Bay Sanctuary at Crystal River harbors the largest wintering population of manatees in the United States.

The increasing rate of habitat for wildlife lost to urban development, mainly in the coastal areas and in the north-central part of Citrus County, is a major concern in wildlife management.

Many endangered and threatened species are in Citrus County. They range from the seldom seen red-cockaded woodpecker to the more commonly apparent species, such as the alligator and the manatee. A more detailed list of these species with information on range and habitat needs is available from the district conservationist at the local office of the Soil Conservation Service.

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

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

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

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, soybeans, wheat, browntop millet, and grain sorghum.

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

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

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

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

Shrubs are bushy woody plants that produce fruit, buds, twigs, bark, and foliage. Soil properties and features that affect the growth of shrubs are depth of the root zone, available water capacity, salinity, and soil moisture. Examples of shrubs are mountainmahogany, bitterbrush, snowberry, and big sagebrush.

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

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

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

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

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

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

Engineering

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

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

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

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

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, 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 9 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not as favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are unfavorable or difficult to overcome and require special design, significant increases in construction costs, and increased maintenance. Special feasibility studies may be required where the soil limitations are severe.

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

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, 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, frost-action potential, and depth to a high water table affect the traffic-supporting capacity.

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

Table 10 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and that good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

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

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

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

Table 10 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, depth to a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage 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 10 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 11 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

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

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help 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 11, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

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

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

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

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

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

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

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal 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 12 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not as favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are unfavorable or difficult to overcome and require special design, significant increase in construction costs, and increased maintenance.

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.

Soil Properties

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

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics. These results are reported in table 19.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help 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 13 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

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

The A-1, A-2, and A-7 groups can be further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20, or higher, for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 19.

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

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

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They influence the soil's adsorption of cations, moisture retention, shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

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

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

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

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

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. 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 wind erosion and the amount of soil lost. Soils are grouped according to the following distinctions:

1. Sands, coarse sands, fine sands, and very fine sands. These soils are generally not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.
2. Loamy sands, loamy fine sands, and loamy very fine sands. These soils are very highly erodible. Crops can be grown if intensive measures to control wind erosion are used.
3. Sandy loams, coarse sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control wind erosion are used.
4. Clays, silty clays, clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control wind erosion are used.

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

In table 14, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

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

Hydrologic soil groups are used to estimate runoff from precipitation. Soils 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.

The two hydrologic soil groups, B/D, are given for certain wet soils that can be adequately drained. The first letter applies to the drained condition. The second to the undrained condition.

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

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

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

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 the water table exists for less than a month.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

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 15 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

By Dr. Victor W. Carlisle and Dr. Mary E. Collins, professor and assistant professor, respectively, University of Florida, Soil Science Department, prepared this section.

Parameters for physical, chemical, and mineralogical analyses of representative pedons sampled in Citrus County are presented in tables 16, 17, and 18. The analyses were conducted and coordinated by the Soil Characterization Laboratory at the University of Florida. Detailed profile descriptions of soils analyzed are given in the section "Soil Series and Their Morphology." Laboratory data and profile information for other soils in Citrus 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 *(20)*.

Particle-size distribution was determined using a modified pipette method with sodium hexametaphosphate dispersion. Hydraulic conductivity and bulk density were determined on undisturbed soil cores. Water retention parameters were obtained from duplicate undisturbed soil cores placed in tempe pressure cells. Weight percentages of water retained at 100 centimeters water (1/10 bar) and 345 centimers water (1/3 bar) were calculated from volumetric water percentages divided by bulk density. Samples were oven-dried and ground to pass a 2 millimeter sieve, and the 15-bar water retention was determined. Organic carbon was determined by a modification of the Walkley-Black wet combustion method.

Extractable bases were obtained by leaching soils with normal ammonium acetate buffered at pH 7.0. Sodium and potassium in the extract were determined by flame emission. Calcium and magnesium in the extract were determined by atomic absorption spectrophotometry. Extractable acidity was determined by the barium chloride-triethanolamine method at pH 8.2. Cation-exchange capacity was calculated by summation of extractable bases and extractable acidity. Base saturation is the ratio of extractable bases to cation-exchange capacity expressed in percent. The pH measurements were made with a glass electrode using a soil-water ratio of 1:1, 0.01 molar calcium chloride solution in a 1:2 soil-solution ratio; and normal potassium chloride solution in a 1:1 soil-solution ratio.

Electrical conductivity determinations were made with a conductivity bridge on 1:1 soil to water mixtures. Iron and aluminum extractable in sodium dithionite-citrate were determined by atomic absorption spectrophotometry. Aluminum, carbon, and iron were extracted from a probable spodic horizon with 0.1 molar sodium pyrophosphate. The determination of aluminum and iron was by atomic absorption and extracted carbon by the Walkley-Black wet combustion method.

Mineralogy of the clay fraction less than 2 microns was ascertained by X-ray diffraction. Peak heights at 18 angstrom, 14 angstrom, 7.2 angstrom, 4.83 angstrom, 4.31 angstrom, and 3.04 angstrom positions represent montmorillonite, interstratified expandable vermiculite, or 14-angstrom intergrades, kaolinite, gibbsite, quartz, and calcite, respectively. Peaks were measured, summed, and normalized to give the percent of the 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.

According to the physical soil analyses as presented in table 16, sands are the dominant particle-size fractions in nearly all horizons in most soils in Citrus County. Adamsville, Astatula, Candler, Lake, Myakka, and Tavares soils were more than 95 percent sand to a depth of more than 2 meters. The content of clay was less than 3 percent in these soils. Arredondo, EauGallie, and Sparr soils were more than 90 percent sand to a depth of slightly more than 1 meter. Fort Meade, Hallandale, and Redlevel soils were more than 80 percent sand throughout.

A high content of clay, ranging from 30.2 percent to 68.2 percent, was within 2 meters of the surface of Kendrick, Lochloosa, and Micanoy soils. Clay, which ranged from 19.9 to 63.6 percent, was at a depth of more than 1 meter in Arredondo, EauGallie, Kendrick, Lochloosa, Micanopy, and Sparr soils. Clay generally tends to move downward with percolating water, therefore, the amount of translocated clay often reveals the state or degree of soil development.

The content of silt in Adamsville, Arredondo, Astatula, Candler, EauGallie, Lake, Myakka, and Tavares soils was less than 4.5 percent. The content of silt was more than 10 percent in one horizon or more of Fort Meade, Lochloosa, and Micanopy soils.

Fine sands are the dominant sand fractions in the soils in Citrus County. These soils have one horizon or more that contains more than 50 percent fine sand. Very coarse sand was nondetectable in most soils, the content of coarse sand generally was less than 2 percent, and the content of medium sand and very fine sand was less than 15 percent in all but a few of the soils in the county.

Very low hydraulic conductivity values of less than 5 centimeters per hour were recorded throughout Micanopy soil, in the Bt horizon of Arredondo, Hallandale, Kendrick, Lochloosa, and Sparr soils, and in the spodic horizons of EauGallie and Myakka soils. The high content of clay in the lower horizons of Kendrick, Lochloosa, Micanopy, and Sparr soils resulted in some hydraulic conductivity values of less than 1 centimeters per hour. Design and function of septic tank absorption fields are affected by such low hydraulic conductivity values. The available water capacity for plants can be estimated from bulk density and water content data. Relatively high content of organic carbon in the surface horizons of EauGallie, Fort Meade, Hallandale, and Myakka soils resulted in correspondingly high available water capacity values. Excessively sandy soils, such as Adamsville, Astatula, Candler, Lake, and Tavares soils, generally have a low content of organic matter and low available water capacity for plants. Droughtiness is a common characteristic of sandy soils, particularly those that are moderately well-drained, well-drained, and excessively well-drained.

According to the chemical soil analyses as presented in table 17, a low amount of extractable bases is present in most soils in Citrus County. Astatula, Candler, Lake, and Tavares soils contained less than 1 milliequivalent per hundred grams extractable bases throughout. Similarly, Adamsville, Arredondo, Fort Meade, and Sparr soils contained less than 2 milliequivalents per hundred grams extractable bases throughout, and Kendrick and Redlevel soils contained less than 3 millequivalents per hundred grams extractable bases. Some horizons in Durbin, Hallandale, and Micanopy soils contained more than 10 milliequivalents per hundred grams extractable bases. The mild, humid climate of Citrus County results in depletion of basic soil cations (calcium, magnesium, sodium, and potassium) through leaching.

Calcium was the dominant base in all soils in Citrus County except Durbin muck. Magnesium occurred in amounts exceeding 1 milliequivalent per hundred grams in some horizons of Durbin, EauGallie, Hallandale, Kendrick, Lochloosa, Micanopy, and Myakka soils. A much lower but detectable amount of magnesium occurred throughout all other soils in the county. Sodium generally occurred in amounts of less than 0.1 milliequivalent per hundred grams; however, sodium content exceeded 1 milliequivalent per hundred grams in the Hallandale soil and 50 milliequivalents per hundred grams in the Hallandale soil and 50 milliequivalents per hundred grams in the Durbin muck. Most soils in Citrus County contained very low amounts of potassium. Potassium was nondetectable in some horizons of Adamsville, Arredondo, Astatula, Candler, EauGallie, Lake, Myakka, and Tavares soils. Only Durbin muck contained more than 1 milliequivalent per hundred grams extractable potassium. Values for cation-exchange capacity, an indication of the available nutrient capacity of plants, exceeded 10 milliequivalents per hundred grams in the surface horizon and at least one horizon below the surface of Durbin, EauGallie, Fort Meade, Hallandale, Lochloosa, Micanopy, and Myakka soils. In addition to these soils, Kendrick soil contained a Bt horizon that exceeded 10 milliequivalents per hundred grams cation-exchange capacity. Soils that have low cation-exchange capacity in the surface horizon, such as in Adamsville, Astatula, Candler, and Tavares soils, require only small amounts of lime to significantly alter the base status and soil reaction in the upper horizons. Generally, soils of low inherent soil fertility are associated with low values for extractable bases and low cation-exchange capacities, and fertile soils are associated with high values for extractable bases, high base saturation values, and high cation-exchange capacities.

The content of organic carbon was more than 3 percent throughout Durbin soil and in the surface horizons of EauGallie, Fort Meade, Hallandale, and Myakka soils. The content of organic carbon was less than 1.5 percent throughout Adamsville, Arredondo, Astatula, Candler, Kendrick, Lake, Lochloosa, Redlevel, Sparr, and Tavares soils. In mineral soils, the content of organic carbon decreased rapidly with increased depth except in Myakka soil. This soil has a Bh horizon that contains a high amount of organic carbon. Since organic carbon is directly related to soil nutrient and the water retention capacity of sandy soils, management practices that conserve and maintain organic carbon are highly desirable.

Electrical conductivity values generally were very low, exceeding 0.1 millimhos per centimeter, in Durbin and Hallandale soils. These data indicate that soluble salt content of the soils in Citrus County are insufficient to detrimentally affect the growth of salt-sensitive plants except in the immediate coastal area.

Soil reaction in water generally ranged between pH 4.5 and 6.0; however, much higher reaction value was recorded for the Bt horizon of the Hallandale soil, which contained a large amount of extractable bases and a low extractable acidity value. With few exceptions, soil reaction was 0.5 to 1.0 pH units lower in calcium chloride and potassium chloride than in water. The maximum availability of nutrients for plants is generally attained when soil reaction is between pH 6.5 and 7.5; however, under Florida conditions, maintaining soil reaction above pH 6.5 is not economically feasible for most agricultural production purposes.

Sodium pyrophosphate extractable iron was 0.02 percent or less in the Bh horizon of EauGallie and Myakka soils. The ratio of pyrophosphate extractable carbon and aluminum to clay in these soils was sufficient to meet the chemical criterial for a spodic horizon.

Citrate-dithionite extractable iron ranged from 0.01 percent in the Bh2 horizon of Myakka soil to 1.41 percent in the Bt2 horizon of Micanopy soil. Aluminum extracted by citrate-dithionite in a spodic horizon of Spodosols and in an argillic horizon of Alfisols and Ultisols ranged from 0.03 to 0.49 percent. The content of aluminum and iron in the soils in Citrus County is not sufficient to detrimentally affect phosphorus availability.

Sand fractions of 2 to 0.05 millimeters were siliceous with quartz overwhelmingly dominant in all soils in the county. Small amounts of heavy minerals occurred in most horizons that had the greatest concentration in the very fine sand fraction. No weatherable minerals were observed. Crystalline mineral components of the clay fraction of less than 0.002 millimeters are reported in table 18 for major horizons of the soils sampled. The clay mineralogical suite was composed of montmorillonite, a 14-angstrom intergrade, kaolinite, gibbsite, quartz, and calcite.

Montmorillonite occurred in about one-half of the soils sampled, but detectable amounts were not present in Adamsville, Arredondo, Fort Meade, Lake, Lochloosa, Redlevel, and Tavares soils. Detectable amounts were in all horizons for which determinations were made in Hallandale, Kendrick, Micanopy, and Sparr soils; but montmorillonite was not detectable in some horizons of Astatula, Candler, EauGallie, and Myakka soils. Most soils sampled in Citrus County were dominately 14-angstrom intergrade minerals and kaolinite. The 14-angstrom intergrades occurred in all soils sampled; however, 14-angstrom intergrades were nondetectable in the A1 and Bh1 horizons of EauGallie soil and in the Bh1 horizon of Myakka soil. Kaolinite occurred throughout the soils in the county. Gibbsite was detected only in the Candler soil. All soils contained varying amounts of quartz. Very small amounts of calcite were detected in EauGallie and Kendrick soils.

Montmorillonite appears to have been inherited by soils in Citrus County and is probably the least stable mineral component in the present weathering environment. Considerable volume changes can result from the shrinkage when dry and swelling when wet of the montmorillonitic subsoil of Micanopy soil. The occurrence of a relatively large amount of 14-angstrom intergrades and the general tendency for these minerals to decrease as soil depth increases suggest that the 14-angstrom intergrade minerals are among the most stable species in this weathering environment. The tendency of 14-angstrom minerals to decrease as soil depth increases is accompanied by a general, although inconsistent, tendency for kaolinite to increase indicates a severe weathering environment near the soil surface. Inconsistent occurrence of gibbsite and calcite is indicative of inherited properties. Clay-sized quartz has resulted from decrements of the silt fraction. Soils dominated by montmorillonite and 14-angstrom intergrades have a much higher cation-exchange capacity and retain more plant nutrients than soils dominated by quartz and kaolinite.

Engineering Index Test Data

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

The testing methods generally are those of the American Association of State Highway and Transportation Officials (AASHTO) or the American Society for Testing and Materials (ASTM).

The tests and methods are: AASHTO classification—M 145 (AASHTO), D 3282 (ASTM); Mechanical analysis—T 88 (AASHTO), D 2217 (ASTM); Liquid limit—T 89 (AASHTO), D 423 (ASTM); Plasticity index—T 90 (AASHTO), D 424 (ASTM); Moisture density, Method A—T 99 (AASHTO), D 698 (ASTM).

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(17)*. 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 20 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, hyperthemic 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. An example is the Pompano series which is a member of the siliceous, hyperthemic family of 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 (19)*. Many of the technical terms used in the descriptions are defined in *Soil Taxonomy (17)*. Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Adamsville Series

The Adamsville series consists of deep, nearly level, somewhat poorly drained, rapidly permeable soils that formed in sandy marine deposits. These soils are on low ridges of swamps and flatwoods and along the base of some lower slopes on the upland ridges. The slopes are 0 to 2 percent. Adamsville soils are hyperthermic, uncoated Aquic Quartzipsamments.

Adamsville soils are associated with Basinger, Candler, Immokalee, Myakka, Pompano, and Tavares soils. Basinger and Pompano soils are poorly drained. Candler soils are excessively drained. These soils have lamellae at a depth of more than 40 inches. Immokalee and Myakka soils are poorly drained. These soils have a Bh horizon. Tavares soils are moderately well drained.

Typical pedon of Adamsville fine sand; in a pasture, 0.6 of a mile west of U.S. Highway 19, 0.8 of a mile north of junction of U.S. Highways 19 and 98, NE1/4SW1/4 sec. 24, T. 20 S., R. 17 E.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) fine sand; weak medium granular structure; friable; few fine roots; very dark gray (10YR 3/1) along root channels; medium acid; gradual irregular boundary.

C1—7 to 20 inches; light yellowish brown (10YR 6/4) fine sand; few medium distinct brownish yellow (10YR 6/6) mottles; single grained; loose; few fine and medium roots; few light gray (10YR 7/2) vertical streaks about 2 centimeters wide; medium acid; gradual wavy boundary.

C2—20 to 39 inches; very pale brown (10YR 7/4) fine sand; common medium distinct brownish yellow (10YR 6/6) mottles; single grained; loose; few fine medium and coarse roots; medium acid; gradual wavy boundary.

C3—39 to 80 inches; very pale brown (10YR 7/3) fine sand; single grained; loose; medium acid.

The combined thickness of the A and C horizons is 80 inches or more. The content of silt and clay in the 10- to 40-inch control section is less than 5 percent. Reaction ranges from very strongly acid to mildly alkaline.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2; or it is neutral and has value of 2 to 5. In many pedons, the undisturbed A horizon is a mixture of light gray sand grains and finely divided organic material. Texture of the A horizon is fine sand. The A horizon is 3 to 8 inches thick.

The C horizon extends to a depth of 80 inches. It has hue of 10YR, value of 5 to 8, and chroma of 1 to 4. Typically, chromas of lower value are dominant in the lower part of the horizon. Some pedons have mottles of gray, yellow, or brown at a depth of more than 20 inches. Matrix colors are the result of uncoated sand grains or thin coatings of colloidal organic material on the sand grains. Texture is fine sand or sand.

Anclote Series

The Anclote series consists of deep, nearly level, very poorly drained, rapidly permeable soils that formed in sandy marine deposits. These soils are in depressions and low, nearly flat, poorly defined drainageways. The slopes are less than 2 percent. Anclote soils are sandy, siliceous, hyperthermic Typic Haplaquolls.

Anclote soils are associated with Basinger, Immokalee, Myakka, Pomello, and Pompano soils. These soils do not have a mollic epipedon. In addition, Immokalee, Myakka, and Pomello soils have a spodic horizon.

Typical pedon of Anclote fine sand, depressional; 1.7 miles south of Florida State Highway 44, 0.5 of a mile west of the Withlacoochee River, NE1/4NE1/4 sec. 21, T. 19 S., R. 21 E.

A1—0 to 7 inches; black (N 2/0) fine sand; weak medium granular structure; very friable, many fine roots; slightly acid; clear smooth boundary.

A2—7 to 14 inches; very dark gray (10YR 3/1) fine sand; common medium distinct dark gray (N 4/0) mottles; weak medium granular structure; very friable; many fine and medium roots; neutral; clear smooth boundary.

Cg1—14 to 20 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; few fine roots; neutral; gradual irregular boundary.

Cg2—20 to 32 inches; light brownish gray (10YR 6/2) fine sand; single grained; loose; few fine roots; neutral; gradual wavy boundary.

Cg3—32 to 80 inches; gray (10YR 6/1) fine sand; single grained; loose; neutral.

The content of silt and clay in the 10- to 40-inch control section is less than 15 percent. Reaction is strongly acid to moderately alkaline.

The A horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 or 2; or it is neutral and has value of 2 or 3. Few or common and fine or medium gray mottles or pockets of sand not coated with organic matter can occur in the lower part of the A horizon. The A horizon is 10 to 20 inches thick. The content of organic matter in the A horizon is 2 to 10 percent. Texture is dominantly fine sand.

The Cg horizon extends to a depth of 80 inches or more. It has hue of 10YR to 5Y, value of 2 to 7, and chroma of 1 or 2. Texture is sand, fine sand, or loamy fine sand.

Apopka Series

The Apopka series consist of deep, nearly level to gently sloping, well drained, moderately permeable soils that formed in sandy and loamy marine or eolian deposits. These soils are on rolling landscapes on the upland ridges. The slopes range from 0 to 5 percent. Apopka soils are loamy, siliceous, hyperthermic Grossarenic Paleudults.

Apopka soils are associated with Adamsville, Arredondo, Astatula, Candler, Immokalee, Kendrick, Lake, Myakka, Sparr, and Tavares soils. Adamsville, Astatula, Candler, Lake, and Tavares soils do not have an argillic horizon. In addition, Adamsville soils are somewhat poorly drained, and Astatula, Chandler, and Lake soils are excessively drained. Arredondo soils have 5 to 15 percent silt and clay in the E horizon. Immokalee and Myakka soils have a Bh horizon. These soils are poorly drained. Kendrick soils have an argillic horizon between depths of 20 and 40 inches. Sparr soils are similar to the Apopka soils but are somewhat poorly drained.

Typical pedon of Apopka fine sand, 0 to 5 percent slopes; in a wooded area, 3.4 miles west of U.S. Highway 41, 4.5 miles north of Citrus County Road 491, SW1/4NW1/4 sec. 29, T. 17 S., R. 18 E.

A—0 to 7 inches; very dark grayish brown (10YR 3/2) fine sand; weak fine granular structure; very friable; many fine and medium roots; medium acid; gradual wavy boundary.

E1—7 to 26 inches; yellowish brown (10YR 5/4) fine sand; single grained; loose; few fine and medium roots; medium acid; gradual wavy boundary.

E2—26 to 50 inches; light yellowish brown (10YR 6/4) fine sand; single grained; loose; few fine and medium roots; many uncoated sand grains; medium acid; abrupt wavy boundary.

Bt1—50 to 67 inches; strong brown (7.5YR 5/8) sandy clay loam; moderate medium subangular blocky structure; firm; few medium roots; sand grains coated and bridged with clay; medium acid; gradual wavy boundary.

Bt2—67 to 80 inches; red (2.5YR 5/8) sandy clay loam; moderate medium subangular blocky structure; firm; sand grains coated and bridged with clay; medium acid.

The solum is more than 60 inches thick. Reaction ranges from very strongly acid to medium acid except in the A horizon where lime has been applied. The combined thickness of the A and E horizons ranges from 40 to 75 inches.

The A horizon has hue of 10YR, value of 2 to 5, and chroma of 1 or 2. Texture is sand or fine sand. The A horizon is 4 to 8 inches thick.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 3 to 8. Texture is sand or fine sand. The content of silt and clay is less than 5 percent. Some pedons have gray or white mottles. These are the colors of the uncoated sand grains in the horizon.

The Bt horizon extends to a depth of more than 60 inches. It has hue of 2.5YR to 10YR, value of 4 to 6, and chroma of 4 to 8. Texture is sandy loam or sandy clay loam. In some pedons, 1 to 5 percent plinthite is in the Bt horizon.

Some pedons have BC horizon between depths of 60 and 80 inches. This horizon has the same range in color as the Bt horizon, or it is commonly mottled in those colors. Gray and white striped sand grains are common between peds. Texture in the BC horizon ranges from sandy loam to sandy clay.

Arredondo Series

The Arredondo series consists of deep, nearly level to moderately sloping, well drained, moderately permeable soils that formed in sandy and loamy marine deposits. These soils are on upland ridges. The slopes range from 0 to 8 percent. Arredondo soils are loamy, siliceous, hyperthermic Grossarenic Paleudults.

Arredondo soils are associated with Apopka, Astatula, Candler, Fort Meade, Kanapaha, Kendrick, Lake, Micanopy, Sparr, and Williston soils. Apopka soils have less than 5 percent silt and clay between depths of 10 to 40 inches. Astatula, Candler, Fort Meade, and Lake soils do not have a Bt horizon. In addition, Astatula, Chandler, and Lake soils are excessively drained. Kanapaha and Sparr soils are similar to Arredondo soils; but Kanapaha soils are poorly drained, and Sparr soils are somewhat poorly drained. Kendrick and Micanopy soils have a Bt horizon at a depth of less than 20 to 40 inches. In addition, Micanopy soils are somewhat poorly drained. Williston soils are underlain by limestone at a depth of less than 40 inches.

Typical pedon of Arredondo fine sand, 0 to 5 percent slopes; from an area of improved pasture, about 0.5 of a mile west of Citrus County Road 491, 1,000 feet south of a dirt road, NE1/4NW1/4 sec. 28, T. 19 S., R. 18 E.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) fine sand; weak medium granular structure; very friable; many fine roots; very strongly acid; abrupt wavy boundary.

E1—9 to 26 inches; dark yellowish brown (10YR 4/4) fine sand; single grained; loose; few fine and medium roots; few dark brown (10YR 3/3) vertical krotovinas about 5 centimeters in diameter; strongly acid; gradual wavy boundary.

E2—26 to 41 inches; yellowish brown (10YR 5/8) fine sand; single grained; loose; few dark brown (10YR 3/3) vertical krotovinas about 5 centimeters in diameter; strongly acid; gradual wavy boundary.

Bt1—41 to 65 inches; strong brown (7.5YR 5/6) loamy fine sand; weak medium granular structure; very friable; strongly acid; gradual wavy boundary.

Bt2—65 to 80 inches; strong brown (7.5YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; many sand grains coated with colloidal clay; few scattered uncoated sand grains; very strongly acid.

The solum is 80 inches or more thick. Reaction is very strongly acid to medium acid. In many pedons, few small, weathered limestone nodules and fragments, 2 to 20 millimeters in size, make up less than 5 percent, by volume, of the soils. The combined thickness of the A and E horizons is more than 40 inches.

The A or Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. Texture is sand, fine sand, loamy sand, or loamy fine sand. The thickness of the A horizon is 3 to 8 inches.

The E horizon has hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 3 to 8. Texture is fine sand, sand, loamy fine sand, or loamy sand. This horizon has 5 to 15 percent silt and clay within 10 to 40 inches of the surface.

Some pedons have an E/B horizon that has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. Texture ranges from sand to loamy fine sand. A slight increase of clay or some color change is in this horizon as compared to the E horizon.

The Bt horizon extends to a depth of 80 inches or more. The Bt1 horizon has hue of 7.5YR or 10YR, value of 4 or 6, and chroma of 4 to 8. Texture is loamy sand, loamy fine sand, fine sandy loam, or sandy loam. The Bt2 horizon has the same matrix colors as the Bt1 horizon. Texture ranges from sandy loam to sandy clay.

Astatula Series

The Astatula series consists of deep, nearly level to strongly sloping, excessively drained, very rapidly permeable soils that formed in unconsolidated sandy marine, eolian, and fluvial sediments. These soils are on the upland ridges. The landscape is somewhat undulating. The slopes are smooth to concave and range from 0 to about 8 percent. Astatula soils are hyperthermic uncoated Typic Quartzipsamments.

Astatula soils are associated with Arredondo, Candler, Lake, Paola, and Tavares soils. Arredondo soils have a Bt horizon and are well drained. Candler soils have discontinuous lamellae at a depth of more than 40 inches. Lake soils have more than 5 percent fines in the 10- to 40-inch control section. Paola soils have an albic horizon underlain by a discontinuous Bh horizon. Tavares soils are moderately well drained.

Typical pedon of Astatula fine sand, 0 to 5 percent slopes; in a forested area, 3 miles north of Florida State Highway 44, SW1/4NE1/4 sec. 12, T. 18 S., R. 17 E.

A—0 to 5 inches; light brownish gray (10YR 6/2) fine sand, single grained; loose; few fine roots; very dark gray (10YR 3/1) along root channels; about 2 centimeters of mixed, partly decomposed organic litter on surface; very strongly acid; abrupt smooth boundary.

C1—5 to 18 inches; yellow (10YR 7/6) fine sand; single grained; loose; few fine and medium roots; very dark gray (10YR 3/1) along root channels; very strongly acid; diffuse wavy boundary.

C2—18 to 47 inches; yellow (10YR 7/6) fine sand; single grained; loose; few fine medium and coarse roots; very strongly acid; gradual wavy boundary.

C3—47 to 80 inches; reddish yellow (7.5YR 7/8) fine sand; single grained; loose; few fine and medium roots; few scattered, vertical streaks (1 centimeter by 4 centimeters) of uncoated white (10YR 8/1) sand grains in lower 10 inches; very strongly acid.

The solum is more than 80 inches thick. The content of silt and clay between depths of 10 and 40 inches is less than 5 percent. Reaction ranges from very strongly acid to slightly acid.

The A horizon has hue of 10YR, value of 3 to 6, and chroma of 1 or 2. Cultivated areas have an Ap horizon that has value of 4 or less. The A horizon is fine sand. It is 2 to 7 inches thick. In some sloping areas, the A horizon has eroded away and the underlying C horizon is at the surface.

Some pedons have an AC horizon between the A and C horizons. This horizon is as much as 4 inches thick. It has hue of 10YR, value of 5 to 7, and chroma of 1; or hue of 10YR, value of 6 or 7, and chroma of 3 or 4. Texture is fine sand.

The C horizon has hue of 10YR, value of 5 to 8, and chroma of 3 to 8. Texture is sand or fine sand. Some pedons have mottles or splotches of gray or white in the lower part of the C horizon. These are not indicative of wetness but are pockets of uncoated sand grains.

Basinger Series

The Basinger series consists of deep, nearly level, poorly drained, very rapidly permeable soils that formed in sandy marine deposits. These soils are in poorly defined drainageways, depressions, and sloughs on the flatwoods. The slopes are 2 percent or less. Basinger soils are siliceous, hyperthermic Spodic Psammaquents.

Basinger soils are associated with EauGallie, Immokalee, Myakka, and Pompano soils. EauGallie, Immokalee, and Myakka soils have a continuous Bh horizon. Pompano soils do not have a continuous or discontinuous Bh horizon.

Typical pedon of Basinger fine sand; in a wooded area, about 0.25 of a mile north of Citrus County Road 470, 2 miles east of Citrus County Road 581, SE1/4NE1/4 sec. 3, T. 19 S., R. 20 E.

A—0 to 3 inches; black (N 2/0) fine sand; weak medium granular structure; very friable; many fine and medium roots; many uncoated light gray sand grains; extremely acid; clear wavy boundary.

E—3 to 8 inches; light gray (10YR 7/2) fine sand; single grained; loose; many fine and medium roots; few fine faint dark gray stains along root channels; very strongly acid; clear wavy boundary.

E/Bh—8 to 24 inches; light brownish gray (10YR 6/2) fine sand; common medium distinct discontinuous lenses and streaks of dark brown (10YR 3/3) fine sand, common medium distinct dark reddish brown (5YR 3/4) dark brown (7.5YR 3/2) weakly cemented Bh fragments; single grained; loose; few fine and medium roots; many sand grains with thin coating of colloidal organic material in lenses, streaks, and Bh fragments; uncoated light brownish gray sand grains in E part; strongly acid; gradual wavy boundary.

C1—24 to 40 inches; light gray (10YR 7/2) fine sand; single grained; loose; few fine and medium roots; common medium distinct dark grayish brown (10YR 4/2) stains along root channels; strongly acid; gradual wavy boundary.

C2—40 to 80 inches; white (10YR 8/2) fine sand; single grained; loose; few fine roots; common medium distinct dark brown (10YR 4/3) stains along root channels; strongly acid.

Texture is sand or fine sand except in the A horizon. The A horizon is dominantly fine sand. Reaction ranges from extremely acid to neutral.

The A horizon has hue of 10YR or 2.5Y, value of 2 to 6, and chroma of 1 or 2; or it is neutral and has value of 2 to 4. Depressional areas can have a thin muck surface layer that is less than 6 inches thick. The A horizon is 2 to 7 inches thick.

The E horizon has hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 1 to 3; or it is neutral and has value of 5 to 8. The E horizon is 5 to 19 inches thick.

The E part of the E/Bh horizon has color similar to that of the E horizon. The Bh part occurs as streaks, lenses, or weakly cemented bodies of fine sand and has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 to 4. Most sand grains in the Bh part are thinly coated with colloidal organic material. The sand grains in the E part are not coated. The E/Bh horizon is 8 to 20 inches thick. A few pedons have a Bh horizon in addition to, or in place of, the E/Bh horizon. This Bh horizon has the same range in colors as the Bh part of the E/Bh horizon.

The C horizon extends to a depth of 80 inches or more. It has hue of 10YR, 2.5Y, or 5Y, value of 5 to 8, and chroma of 1 or 2; or value of 4 to 6, and chroma of 3; or it is neutral and has value of 5 to 8.

Many pedons have mottles in shades of gray, yellow, or brown in the E/Bh and C horizons.

Boca Series

The Boca series consists of moderately deep, nearly level, poorly drained, moderately permeable soils that formed in sandy and loamy marine deposits underlain by limestone bedrock. These soils are in low, broad areas and in poorly defined drainageways on the flatwoods. The slopes are smooth and are less than 2 percent. Boca soils are loamy, siliceous, hyperthermic Arenic Ochraqualfs.

Boca soils are associated with Basinger, Broward, EauGallie, and Myakka soils. Basinger soils have a discontinuous Bh horizon. Broward soils are similar to Boca soils but do not have a Bt horizon. In addition, these soils are somewhat poorly drained. EauGallie and Myakka soils have a continuous Bh horizon.

Typical pedon of Boca fine sand; in a wooded area, 2.5 miles west of U.S. Highway 19, 1.1 miles north of Cross Florida Barge Canal, SE1/4SE1/4 sec. 5, T. 17 S., R. 16 E.

A—0 to 5 inches; dark grayish brown (10YR 4/2) fine sand; single grained; loose; many fine roots; strongly acid; abrupt wavy boundary.

E—5 to 19 inches; light gray (10YR 7/1) fine sand; single grained; loose; strongly acid; abrupt wavy boundary.

EB—19 to 21 inches; yellow (10YR 7/8) fine sand; single grained; loose; slightly acid; abrupt wavy boundary.

Btg—21 to 38 inches; grayish brown (10YR 5/2) sandy clay loam; common fine and medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; moderately alkaline; abrupt irregular boundary.

2R—38 inches; hard limestone.

The thickness of the solum and the depth to limestone bedrock range from 24 to 40 inches except in solution pits within the pedon where the depth to limestone bedrock ranges from 24 to 50 inches or more. Depth to the argillic horizon ranges from 20 to 38 inches in more than half of the pedon; in solution pits, the depth to the argillic horizon ranges from 20 inches to more than 40 inches. Reaction ranges from strongly acid to moderately alkaline.

The A or Ap horizon has hue of 10YR or 2.5YR, value of 2 to 5, and chroma of 1 or 2; or it is neutral and has value of 2 to 5. Texture is sand or fine sand. The A horizon is 3 to 9 inches thick. An A horizon that has color value of less than 3.5 is less than 6 inches thick.

The E horizon has hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 1 to 4; or it is neutral and has value of 5 to 7. Texture is dominantly fine sand. The E horizon is 7 to 22 inches thick.

Some pedons have an EB horizon that has hue of 10YR, value of 3 to 7, and chroma of 2 to 8. Texture is sand, fine sand, or loamy fine sand. In some pedons, brown, yellow, or gray mottles are in the EB horizon. The EB horizon is less than 6 inches thick.

The Btg horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2; or it is neutral and has value of 4 to 6. Texture is sandy loam, fine sandy loam, or sandy clay loam that has pockets and lenses of sand or loamy sand. In some pedons, gray, yellow, or brown mottles are in the Btg horizon. In some pedons, this horizon is calcareous. The Btg horizon is 4 to 20 inches thick. Many pedons have a 1 to 3 inch thick layer of mixed weathered and soft limestone fragments, carbonate masses, sandy clay loam, or sandy loam between the Btg horizon and the limestone bedrock.

The 2R horizon is hard limestone bedrock.

Broward Series

The Broward series consists of moderately deep, nearly level, somewhat poorly drained, rapidly permeable soils that formed in sandy marine deposits underlain by limestone bedrock. These soils are on broad flatwoods near the coast. The slopes range from 0 to 2 percent. Broward soils are hyperthermic, uncoated Aquic Quartzipsamments.

Broward soils are associated with Adamsville, Boca, Hallandale, Pompano, and Tavares soils. Adamsville, Pompano, and Tavares soils do not have limestone bedrock within 80 inches of the surface. In addition, Pompano soils are poorly drained, and Tavares soils are moderately well drained. Hallandale soils have limestone bedrock within 20 inches of the surface. These soils are poorly drained. Boca soils are similar to Broward soils but have a Bt horizon underlain by limestone. These soils are poorly drained.

Typical pedon of Broward fine sand; in a cleared area, 1 mile north of Cross Florida Barge Canal, 1.1 miles west of U.S. Highway 19, SE1/4SE1/4 sec. 4, T 17 S., R. 16 S.

A—0 to 5 inches; very dark gray (10YR 3/1) fine sand, rubbed; weak medium granular structure; very friable; few fine and medium roots; mixed white (10YR 8/1) sand grains and finely divided organic material, unrubbed; medium acid; abrupt wavy boundary.

C1—5 to 15 inches; gray (10YR 5/1) fine sand; single grained; loose; few fine and medium roots; medium acid; gradual wavy boundary.

C2—15 to 35 inches; brownish yellow (10YR 6/6) fine sand; single grained; loose; medium acid; abrupt irregular boundary.

2R—35 inches; hard white (10YR 8/1) limestone with solution holes and fractures.

The depth to limestone bedrock ranges from 20 to 40 inches. Solution cavities that extend to a depth of 60 inches or more are in many pedons. The content of silt and clay in the control section is less than 5 percent. Reaction ranges from medium acid to moderately alkaline.

The A horizon has hue of 10YR, value of 2 to 5, and chroma of 1 or 2. Texture is dominantly fine sand. The A horizon is 3 to 8 inches thick.

In many pedons, the upper part of the C horizon has hue of 10YR, value of 5 to 8, and chroma of 1 or 2. The lower part of the C horizon dominantly has hue of 10YR, value of 5 to 8, and chroma of 3 to 6. If present, mottles are gray, brown, yellow, or red. In some pedons, the upper part of the C horizon has chroma of 3 or more, and the lower part has chroma of 2 or less. Matrix colors are the results of uncoated sand grains or thin coatings of organic matter on the sand grains. Texture is sand or fine sand. In some pedons, a thin, discontinuous layer of calcium carbonate is on the surface of the limestone.

The 2R horizon is hard limestone bedrock.

Candler Series

The Candler series consists of deep, nearly level to strongly sloping, excessively drained, permeable soils that formed in unconcolidated sandy marine, eolian, and fluvial deposits. These soils are on the upland ridges. The landscape is somewhat undulating. The slopes are smooth to concave and range from 0 to about 12 percent. Candler soils are hyperthermic, uncoated Typic Quartzipsamments.

Candler soils are associated with Adamsville, Apopka, Arredondo, Astatula, Lake, Sparr, and Tavares soils. The associated soils do not have lamellae. Adamsville soils are somewhat poorly drained, and Tavares soils are moderately well drained. Apopka, Arredondo, and Sparr soils have a Bt horizon. In addition, Apopka and Arredondo soils are well drained, and Sparr soils are somewhat poorly drained. Lake soils have more than 5 percent silt and clay between depths of 10 and 40 inches.

Typical pedon of Candler fine sand, 0 to 5 percent slopes; in a wooded area, 100 feet north of a trail, 3.5 miles north of Citrus County Road 491, 4 miles west of U.S. Highway 41, SE1/4NE1/4 sec. 1, T. 18 S., R. 18 E.

A—0 to 4 inches; dark grayish brown (10YR 4/2) fine sand; single grained; loose; many fine and medium roots; mixed uncoated sand grains and finely divided organic material, unrubbed; strongly acid; clear wavy boundary.

E1—4 to 14 inches; very pale brown (10YR 7/3) fine sand; single grained; loose; few medium roots; very strongly acid; gradual wavy boundary.

E2—14 to 35 inches; very pale brown (10YR 7/4) fine sand; single grained; loose; few medium roots; strongly acid; gradual wavy boundary.

E3—35 to 52 inches; light yellowish brown (10YR 6/4) fine sand; single grained; loose; few medium roots; few scattered brownish yellow (10YR 6/8) splotches; strongly acid; gradual wavy boundary.

E4—52 to 72 inches; very pale brown (10YR 8/4) fine sand; single grained; loose; few medium distinct yellow (10YR 7/6) splotches about 2 centimeters in diameter; strongly acid; gradual wavy boundary.

E/Bt—72 to 80 inches; very pale brown (10YR 8/4) fine sand; loose; scattered yellowish brown (10YR 5/6) loamy fine sand lamellae about 3 to 8 millimeters thick and 1 to 15 centimeters long; lamellae concentration increases with depth; strongly acid.

The solum is 80 inches or more thick. Lamellae that range from 1 to 9 millimeters in thickness are at a depth of 40 to 75 inches. Reaction is very strongly acid to medium acid. The content of silt and clay is less than 5 percent, and the content of very fine sand is less than 20 percent between depths of 10 and 40 inches.

The A or Ap horizon has hue of 10YR, value of 2 to 5, and chroma of 1 to 3. Texture is sand or fine sand. The A horizon is 2 to 8 inches thick.

The E horizon has hue of 10YR, value of 5 to 8, and chroma of 3 to 8. Texture is sand or fine sand. Mottles and splotches that have chroma of 2 or less are in the E horizon. These colors are the result of uncoated sand grains in the horizon and are not indicative of wetness. The E horizon extends to a depth of 40 to 75 inches.

The E/Bt horizon extends to a depth of 80 inches or more. The E part of the E/Bt horizon has hue of 10YR, value of 5 to 8, and chroma of 4 to 8. Texture is sand or fine sand. The Bt part of the E/Bt horizon has hue of 5YR, 7.5YR, or 10YR, value of 5 or 6, and chroma of 6 to 8. Texture is fine sand to sandy loam. The individual lamellae range from 1 to 3 millimeters thick. The combined thickness of the lamellae within 80 inches of the surface layer is dominately 5 to 12 millimeters but ranges from 1 to 55 millimeters.

Citronelle Series

The Citronelle series consist of shallow, nearly level, somewhat poorly drained, moderately permeable to moderately rapidly permeable soils that formed in sandy marine deposits underlain by limestone bedrock. These soils are on the flatwoods. The slopes are less than 2 percent. Citronelle soils are hyperthermic coated Lithic Quartzipsamments.

Citronelle soils are associated with Adamsville, Basinger, Boca, Broward, Hallandale, Pompano, and Redlevel soils. Adamsville, Basinger, Boca, Broward, Pompano, and Redlevel soils are deeper to limestone bedrock than Citronelle soils. In addition, Basinger, Boca, and Pompano soils are poorly drained. Hallandale soils are similar to Citronelle soils but are poorly drained.

Typical pedon of Citronelle fine sand; in a forested area, about 1.3 miles north of intersection of U.S. Highway 19 and Citrus County Road 495, 0.3 of a mile west of Citrus County Road 495, SE1/4SW1/4 sec 9, T. 18 S., R. 17 E.

A—0 to 2 inches; dark yellowish brown (10YR 4/4) fine sand, weak medium granular structure; very friable; few fine and medium roots; very strongly acid; gradual wavy boundary.

Bw—2 to 9 inches; yellowish red (5YR 5/8) fine sand; weak medium granular structure; very friable; few fine and medium roots; strongly acid; gradual wavy boundary.

2R—9 inches; hard limestone bedrock.

The thickness of the solum and the depth to limestone bedrock range from 5 to 20 inches except in pedons that have solution holes. The solution holes make up less than 20 percent of any pedon, and they can extend to a depth of 50 inches.

The A horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 3 to 6. Texture is dominantly fine sand. The A horizon ranges from 1 inch to 6 inches in thickness. Reaction is strongly acid to moderately alkaline.

The Bw horizon has hue of 5YR or 7.5YR, value of 4 to 6, and chroma of 4 to 8. Texture is sand or fine sand. The Bw horizon is 2 to 14 inches thick. Reaction is strongly acid to moderately alkaline. In some pedons, up to 35 percent limestone fragments, 2 to 10 millimeters in size, are in the lower 2 inches of the Bw horizon.

The 2R horizon is hard limestone bedrock.

Durbin Series

The Durbin series consists of deep, nearly level, very poorly drained, rapidly permeable soils that formed in well decomposed sapric material. These organic soils contain sulfur. They are in broad tidal marsh areas. The slopes are less than 1 percent. These soils are flooded daily during normal high tides. Durbin soils are euic, hyperthermic Typic Sulfihemists.

Durbin soils are associated with Homosassa, Lacoochee, and Weekiwachee soils. Homosassa and Lacoochee soils are mineral soils. Weekiwachee soils are organic soils but have limestone at a depth of less than 80 inches.

Typical pedon of Durbin muck, in an area of Weekiwachee-Durbin mucks; in a coastal marsh, 50 feet east of boat ramp on Fort Island, NW1/4NW1/4 sec. 16, T. 17 S., R. 16 E.

Oa1—0 to 7 inches; very dark gray (10YR 3/1) muck; about 25 percent fiber, unrubbed, and less than 5 percent fiber, rubbed; massive; sticky; many fine and medium roots; slight odor of sulfur when freshly exposed; neutral in water at field moisture (air-dry pH 5.0 in 0.01 molar calcium chloride); gradual wavy boundary.

Oa2—7 to 25 inches; black (10YR 2/1) muck; about 20 percent fiber, unrubbed, and less than 5 percent fiber, rubbed; massive; sticky; common fine and medium roots; strong odor of sulfur when freshly exposed; few scattered pockets of dark brown (10YR 3/3) fiberous material resistant to destruction by rubbing; neutral in water at field moisture (air dry pH 4.7 in 0.01 molar calcium chloride); gradual wavy boundary.

Oa3—25 to 80 inches; black (10YR 2/1) muck; less than 5 percent fiber, rubbed and unrubbed; massive; very sticky; about 40 percent mineral content; few pockets and streaks of dark brown (10YR 3/3) fine sand; strong odor of sulfur when freshly exposed; neutral in water at field moisture (air dry pH 4.7 in 0.01 molar calcium chloride).

In the Oa horizon, the content of sulfur ranges from 0.75 to 4 percent or more. Saturated paste extract conductivity is more than 16 millimhos per centimeter. Reaction in water is slightly acid or neutral in the natural state; after air drying, the pH ranges from 3.6 to 5.5 when 0.01 molar calcium chloride is used.

Pieces of wood and small masses of fiberous material that are resistant to destruction by rubbing range from 2 to 20 percent. The thickness of the Oa horizon ranges from 55 to 80 inches. If the Oa horizon is less than 80 inches thick, it is underlain by a sandy layer.

The Oa horizon has hue of 5YR or 10YR, value of 2 or 3, and chroma of 1 or 2; or it is neutral and has value of 2 or 3. The content of unrubbed fiber is about 30 percent or less, and the content of rubbed fiber is less than 5 percent. The Oa horizon is more than 51 inches thick.

Some pedons have a 2C horizon that extends to a depth of more than 80 inches. It has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2. Texture is sand or fine sand.

EauGallie Series

The EauGallie series consists of deep, nearly level, poorly drained and very poorly drained, moderately permeable soils that formed in sandy and loamy marine deposits. These soils are in broad areas on the flatwoods. The slopes are smooth and range from 0 to 2 percent. EauGallie soils are sandy, siliceous, hyperthermic Alfic Haplaquods (fig .8).

EauGallie soils are associated with Basinger, Immokalee, and Myakka soils. Basinger soils do not have a continuous Bh horizon. Immokalee and Myakka soils do not have a Btg horizon.

Typical pedon of EauGallie fine sand; in a pasture, 1 mile west of U.S. Highway 19, 50 feet north of a trail road, NW1/4SW1/4 sec. 24, T. 20 S., R. 17 E.

A1—0 to 3 inches; very dark gray (10YR 3/1) fine sand; weak fine granular structure; very friable; many fine roots; very strongly acid; gradual wavy boundary.

A2—3 to 10 inches; dark gray (10YR 4/1) fine sand; single grained; loose; many fine and medium roots; very strongly acid; gradual wavy boundary.

E—10 to 22 inches; light brownish gray (10YR 6/2) fine sand; single grained; loose; few medium roots; very dark grayish brown streaks along root channels; very strongly acid; abrupt wavy boundary.

Bh1—22 to 45 inches; dark brown (7.5YR 3/2) fine sand; massive, parting to weak medium subangular blocky structure; friable; few fine roots; sand grains well coated with organic material; extremely acid; gradual wavy boundary.

Bh2—45 to 53 inches; dark reddish brown (5YR 3/3) fine sand; weak fine granular structure; friable, few fine roots; pockets of loose and single grained sand; sand grains coated with organic material; very strongly acid; abrupt smooth boundary.

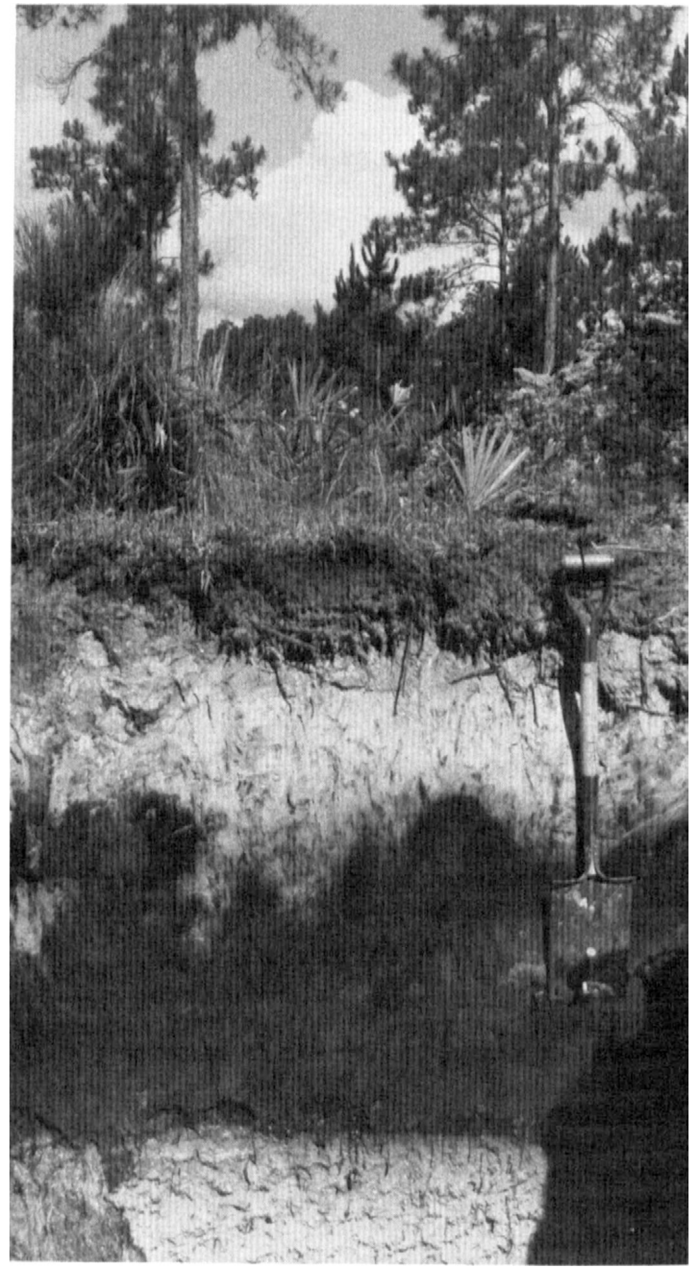


Figure 8.— In this profile of EauGallie fine sand, the dark Bh horizon is at a depth of about 22 inches, and the light Bt horizon is at a depth of about 53 inches.

Btg1—53 to 68 inches; pale olive (5Y 6/3) fine sandy loam; very friable; few fine roots; sand grains coated with clay; few scattered uncoated sand grains; very strongly acid; diffuse wavy boundary.

Btg2—68 to 80 inches; light gray (5Y 7/1) fine sandy loam; weak medium subangular blocky structure; friable; few fine roots; sand grains coated and bridged with clay; scattered pockets of sand; very strongly acid.

The solum is from 60 to 80 inches thick. Depth to the Bh horizon ranges from 20 to 30 inches, and depth to the Btg horizon is more than 40 inches. Depth to hard limestone bedrock is more than 50 inches.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. Reaction ranges from very strongly acid to medium acid. Texture is sand or fine sand. The thickness of the A horizon is 3 to 7 inches.

The E horizon has hue of 10YR, value of 5 to 8, and chroma of 1 or 2. Texture is sand or fine sand. Reaction ranges from very strongly acid to medium acid. The E horizon is 17 to 25 inches thick.

The Bh horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 to 3; or it is neutral and has value of 3. Sand grains are coated with organic matter. Reaction ranges from extremely acid to slightly acid. Texture is sand or fine sand. The Bh horizon is 7 to 20 inches thick.

Some pedons have an E' horizon below the Bh horizon. The E' horizon has hue of 10YR to 2.5Y, value of 4 to 6, and chroma of 1 to 3. Reaction is very strongly acid to slightly acid. Texture is sand or fine sand. The E' horizon is less than 8 inches thick.

The Btg horizon extends to a depth of 50 inches or more. It has hue of 10YR to 5Y, value of 4 to 7, and chroma of 3 or less. Texture is sandy loam, fine sandy loam or sandy clay loam. Lenses and pockets of sand range from none to common. The content of clay averages 16 to 23 percent but ranges from 23 to 35 percent. Reaction ranges from very strongly acid to mildly alkaline.

Some pedons have a R horizon in limestone substratum phases of EauGallie soils. The R horizon is hard limestone bedrock that is at a depth of 50 to 80 inches.

The EauGallie soils are taxadjuncts to the EauGallie series because the Bh horizon is more acid than is typical for the series. These soils are similar in use, management, and behavior to the soils of the EauGallie series.

Fort Meade Series

The Fort Meade series consists of deep, nearly level to gently sloping, well drained, rapidly permeable soils that formed in sandy marine deposits underlain by or mixed with phosphatic material. These soils are on upland ridges. The slopes are smooth to concave and range from 0 to 5 percent. Fort Meade soils are sandy, siliceous, hyperthermic Quartzipsammentic Haplumbrepts.

Fort Meade soils are associated with Arredondo, Candler, Lake, Paola, and Tavares soils. The associated soils do not have a loamy sand texture throughout nor do they have an umbric or mollic epipedon. In addition, Arredondo soils have a Bt horizon. Candler, Lake, and Paola soils are excessively drained, and Tavares soils are moderately well drained.

Typical pedon of Fort Meade loamy fine sand, 0 to 5 percent slopes; from a vacant area of a housing development, about 400 feet north of a dirt road, 2 miles east of Citrus County Road 491, 1 mile north of Citrus County Road 484, SW1/4NE/4 sec. 18, T. 18 S., R. 19 E.

A—0 to 13 inches; black (10YR 2/1) loamy fine sand; moderate medium granular structure; very friable; many fine and few coarse roots; strongly acid; gradual wavy boundary.

C1—13 to 34 inches; dark yellowish brown (10YR 4/4) loamy fine sand; weak fine granular structure; very friable; common fine and few medium roots; medium acid; gradual wavy boundary.

C2—34 to 56 inches; dark brown (7.5YR 4/4) loamy fine sand; weak medium subangular blocky structure parting to moderate medium granular structure when disturbed; very friable; several very dark grayish brown (10YR 3/2) horizontal and vertical krotovinas about 2 inches in diameter; few scattered carbon fragments; medium acid; gradual wavy boundary.

C3—56 to 80 inches; strong brown (7.5YR 5/6) loamy fine sand; weak medium subangular blocky structure parting to moderate medium granular structure when disturbed; very friable; few scattered carbon fragments; medium acid.

Loamy sand or loamy fine sand extends to a depth of 80 inches or more. Reaction ranges from strongly acid to neutral in the A horizon and from very strongly acid to medium acid in the C horizon. Pebbles of phosphate rock or concretions enriched with phosphate can occur at a depth of 65 inches. In some pedons, the content of these pebbles is less than 5 percent, by volume, and the pebbles generally are less than 1 inch.

The A horizon has hue of 10YR or 7.5YR, value of 2 or 3, and chroma of 1 to 3. This horizon is dominantly 11 to 20 inches thick but ranges from 20 to more than 30 inches in thickness.

The C horizon extends to a depth of 80 inches or more. It has hue of 5YR to 10YR, value of 4 to 8, and chroma of 3 to 8.

Hallandale Series

The Hallandale series consists of shallow, nearly level, poorly drained, moderately permeable to moderately rapidly permeable soils that formed in sandy and loamy marine deposits underlain by limestone bedrock. These soils are along the coast adjacent to freshwater and saltwater marshes and also on some offshore islands. The slopes are less than 2 percent. Hallandale soils are siliceous, hyperthermic Lithic Psammaquents.

Hallandale soils are associated with Basinger, Boca, and Pompano soils. Basinger and Pompano soils do not have limestone bedrock within 80 inches of the surface. Boca soils have a Bt horizon and limestone bedrock at a depth of more than 20 inches.

Typical pedon of Hallandale fine sand, in an area of Hallandale-Rock outcrop complex, rarely flooded; in a forested area, about 500 feet west of Citrus County Road 494, 30 feet east of a trail, NW1/4SW1/4 sec. 10, T. 19 S., R. 16 E.

A—0 to 2 inches; black (10YR 2/1) fine sand; weak medium granular structure; very friable; many fine and medium roots; strongly acid; clear smooth boundary.

E—2 to 6 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; few fine and medium roots; medium acid; gradual wavy boundary.

Bw1—6 to 8 inches; brown (10YR 5/3) fine sand; single grained; loose; cyclic horizon, up to 8 inches before being interrupted; slightly acid; abrupt irregular boundary.

Bw2—8 to 10 inches; yellowish brown (10YR 5/6) fine sand; common medium distinct grayish brown (10YR 5/2) mottles; slight increase in clay; common sand-size limestone fragments; neutral; abrupt irregular boundary.

R—10 inches; hard, fractured limestone boulders with solution holes of yellowish brown (10YR 5/6) sandy clay loam Bt material and soft limestone.

The thickness of the solum commonly ranges from 7 to 20 inches except in pedons that have solution holes. The solution holes make up less than 20 percent of any pedon, extend to a depth of 50 or more inches, and contain a discontinuous Bt horizon.

The A horizon has hue of 10YR, value of 2 to 6, chroma of 1; or it is neutral and has value of 2 to 6. Texture is dominantly find sand. The horizon is a mixture of finely divided organic material and light gray (10YR 7/1) sand grains, unrubbed. The thickness of the A horizon ranges from 2 to 7 inches. Reaction ranges from strongly acid to slightly acid.

Some pedons have an E horizon that has hue of 10YR, value of 4 to 7, and chroma of 1 or 2; or it is neutral and has value of 4 to 7. The thickness of the E horizon is less than 8 inches. Texture is sand or fine sand. The E horizon ranges from strongly acid to slightly acid.

Some pedons have a Bw horizon that extends to a maximum depth of 20 inches. It has hue of 10YR, value of 4 to 7, and chroma of 3 to 6. Mottles of yellow and gray are in the Bw horizon of some pedons. Texture is sand or fine sand. Reaction ranges from slightly acid to moderately alkaline.

Some pedons have a C horizon that has hue of 10YR, value of 4 to 8, and chroma of 1 to 4. Texture is sand or fine sand. Reaction ranges from slightly acid to moderately alkaline.

The R horizon is hard limestone bedrock.

Homosassa Series

The Homosassa series consists of moderately deep, nearly level, very poorly drained, rapidly permeable to very rapidly permeable soils that formed in sandy marine deposits. These soils are in tidal marshes along the west coast of the county. They are subject to tidal floodings. The slopes are less than 1 percent. Homosassa soils are sandy, siliceous, hyperthermic Typic Sulfaquents.

Homosassa soils are associated with Durbin, Lacoochee, and Weekiwachee soils. Lacoochee soils do not have a thick, dark A horizon, and they have a Cr horizon within 20 inches of the surface. Durbin and Weekiwachee soils are organic soils.

Typical pedon of Homosassa mucky fine sandy loam; in a salt marsh near Dixie Bay, approximately 1 mile west of Florida State Highway 44, SE1/4NW1/4 sec. 30, T. 18 S., R. 17 E.

A1—0 to 4 inches; very dark gray (10YR 3/1) mucky fine sandy loam; weak medium granular structure; very friable; slightly sticky; many fine roots; neutral; clear smooth boundary.

A2—4 to 10 inches; very dark gray (10YR 3/1) mucky fine sandy loam; few medium distinct dark grayish brown (10YR 4/2) mottles; moderate medium granular structure; very friable; many fine roots; neutral; gradual wavy boundary.

A3—10 to 18 inches; very dark grayish brown (10YR 3/2) loamy fine sand; common medium distinct grayish brown (10YR 5/2) mottles; weak medium granular structure; very friable; common fine roots; neutral; gradual wavy boundary.

C—18 to 31 inches; grayish brown (10YR 5/2) loamy fine sand; common medium distinct very dark gray (10YR 3/1) mottles; massive; very friable; few fine roots; neutral; gradual wavy boundary.

Cr—31 to 35 inches; light gray (10YR 7/1) soft limestone; massive; firm; about 35 percent hard limestone fragments; moderately alkaline; calcareous; abrupt irregular boundary.

R—35 inches; hard limestone (can be chipped but not dug with a spade).

The combined thickness of the A and C horizons is 20 to 35 inches. The content of sulfur is more than 0.75 percent within 20 inches of the surface. Depth to limestone bedrock ranges from 23 to 40 inches.

The A horizon has hue of 10YR or 2.5Y, value of 3 or less, and chroma of 2 or less. The content of organic matter in the upper part of the A horizon is more than 10 percent; and in the lower part of the A horizon, it ranges from 5 to 10 percent. The content of sulfur in the A horizon is less than 0.75 percent, and the *n* value is more than 2. Reaction before drying is neutral or mildly alkaline; after drying, it ranges from very strongly acid to medium acid. Texture in the upper part of the A horizon is mucky fine sandy loam; and in the lower part, it is loamy fine sand or fine sand. The thickness of the A horizon ranges from 10 to 20 inches.

The C horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 2 or less. If mottles are in the C horizon, they are in shades of gray, yellow, or red. Texture is fine sand or loamy fine sand. The content of organic matter is less than 5 percent. The content of sulfur is more than 0.75 percent, and the *n* value ranges from 0.7 to 2.0. Reaction ranges from slightly acid to mildly alkaline; after drying, it ranges from extremely acid to medium acid. The thickness of the C horizon ranges from 4 to 15 inches.

The Cr horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2. Hard limestone fragments occur randomly throughout the horizon and make up about 20 to 35 percent of the volume. Solution holes are in some pedons. These holes are filled with loamy fine sand and hard limestone fragments. The thickness of the Cr horizon is less than 10 inches.

The R horizon is hard limestone bedrock.

Immokalee Series

The Immokalee series consists of deep, nearly level, poorly drained, moderately permeable soils that formed in sandy marine deposits. These soils are on the broad flatwoods. The slopes are 2 percent or less. Immokalee soils are sandy, siliceous, hyperthermic Arenic Haplaquods.

Immokalee soils are associated with Basinger, EauGallie, Myakka, and Pompano soils. Basinger soils do not have a continuous Bh horizon. EauGallie and Myakka soils have a continuous Bh horizon at a depth of less than 30 inches. EauGallie soils have a Bt horizon. Pompano soils do not have a Bh horizon.

Typical pedon of Immokalee fine sand; in a wooded area, 2 miles south of Florida State Highway 44, 6 miles east of U.S. Highway 41 in the Grand Prairie, SE1/4SW1/4 sec. 21, T. 19 S., R. 21 E.

A1—0 to 6 inches; black (N 2/0) crushed fine sand; weak fine granular structure; very friable; many fine and medium roots, very strongly acid; clear wavy boundary.

E—6 to 33 inches; light brownish gray (10YR 6/2) fine sand; single grained; loose; many fine and medium roots; very strongly acid; clear irregular boundary.

Bh1—33 to 38 inches; very dark grayish brown (10YR 3/2) fine sand; single grained; loose; few fine roots; sand grains well coated with colloidal organic material; very strongly acid; gradual wavy boundary.

Bh2—38 to 42 inches; dark reddish brown (5YR 3/3) fine sand; single grained; loose; few fine and medium roots; scattered parts weakly cemented with a weak fine granular structure; many sand grains well coated with colloidal organic material; few to common uncoated sand grains; very strongly acid; gradual wavy boundary.

Bh3—42 to 52 inches; dark reddish brown (5YR 3/3) fine sand; single grained; loose; many sand grains moderately well coated with colloidal organic material; common uncoated sand grains mixed throughout; few scattered pockets of uncoated sand grains; very strongly acid; clear wavy boundary.

C1—52 to 65 inches; light brownish gray (10YR 6/2) fine sand; common medium faint mottles of dark yellowish brown (10YR 4/4); single grained; loose; very strongly acid; gradual wavy boundary.

C2—65 to 80 inches; light gray (10YR 7/2) fine sand; single grained; loose; some scattered compact areas, loose when crushed; strongly acid.

Texture is fine sand or sand except in the A horizon. The A horizon is dominantly fine sand. Reaction ranges from extremely acid to medium acid. Depth to the Bh horizon ranges from 30 to 50 inches.

The A or Ap horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2; or it is neutral and has value of 2 to 4. The thickness of the A horizon is 4 to 9 inches.

The E horizon has hue of 10YR, value of 5 to 8, and chroma of 1 or 2; or it is neutral and has value of 5 to 8. The thickness of the E horizon ranges from 26 to 45 inches.

The Bh horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 to 3. Sand grains in this horizon are coated with colloidal organic materials. Uncoated sand grains are few to common. Some pedons have vertical or horizontal intrusions or pockets of light brownish gray fine sand in the Bh horizon. In some pedon, the Bh horizon is underlain by E' and B'h horizons. The E' and B'h horizons have characteristics similar to those of the E and Bh horizons.

Some pedons have a BC horizon that has hue of 7.5YR to 10YR, value of 3 to 5, and chroma of 2 to 4. The BC horizon is less than 15 inches thick.

The C horizon extends to a depth of 80 inches or more. It has hue of 10YR, value of 4 to 7, and chroma of 1 to 4.

Kanapaha Series

The Kanapaha series consists of deep, nearly level to gently sloping, poorly drained, moderately slowly permeable soils that formed in sandy and loamy marine deposits. These soils are in low areas on the upland ridges. The slopes are smooth to concave and range from 0 to 5 percent. Kanapaha soils are loamy, siliceous, hyperthermic Grossarenic Paleaquults.

Kanapaha soils are associated with Adamsville, Arredondo, Basinger, and Sparr soils. Adamsville and

Basinger soils are in similar positions on the landscape as Kanapaha soils but are sandy to a depth of 80 inches. In addition, Adamsville soils are somewhat poorly drained. Sparr soils are in slightly higher positions and are somewhat poorly drained. Arredondo soils are in higher positions and are well drained.

Typical pedon of Kanapaha fine sand, 0 to 5 percent slopes; in a wooded area, approximately 1 mile north of Inverness, 500 feet east of U.S. Highway 41; SE1/4SE1/4 sec. 1, T. 19 S., R. 19 E.

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

E1—6 to 13 inches; light brownish gray (10YR 6/2) fine sand; few fine faint very dark gray mottles; single grained; loose; many fine and medium roots; strongly acid; clear wavy boundary.

E2—13 to 45 inches; light gray (10YR 7/1) fine sand; loose; few fine roots; strongly acid; gradual wavy boundary.

Btg—45 to 80 inches; light brownish gray (10YR 6/2) fine sandy loam, common medium distinct yellowish brown (10YR 5/4, 5/6) mottles; weak medium subangular blocky structure; friable; strongly acid.

The solum is 60 inches or more thick. Depth to the Bt horizon is 40 to 72 inches. Reaction is very strongly acid or strongly acid. The content of plinthite, weathered phosphatic pebbles, and iron concretions ranges from 0 to 5 percent.

The A horizon has hue of 10YR, value of 3 to 6, and chroma of 1 or 2. Texture is fine sand. The thickness of the A1 or Ap horizon ranges from 4 to 8 inches.

The E horizon has hue of 10YR, value of 5 to 8, and chroma of 1 or 2. In some pedons, few to common yellowish brown, light yellowish brown, and dark grayish brown mottles and dark gray, grayish brown, or very dark gray streaks are in this horizon. Texture is fine sand. The combined thickness of the A and E horizons is 40 to 72 inches.

The Btg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2; or it is neutral and has value of 4 to 6. This horizon has few to many mottles in shades of red, yellow, and brown. Texture is fine sandy loam, sandy clay loam, or sandy clay. In some pedons, the Btg horizon is underlain by a BCg horizon of fine sandy loam or sandy clay loam. The BCg horizon has the same range in colors as the Btg horizon.

Kendrick Series

The Kendrick series consists of deep, well drained, nearly level to moderately sloping, slowly permeable to moderately slowly permeable soils that formed in sandy and loamy marine deposits influenced by phosphatic material. These soils are on the upland ridges. The slopes are smooth to concave and range from 0 to 8 percent. Kendrick soils are loamy, siliceous, hyperthermic Arenic Paleudults.

Kendrick soils are associated with Arredondo, Lochloosa, and Sparr soils. Arredondo and Sparr soils have a sandy epipedon that is more than 40 inches thick. In addition, Sparr soils are somewhat poorly drained. Lochloosa soils are similar to Kendrick soils but are somewhat poorly drained.

Typical pedon of Kendrick fine sand, 0 to 5 percent slopes; in a wooded area, about 1.5 miles north of Citrus County Road 491, NE1/4NE1/4 sec. 23, T. 18 S., R. 18 E.

A—0 to 4 inches; dark grayish brown (10YR 4/2) fine sand; weak medium granular structure; very friable; many fine and medium roots; very strongly acid; clear wavy boundary.

E1—4 to 11 inches; yellowish brown (10YR 5/4) fine sand; weak medium granular structure; very friable; many fine and medium roots; strongly acid; clear wavy boundary.

E2—11 to 23 inches; brownish yellow (10YR 6/8) fine sand; weak medium granular structure; very friable; many fine and medium roots; few streaks of white sand grains; few scattered carbon fragments; strongly acid; clear wavy boundary.

E3—23 to 28 inches; brownish yellow (10YR 6/6) fine sand; weak medium granular structure; very friable; many fine and medium roots; scattered white sand grains; few carbon fragments; strongly acid; clear wavy boundary.

Bt1—28 to 34 inches; yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; very friable; common fine and medium roots; sand grains coated and bridged with clay; very strongly acid; clear wavy boundary.

Bt2—34 to 45 inches; yellowish brown (10YR 5/6) sandy clay; common medium distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; common fine and medium roots; sand grains coated and bridged with clay; very strongly acid; clear wavy boundary.

Bt3—45 to 63 inches; strong brown (7.5YR 5/6) sandy clay; common medium distinct dark red (2.5YR 3/6) mottles and few medium distinct light gray (10YR 7/1) mottles; moderate medium subangular blocky structure; firm; few fine roots; sand grains bridged and coated with clay; very strongly acid; gradual wavy boundary.

BC—63 to 80 inches; mottled strong brown (7.5YR 5/6), dark red (2.5YR 3/6), and light gray (10YR 7/1) sandy clay loam; moderate medium subangular blocky structure; firm; few small scattered pockets of dark gray (10YR 4/1) sandy loam; very strongly acid.

The solum is 60 inches or more thick. Reaction is very strongly acid to strongly acid except where limed. In some pedons, weathered phosphatic pebbles and iron concretions, 1 inch or less in diameter, make up less than 3 percent, by volume, of the soils.

The A horizon has hue of 10YR value of 4 or 5, and chroma of 1 or 2. The A horizon is 4 to 9 inches thick. Texture is fine sand or loamy fine sand. The E horizon has hue of 10YR, value of 5 or 6, and chroma of 3 to 8. The E horizon is sand, fine sand, loamy sand, or loamy fine sand. The combined thickness of the A and E horizons ranges from 20 to 40 inches.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 8. The upper part of the Bt horizon is fine sandy loam or sandy clay loam, and the lower part is sandy clay loam or sandy clay. The weighted clay average of the upper 20 inches of the argillic horizon is less than 35 percent. The Bt horizon extends to a depth of 60 inches or more.

Some pedons have a BC horizon and a C horizon that have color similar to the Bt horizon, or they are mottled in varying shades of brown, yellow, red, and gray. The BC horizon is sandy clay loam or sandy loam. The C horizon is sandy loam, sandy clay loam, or sandy clay.

Lacoochee Series

The Lacoochee series consist of deep, nearly level, poorly drained, moderately permeable soils that formed in sandy and loamy marine deposits underlain by limestone bedrock. These soils are in low, broad tidal marsh areas. The water table fluctuates with the tide, and the soils are frequently flooded daily during high tides. The slopes are less than 1 percent. Lacoochee soils are siliceous, hyperthermic, shallow Spodic Psammaquents.

Lacoochee soils are associated with Homosassa and Weekiwachee soils. These soils do not have an Ak horizon. In addition, Homosassa soils have a dark A horizon that is more than 10 inches thick, and Weekiwachee soils have sapric material that is 16 to 36 inches thick. Lacoochee soils generally are on slightly higher elevations than the surrounding Homosassa or Weekiwachee soils.

Typical pedon of Lacoochee fine sandy loam, in an area of Rock outcrop- Homosassa-Lacoochee complex; on a tidal marsh near Fish Creek, about 3.2 miles west of Ozello, Florida, SE1/4NW1/4 sec. 17, T. 19 S., R. 16 E.

Ak—0 to 5 inches; light gray (10YR 7/1) fine sandy loam; weak medium subangular blocky structure; friable; few fine roots; few fine limestone fragments; moderately alkaline; gradual irregular boundary.

E—5 to 8 inches; grayish brown (2.5Y 5/2) loamy fine sand; few fine faint streaks of light gray and brownish yellow mottles; weak medium subangular blocky structure; friable; moderately alkaline; clear wavy boundary.

B—8 to 13 inches; yellowish brown (10YR 5/6) loamy fine sand; few fine faint light gray mottles; weak medium subangular blocky structure; very friable; mildly alkaline; abrupt irregular boundary.

2Cr—13 to 21 inches; white (10YR 8/1) soft limestone; massive; firm; moderately alkaline; abrupt irregular boundary.

2R—21 inches; hard, white limestone bedrock.

The solum is less than 20 inches thick. The content of limestone fragments ranges from 0 to 5 percent. The content of sulfur is less than 0.75 percent. Depth to the R horizon ranges from 20 to 40 inches.

The Ak horizon has hue of 10YR, value of 4 to 7, and chroma of 1; or it is neutral and has value of 4 to 7. The thickness of the Ak horizon is less than 10 inches. Texture is dominantly fine sandy loam. The content of calcium carbonates in this horizon is more than 15 percent and commonly more than 45 percent. Reaction is neutral or moderately alkaline.

The E horizon has hue of 2.5Y or 10YR, value of 4 to 6, and chroma of 2. Texture is loamy fine sand or fine sand. Reaction is neutral to moderately alkaline. The E horizon is 2 to 4 inches thick.

The Bw horizon has hue of 2.5Y or 10YR, value of 5 or 6, and chroma of 4 to 8. Texture is fine sand or loamy fine sand. Reaction ranges from neutral to moderately alkaline. The thickness of the Bw horizon ranges from 5 to 15 inches.

The 2Cr horizon has hue of 10YR, value of 7 or 8, and chroma of 1 or 2. Hard limestone fragments, about 20 to 35 percent, by volume, occur randomly throughout. Solution holes in this horizon range from none to common. These solution holes are filled with loamy fine sand and hard limestone fragments.

The 2R horizon is hard limestone bedrock.

Lake Series

The Lake series consists of deep, nearly level to moderately sloping, excessively drained, rapidly permeable to moderately rapidly permeable soils that formed in sandy marine, eolian, or fluvial deposits. These soils are on the sandy uplands. The slopes range from 0 to 8 percent. Lake soils are hyperthermic coated Typic Quartzipsamments.

Lake soils are associated with Apopka, Arredondo, Astatula, Candler, and Tavares soils. Apopka and Arredondo soils have a Bt horizon within 80 inches of the surface. In addition, these soils are well drained. Astatula and Candler soils have less than 5 percent silt and clay in the 10- to 40-inch control section. Tavares soils are in slightly lower positions on the landscape than Lake soils and are moderately well drained.

Typical pedon of Lake fine sand, 0 to 5 percent slope; in a cultivated field, about 2 miles east of Florida State Highway 44, 1 mile north of Citrus County Road 491, 800 feet west of entrance road, NE1/4NW1/4 sec. 34, T. 17 S., R. 19 E.

Ap—0 to 7 inches; dark brown (10YR 4/3) fine sand; single grained; loose; common fine roots; very strongly acid; gradual wavy boundary.

C1—7 to 27 inches; yellowish brown (10YR 5/4) fine sand; single grained; loose; few medium distinct brownish yellow (10YR 6/8) splotches; very dark grayish brown (10YR 3/2) streaks along root channels; very strongly acid; gradual wavy boundary.

C2—27 to 40 inches; yellowish brown (10YR 5/8) fine sand; single grained; loose; common medium faint yellowish brown (10YR 5/4) splotches; very strongly acid; gradual wavy boundary.

C3—40 to 80 inches; brownish yellow (10YR 6/8) fine sand; single grained; loose; very strongly acid.

The combined thickness of the A and C horizons is 80 inches or more. The content of silt and clay in the 10- to 40-inch control section is 5 to 12 percent. Most sand grains are thinly coated but well coated with silt and clay. Reaction is very strongly acid or strongly acid except where limed.

The A or Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 1 to 3. The thickness of the A or Ap horizon ranges from 3 to 8 inches. Texture is fine sand or clay.

The C horizon extends to a depth of 80 inches or more. It has hue of 2.5YR to 10YR, value of 4 to 6, and chroma of 3 to 8. Many sand grains are coated. A few uncoated sand grains are in this horizon. In some pedons, thin discontinuous lamellae are at a depth of more than 60 inches. Texture is fine sand.

Lauderhill Series

The Lauderhill series consists of moderately deep, nearly level, very poorly drained, rapidly permeable soils that formed in hydrophytic plant remains and mineral material underlain by limestone bedrock. These soils are in the freshwater marshes. The slopes are less than 2 percent. Lauderhill soils are euic, hyperthermic Lithic Medisaprists.

Lauderhill soils are associated with Okeelanta and Terra Ceia soils. Okeelanta and Terra Ceia soils are organic soils but do not have limestone bedrock within 80 inches of the surface.

Typical pedon of Lauderhill muck, in an area of Okeelanta-Lauderhill- Terra Ceia mucks; in a wooded area, 0.2 of a mile south of Citrus County Road 490 west, SE1/4SE1/4 sec. 32, T. 19 S., R. 17 E.

Oa1—0 to 9 inches; black (10YR 2/1) muck; about 10 percent fiber, unrubbed, and less than 5 percent fiber, rubbed; massive; very friable; many fine and medium roots; about 25 percent mineral content; sodium pyrophosphate extract dark brown (10YR 4/3); mildly alkaline; clear wavy boundary.

Oa2—9 to 26 inches; dark brown (7.5YR 3/2) muck; less than 5 percent fiber, unrubbed; massive; very friable; many fine and medium and few coarse roots; slightly sticky, fluidlike when squeezed in hand; about 30 percent mineral content; few scattered limestone nodules less than 10 centimeters in diameter; sodium pyrophosphate extract dark brown (10YR 4/3); mildly alkaline; abrupt wavy boundary.

2R—26 inches; hard white (10YR 8/1) limestone; upper surface smooth and rounded; common narrow fractures that extend downward; organic material, sand, silt, clay, or soft limestone fill fractures.

The thickness of the sapric material ranges from 16 to 36 inches. Depth to hard limestone bedrock ranges from 20 and 40 inches. Reaction of sapric material ranges from slightly acid to moderately alkaline using the Hellige-Truog test and ranges from medium acid to mildly alkaline when 0.01 molar calcium chloride is used. Mineral content ranges from 15 to 40 percent.

The Oa horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 to 3; or it is neutral and has value of 2. The content of unrubbed fiber ranges from 30 to less than 5 percent.

In some pedons, the 2C horizon is sand, loamy sand, or sandy loam and has hue of 10YR, value of 2 to 5, and chroma of 1. This horizon may contain carbonatic material; or in some pedons, the 2C horizon is a calcareous clay (marl) that has hue of 10YR, value of 5, 6, or 8, and chroma of 1. Fragments of hard limestone are in this clayey horizon. Pockets of organic material also are common in this horizon.

The 2R horizon is hard limestone bedrock.

Lochloosa Series

The Lochloosa series consists of deep, nearly level to gently sloping, somewhat poorly drained, moderately permeable soils that formed in sandy and loamy marine deposits. These soils are in gently undulating areas on the upland ridges. The slopes range from 0 to 5 percent. Lochloosa soils are loamy, siliceous, hyperthermic Aquic Arenic Paleudults.

Lochloosa soils are associated with Kendrick and Sparr soils. Kendrick soils are well drained and are in higher positions on the landscape than Lochloosa soils. Sparr soils are similar to Lochloosa soils but have a Bt horizon at a depth of more than 50 inches.

Typical pedon of Lochloosa fine sand, 0 to 5 percent slopes; in a cultivated field, 0.8 of a mile north of Florida State Highway 44, 0.6 of a mile east of Citrus County Road 491, SE1/4NE1/4 sec. 4, T. 19 S., R. 18 E.

OAp—0 to 8 inches; grayish brown (10YR 5/2) fine sand;

weak medium crumb structure; very friable; many fine roots; very strongly acid; gradual wavy boundary.

E1—8 to 17 inches; brown (10YR 5/3) fine sand; single grained; loose; many fine roots; strongly acid; gradual wavy boundary.

E2—17 to 27 inches; light yellowish brown (10YR 6/4) fine sand; few fine faint grayish brown mottles; single grained; loose; scattered areas that have weak medium granular structure; very friable; very strongly acid; abrupt wavy boundary.

Bt1—27 to 37 inches; light yellowish brown (10YR 6/4) fine sandy loam; common medium distinct yellowish red (5YR 4/6) mottles and common medium faint brown (7.5YR 5/2) mottles; weak medium subangular blocky structure; firm; many sand grains coated with colloidal clay; few scattered lens of sandy clay loam; scattered firm- to hard-plinthite or plinthite-like bodies, less than 5 percent, by volume; very strongly acid; gradual wavy boundary.

Bt2—37 to 48 inches; light brownish gray (10YR 6/2) sandy clay loam; common medium distinct yellowish red (5YR 4/6) mottles and common medium faint brown (7.5YR 5/2) mottles; moderate medium subangular blocky structure; firm; scattered firm- to hard-plinthite or plinthite-like bodies, about 3 percent, by volume; many sand grains well coated with colloidal clay; clay skins and bridges on broken faces of peds; very strongly acid; gradual wavy boundary.

BCg—48 to 63 inches; gray (5Y 6/1) clay; common medium distinct yellowish red (5YR 4/6) mottles and common medium faint brown (7.5YR 5/2) mottles; moderate medium subangular blocky structure; firm; scattered firm- to hard-plinthite or plinthite-like bodies, about 3 percent, by volume; many sand grains coated with colloidal clay; clay casts and bridges on broken faces of peds; few scattered hard white (10YR 8/1) pebbles about 5 millimeters in diameter; extremely acid; gradual wavy boundary.

Cg—63 to 80 inches; light gray (5Y 7/1) sandy clay loam; common medium distinct very pale brown (10YR 7/3) mottles; moderate medium subangular blocky structure; firm; many sand grains coated with colloidal clay; very strongly acid.

The solum is 60 inches or more thick. Reaction is extremely acid to strongly acid except where limed. The content of weathered phosphatic pebbles and ironstone nodules, 2 to 76 millimeters in diameter, is 0 to 5 percent, by volume. In some pedons, the Bt horizon contains up to 5 percent plinthite, by volume.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1; or value of 5, and chroma of 2; or it is neutral and has value of 4 or 5. Texture is fine sand or loamy fine sandy. The thickness of the A horizon is 5 to 9 inches.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 3 or 4. If present, mottles are brown, yellow, and gray. Texture is fine sand or loamy fine sand. The combined thickness of the A and E horizons ranges from 20 to 40 inches.

The Bt horizon has hue of 10YR, value of 5 to 7, chroma of 3 to 8. Texture is dominantly sandy clay loam, sandy loam, or fine sandy loam; but in some pedons, it is loamy sand, loamy fine sand, sandy loam, or fine sandy loam in the upper 5 inches. The Bt horizon extends to a depth of 40 inches or more.

The BCg horizon has hue of 10YR or 5Y, value of 5 to 6, and chroma of 1 or 2; or it is neutral and has value of 5 to 6. Texture is sandy loam, fine sandy loam, sandy clay loam, or clay. Some pedons have a Cg horizon below the BCg horizon. The Cg horizon has the same range of colors as the BCg horizon. Texture is sandy clay loam, sandy clay, or clay. If present, pockets and lenses are of a finer- or coarser-textured material. The content of clay in the upper 20 inches of the Btg horizon is 15 to 30 percent.

The Lochloosa soils are taxadjuncts to the Lochloosa series because they have a clay texture in the BCg horizon and have 2 percent more clay in the upper 20 inches of the Bt horizon than is typical for the series. These soils are similar in use, management, and behavior to the soils of the Lochloosa series.

Malabar Series

The Malabar series consists of deep, nearly level, poorly drained, slowly permeable soils that formed in loamy marine deposits. These soils are on the flatwoods in the eastern part of the county. The slopes are less than 2 percent. Malabar soils are loamy, siliceous, hyperthermic Grossarenic Ochraqualfs.

Malabar soils are associated with Basinger, EauGallie, Paisley, and Pineda soils. Basinger and EauGallie soils do not have a Bt horizon. Paisley soils have a Bt horizon within 10 inches of the surface. Pineda soils have a Bt horizon between depths of 20 and 40 inches.

Typical pedon of Malabar sand; in a wooded area, about 2.5 miles west of bridge over Withloochess River and Florida State Highway 44, 1 mile north of Florida State Highway 44, NE1/4SW1/4 sec. 1, T. 19 S., R. 20 E.

A—0 to 2 inches; very dark gray (10YR 3/1) fine sand; single grained; very friable; many fine and medium roots; medium acid; gradual wavy boundary.

E—2 to 15 inches; brown (10YR 5/3) fine sand; common medium faint yellowish brown (10YR 5/6) mottles; single grained; very friable; slightly acid; gradual wavy boundary.

Bw1—15 to 38 inches; brownish yellow (10YR 6/8) fine sand; few fine faint brownish yellow (10YR 6/6) mottles; single grained; loose; slightly acid; gradual wavy boundary.

Bw2—38 to 44 inches; light yellowish brown (10YR 6/4) fine sand; few fine distinct reddish yellow (10YR 7/8) mottles; single grained; loose; slightly acid; gradual wavy boundary.

Btg1—44 to 62 inches; gray (10YR 6/1) and light gray (10YR 7/1) sandy clay loam, few fine distinct brownish yellow (10YR 6/8) mottles; weak fine subangular blocky structure; friable; neutral; clean wavy boundary.

Btg2—62 to 80 inches; light gray (10YR 7/2) sandy clay loam; few medium distinct brownish yellow (10YR 6/8) mottles; weak fine subangular blocky structure; friable; mildly alkaline.

The thickness of the solum ranges from 48 to more than 80 inches. Reaction ranges from medium acid to moderately alkaline.

The A horizon has hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 1 or 2. Texture is sand or fine sand. The A horizon is 2 to 7 inches thick.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 2 to 4. Texture is sand or fine sand. The E horizon is 6 to 20 inches thick.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 8. Texture is sand or fine sand. The Bw horizon extends to a depth of 40 to 72 inches.

The Btg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2; or it is neutral and has value of 5 to 7. Texture is sandy clay loam. The Btg horizon extends to a depth of 80 inches.

Matlacha Series

The Matlacha series consists of deep, nearly level, somewhat poorly drained, moderately rapidly permeable to rapidly permeable man-made soils. These soils were formed by filling and earthmoving operations. The slopes are less than 2 percent. Matlacha soils are sandy, siliceous, hyperthermic Udalfic Arents.

Matlacha soils are associated with Basinger, EauGallie, Hallandale, Homosassa, Lauderhill, Lacoochee, Myakka, Okeelanta, Pompano, and Weekiwachee soils. Fill materials have not been placed over the surface of the associated soils.

Typical pedon of Matlacha loamy fine sand, in an area of Matlacha, limestone substratum-Urban land complex; in a vacant lot, 0.75 of a mile west of U.S. Highway 19 in the Kings Bay area, SW1/4NW1/4 sec. 21, T. 18 S., R. 17 E.

C1—0 to 6 inches; very dark grayish brown (10YR 3/2) gravelly fine sand; weak medium granular structure; very friable; many fine roots; about 20 percent, by volume, limestone fragments less than 3 inches in diameter; medium acid; abrupt wavy boundary.

C2—6 to 23 inches; mottled white (10YR 8/1), yellowish brown (10YR 5/6, 5/8) and brownish yellow (10YR 6/6, 6/8) gravelly fine sand; single grained; loose; many fine roots; about 25 percent, by volume, limestone fragments less than 3 inches in diameter; common scattered lumps of sandy clay loam and sandy loam; strongly acid; abrupt wavy boundary.

Ab—23 to 28 inches; very dark grayish brown (10YR 3/2) fine sand; weak medium granular structure; very friable; medium acid; gradual wavy boundary.

Eb—28 to 44 inches; light gray (10YR 7/1) fine sand; single grained; loose; few scattered limestone fragments less than 1 inch in diameter; slightly acid; abrupt irregular boundary.

Btgb—44 to 48 inches; light brownish gray (10YR 6/2) fine sandy loam; yellowish brown (10YR 5/8); clay coated sand grains; neutral; abrupt irregular boundary.

2R—48 inches; hard white (10YR 8/1) limestone; soft in upper 2 inches (can be drilled with an auger).

Reaction ranges from strongly acid to moderately alkaline in fill material and is medium acid or slightly acid in the Ab, Eb, and Btgb horizons. The thickness of the fill material ranges from 20 to 50 inches in most areas. Depth to hard limestone bedrock is 40 to 60 inches.

The C horizon has hue of 10YR, value of 3 to 8, and chroma of 1 to 8; or hue of 5GY, value of 5, and chroma of 1. The matrix is a mixture of gravelly fine sand material and 15 to 25 percent, by volume, limestone rock fragments that are less than 3 inches in diameter. Scattered pieces of sandy clay loam material, less than 3 inches in diameter, are randomly scattered throughout.

The Ab horizon has hue of 10YR, value of 2 to 6, and chroma of 1 or 2. Texture is fine sand. The Ab horizon is 2 to 7 inches thick.

The Eb horizon has hue of 10YR, value of 5 to 8, and chroma of 1 to 8. Texture is fine sand. The Eb horizon is 10 to 22 inches thick.

The Btgb horizon has hue of 10YR, value of 5 to 8, and chroma of 1 or 2. Mottles of higher chroma are common to many; or the Btgb horizon is mottled in varying shades of gray, brown, and yellow. Texture is fine sandy loam or sandy clay loam. The Btgb horizon extends to a depth of 40 to 60 inches.

The 2R horizon is hard limestone bedrock.

Micanopy Series

The Micanopy series consists of deep, nearly level to gently sloping, somewhat poorly drained, slowly permeable soils that formed in loamy and clayey marine deposits. They are in small areas on the upland ridges. The slopes are smooth to concave and range from 0 to 5 percent. Micanopy soils are fine, mixed, hyperthermic Aquic Paleudalfs.

Micanopy soils are associated with Kendrick, Lochloosa, and Sparr soils. Kendrick soils are similar to Micanopy soils but are well drained. Lochloosa and Sparr soils have A and E horizons that combined are more than 20 inches thick.

Typical pedon of Micanopy loamy fine sand, 2 to 5 percent slopes; in a wooded area, about 2 miles east of Citrus County Road 491, NE1/4SE1/4 sec. 26, T. 18 S., R. 18 E.

A1—0 to 4 inches; black (10YR 2/1) loamy fine sand; moderate medium granular structure; very friable; many fine and medium roots; medium acid; clear smooth boundary.

A2—4 to 8 inches; very dark gray (10YR 3/1) loamy fine sand; moderate medium granular structure; very friable; many fine and medium roots; medium acid; clear smooth boundary.

E—8 to 15 inches; brown (10YR 4/3) loamy fine sand; moderate medium granular structure; very friable; many fine and medium roots; medium acid; clear wavy boundary.

Bt—15 to 25 inches; yellowish brown (10YR 5/4) sandy clay; common medium distinct strong brown (7.5YR 5/6) mottles and grayish brown (10YR 5/2) mottles; few fine faint light brownish gray streaks; weak medium subangular blocky structure; firm; common fine roots; very strongly acid; gradual smooth boundary.

Btg1—25 to 40 inches; gray (10YR 5/1) sandy clay; few medium distinct yellowish brown (10YR 5/6) mottles and many coarse prominent dusky red (10R 3/4) mottles; moderate medium subangular blocky structure; firm; common fine roots; very strongly acid; gradual wavy boundary.

Btg2—40 to 55 inches; gray (10YR 5/1) sandy clay; few fine faint yellowish brown (10YR 5/6) mottles and many coarse prominent dusky red (10R 3/4) mottles; moderate medium subangular blocky structure; firm; few coarse roots; very strongly acid; gradual wavy boundary.

BCg—55 to 63 inches; mottled light brownish gray (10YR 6/2), very pale brown (10YR 7/3), yellowish brown (10YR 5/6), strong brown (7.5YR 5/6), and yellowish red (5YR 4/8) sandy clay; weak medium subangular blocky structure; friable; very strongly acid.

The solum is 60 or more inches thick. Reaction ranges from extremely acid to medium acid.

The A horizon has hue of 10YR, value of 2 to 5, and chroma of 1 or 2; or it is neutral and has value of 2 to 5. Texture is loamy fine sand. The A horizon is 4 to 8 inches thick.

The E horizon has hue of 10YR, value of 4 to 6, and chroma of 3 or 4. Texture is dominantly loamy fine sand. The thickness of the E horizon is less than 8 inches.

In some pedons, a BA horizon is at the surface of the Bt horizon. This BA horizon is less than 5 inches thick. It has hue of 10YR, value of 5 or 6, and chroma of 3 to 6. Texture of the BA horizon is sandy loam or fine sandy loam.

The Bt horizon has hue of 10YR, value of 5 or 6, and chroma of 3 to 6. Texture is sandy clay loam, sandy clay, or clay. The Btg horizon has hue of 10YR, value of 5 or 6, and chroma of 1; or it is neutral and has value of 5 or 6. Texture is sandy clay or clay. The Btg horizon has common to many, medium to coarse, distinct to prominent mottles in shades of gray, yellow, brown, and red. The content of plinthite is 0 to 5 percent, by volume, in the Bt horizon.

The BCg horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1; or it is neutral and has value of 5 to 7. In some pedons, the BCg horizon is mottled in varying shades of gray, brown, and red. Texture is clay, sandy clay, or sandy clay loam. Fragments of limestone in the BCg horizon is less than 5 percent, by volume. The limestone fragments are 3 to 15 millimeters in size.

Myakka Series

The Myakka series consists of deep, nearly level, poorly drained, moderately permeable to moderately rapidly permeable soils that formed in sandy marine deposits. These soils are on the flatwoods. THe slopes are 2 percent or less. Myakka soils are sandy, siliceous, hyperthermic Aeric Haplaquods.

Myakka soils are associated with Basinger, EauGallie, Immokalee, Pompano, and Tavares soils. Basinger soils do not have a continuous spodic horizon. EauGallie soils have both a Bt horizon and a Bh horizon. Immokalee soils have A and E horizons that combined are more than 30 inches thick. Pompano and Tavares soils do not have a Bh horizon. In addition, Tavares soils are moderately well drained.

Typical pedon of Myakka fine sand; in a pasture, 1 mile west of U.S. Highway 19, 50 feet north of a trail road, NW1/4SW1/4 sec. 24, T. 20 S., R. 17 E.

A—0 to 4 inches; black (10YR 2/1) fine sand, crushed; weak medium granular structure; very friable; many fine roots; very strongly acid; gradual wavy boundary.

E1—4 to 10 inches; dark gray (10YR 4/1) fine sand; single grained; loose; many fine and medium roots; very strongly acid; gradual wavy boundary.

E2—10 to 27 inches; gray (10YR 6/1) fine sand; single grained; loose; few fine roots; very strongly acid; abrupt irregular boundary.

Bh1—27 to 42 inches; black (10YR 2/1) fine sand; massive, parting to weak medium subangular blocky structure when disturbed; friable; few fine roots; sand grains well coated with colloidal organic material; common uncoated to weakly coated sand grains; extremely acid; gradual wavy boundary.

Bh2—42 to 55 inches; dark reddish brown (5YR 3/2) fine sand;.weak medium subangular blocky structure; friable; sand grains coated with colloidal organic material; very strongly acid; gradual wavy boundary.

BC—55 to 67 inches; dark brown (7.5YR 4/4) fine sand; single grained; loose; strongly acid; gradual wavy boundary.

1Bh'—67 to 80 inches; dark brown (10YR 3/3) fine sand; single grained; loose; many sand grains coated with colloidal organic material slightly acid.

The solum is more than 60 inches thick. Reaction ranges from extremely acid to slightly acid. Depth to hard limestone bedrock ranges from 50 to more than 80 inches.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1; or it is neutral and has value of 2 to 4. Texture of the A horizon is fine sand.

The E horizon has hue of 10YR or 2.5Y, value of 4 to 8, and chroma of 1 or 2; or it is neutral and has value of 6 to 8. In some pedons, the E horizon has mottles of gray, yellow, or brown. The thickness of the E horizon ranges from 12 to 25 inches. The combined thickness of the A and E horizons ranges from 20 to 30 inches. Texture of the E horizon is sand or fine sand.

The Bh horizon has hue of 5YR to 10YR, value of 2 to 3, and chroma of 1 to 3; or it is neutral and has value of 2 or 3. Medium or coarse, vertical or horizontal tongues or pockets of gray, light brownish gray, or light gray sand range from none to common in the Bh horizon. Texture is sand, fine sand, loamy sand, or loamy fine sand. The Bh horizon is 8 to 36 inches thick.

The BC horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 2 or 4. Texture is sand or fine sand. The BC horizon is less than 14 inches thick.

Some pedons have a Bh/C horizon. The Bh part of the Bh/C horizon has the same range of colors as the Bh horizon. The C part of the Bh/C horizon has the same range of colors as the C horizon. Texture of the Bh/C horizon is sand and or fine sand. This horizon is less than 14 inches thick.

The Bh' horizon has colors and textures similar to the Bh horizon. Some pedons have an E' horizon above a Bh' horizon. The E' horizon has color and texture similar to the E horizon.

Some pedons have a C horizon. The C horizon has hue of 7.5YR, 10YR, value of 4 to 7, and chroma of 1 to 4. Texture of the C horizon is sand or fine sand.

Okeelanta Series

The Okeelanta series consists of deep, nearly level, very poorly drained, organic soils that formed in a mixture of well decomposed hyrophytic nonwoody plant material and small amounts of mineral materials. These soils are in small depressions and large freshwater marshes. The slopes are less than 2 percent. Okeelanta soils are sandy or sandy-skeletal, siliceous, euic, hyperthermic Terric Medisaprists.

Okeelanta soils are also associated with Lauderhill and Terra Ceia soils. Lauderhill soils have 20 to 40 inches of organic material underlain by hard bedrock. Terra Ceia soils have an organic horizon that is more than 51 inches thick.

Typical pedon of Okeelanta muck, in an area of Terra Ceia-Okeelanta association, frequently flooded; in a swamp, 3.5 miles east of U.S. Highway 41, 1,000 feet south of Trail End Road, SW1/4SW1/4 sec. 8, T. 20 S., R. 21 E.

Oa1—0 to 10 inches; black (10YR 2/1) muck; about 20 percent fiber, unrubbed, and less than 5 percent fiber, rubbed; weak medium and coarse granular structure; very friable; many fine roots; many fine pores; about 10 percent mineral content; sodium pyrophosphate extract dark brown (10YR 3/3); mildly alkaline (Hellige-Troug test); gradual wavy boundary.

Oa2—10 to 27 inches; dark brown (10YR 3/3) muck; about 15 percent fiber, unrubbed, and less than 5 percent fiber, rubbed; massive; very friable; many fine and medium roots; many fine pores; about 10 percent mineral content; sodium pyrophosphate extract dark brown (10YR 4/3); mildly alkaline (Hellige-Troug test); clear wavy boundary.

Cg—27 to 65 inches; light gray (10YR 7/2) fine sand; common medium distinct dark gray (10YR 4/1) and very dark gray (10YR 3/1) mottles; single grained; loose; few fine roots in upper 20 inches; scattered vertical muck pockets about 8 inches long in upper 20 inches; mildly alkaline.

Organic material ranges from 16 to 40 inches in thickness, and it is underlain by sandy mineral material. Reaction of the organic material ranges from medium acid to moderately alkaline using the Hellige-Troug test, and the pH is 4.5 or above when 0.01 molar calcium chloride is used.

The Oa horizon has hue of 5YR to 10YR, value of 2 to 4, and chroma of 1 to 3; or it is neutral and has value of 2. The content of the fiber ranges from 5 to about 50 percent, unrubbed, and from 3 to 16 percent, rubbed. Sodium pyrophosphate extract has hue of 7.5YR to 10YR, value of 2 to 6, and chroma of 2 to 4. Mineral content ranges from 5 to about 40 percent. In some pedons, a 2 to 7 inch thick horizon of less decomposed, hemic material is on the surface.

The Cg horizon extends to a depth of 80 inches or more. It has hue of 10YR, value of 2 to 7, and chroma of 1 or 2; or it is neutral and has value of 2 to 7. In some pedons, pockets and streaks of sapric material are in the upper part of the horizon. Texture is generally fine sand, but the texture can range from fine sand to loamy fine sand. Reaction ranges from strongly acid to mildly alkaline.

Ona Series

The Ona series consists of deep, nearly level, poorly drained, moderately permeable soils that formed in sandy marine deposits. These soils are on the broad flatwoods. The slopes are 2 percent or less. Ona soils are sandy, siliceous, hyperthermic Typic Haplaquods.

Ona soils are associated with Adamsville, Basinger, Boca, EauGallie, Myakka, and Tavares soils. Adamsville, Boca, and Tavares soils do not have a Bh horizon. Myakka soils have a Bh horizon at a depth of more than 20 inches. Basinger soils have a discontinuous Bh horizon. EauGallie soils have a Bt horizon below the Bh horizon.

Typical pedon of Ona fine sand; in a cleared area, 2.6 miles north of intersection of U.S. Highway 19 and Citrus County Road 488, 1.5 miles east of U.S. Highway 19, SW1/4SW1/4 sec. 7, T. 17 S., R. 17 E.

A—0 to 8 inches; very dark gray (10YR 3/1) fine sand; crushed; weak medium granular structure; very friable; many fine roots; very strongly acid; gradual wavy boundary.

Bh—8 to 20 inches; dark brown (7.5YR 3/2) fine sand; massive, parting to weak fine granular structure; friable; few fine and few medium roots; sand grains coated with collodial organic material; common uncoated to weakly coated sand grains; very strongly acid; gradual wavy boundary.

C1—20 to 42 inches; light yellowish brown (10YR 6/4) fine sand; common medium faint grayish brown (10YR 5/2) mottles and dark gray (10YR 4/1) mottles; single grained; loose; strongly acid; gradual wavy boundary.

C2—42 to 74 inches; very pale brown (10YR 8/4) fine sand; few fine faint grayish brown mottles; single grained; loose; strongly acid; gradual wavy boundary.

C3—74 to 80 inches; brown (10YR 5/3) fine sand; single grained; loose; strongly acid.

Reaction ranges from extremely acid to medium acid. Texture is sand or fine sand except in the A horizon that is dominantly fine sand and in the Bh horizon that includes loamy sand or loamy fine sand.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2; or it is neutral and has value of 3. In many pedons, a gray or light gray E horizon that is about 2 inches thick is between the A horizon and the Bh horizon. The A horizon is 4 to 9 inches thick.

The Bh horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 or 2; or is neutral and has value of 2. In some pedons, it is mottled in shades of brown, black, or gray. Sand grains are thinly to thickly coated with organic matter. The Bh horizon is 6 to 20 inches thick. A BC horizon is in some pedons. This horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 2 to 4. In many pedons, bodies of a Bh material are in the BC horizon. Some pedons have a bisequum of E' and B'h horizons below the Bh horizon and may not have a C horizon.

Some pedons have a C horizon that has hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 1 to 4. The C horizon extends to a depth of 80 inches or more.

Orsino Series

The Orsino series consists of deep, nearly level to gently sloping, moderately well drained, very rapidly permeable soils that formed in sandy marine or eolian deposits. These soils are on knolls and ridges throughout the eastern part of the county. The slopes mostly are between 0 and 3 percent, but in some areas they range from 0 to 5 percent. Orsino soils are hyperthermic uncoated Spodic Quartzipsamments.

Orsino soils are associated with Basinger, Paola, Pomello, and Tavares soils. Basinger soils are poorly drained. Paola soils are excessively drained. Pomello soils have a continuous spodic horizon. Tavares soils are similar to Orsino soils but do not have a Bh horizon.

Typical pedon of Orsino fine sand, 0 to 5 percent slopes; in a wooded area, 1.6 miles north of intersection of U.S. Highway 41 and Florida State Highway 48, 3.2 miles east of U.S. Highway 41, SE1/4SE1/4 sec. 7, T. 20 S., R. 21 E.

A—0 to 5 inches; dark grayish brown (10YR 4/2) fine sand; single grained; loose; few fine roots; mixed uncoated sand grains and finely divided organic material, unrubbed; medium acid; gradual wavy boundary.

E—5 to 14 inches; white (10YR 8/1) fine sand; single grained; loose; few fine and medium roots; medium acid; gradual wavy boundary.

Bw/Bh1—14 to 19 inches; brownish yellow (10YR 6/6) fine sand; common medium pockets of weakly cemented brown (10YR 4/3) and dark brown (10YR 3/3)fine sand; few tongues of a light color material, mixed throughout; single grained; loose; few fine roots; medium acid; gradual wavy boundary.

Bw/Bh2—19 to 48 inches; very pale brown (10YR 7/4) fine sand; few fine distinct yellow (10YR 8/6) mottles; common pockets of weakly cemented dark brown (10YR 4/3) and brown (10YR 5/3) fine sand; single grained; loose; medium acid; gradual wavy boundary.

C—48 to 80 inches; white (10YR 8/2) fine sand; common medium distinct yellow (10YR 8/6) mottles and few fine distinct yellow (10YR 7/8) mottles; single grained; loose; medium acid.

Texture is sand or fine sand. The content of silt and clay in the 10- to 40-inch control section is less than 5 percent. Reaction ranges from extremely acid to medium acid.

The A horizon has hue to 10YR, value of 4 to 6, and chroma of 1 or 2. A mixture of dark organic matter and light gray sand grains gives this horizon a salt-and-pepper appearance, when dry. The A horizon is 2 to 4 inches thick.

The E horizon has hue of 10YR, value of 6 to 8, and chroma of 1 or 2. The E horizon is 8 to 28 inches thick.

The Bw part of the Bw/Bh horizon has hue of 10YR, value of 4 to 7, and chroma of 4 to 8. The Bh part of the Bw/Bh horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 or 3. This horizon is 10 to more than 30 inches thick.

The C horizon extends to a depth of 80 inches or more. It has hue of 10YR, value of 6 to 8, and chroma of 1 to 4; or hue of 10YR, value of 8, and chroma of 1 to 4.

Paisley Series

The Paisley series consists of deep, nearly level, poorly drained, slowly permeable soils that formed in clayey marine sediment influenced by calcareous material. These soils are in the eastern part of the county. The slopes generally are less than 1 percent. Paisley soils are fine, montmorillonitic, hyperthermic Typic Albaqualfs.

Paisley soils are associated with Basinger, Boca, EauGallie, Immokalee, Malabar, and Myakka soils. EauGallie, Immokalee, and Myakka soils have a continuous Bh horizon. Basinger soils do not have a Bt horizon. Malabar soils have a Bt horizon at a depth of more than 40 inches. Boca soils have limestone bedrock at a depth of 24 to 40 inches.

Typical pedon of Paisley fine sand; in a wooded area, 100 feet west of the Withlacoochee River, 1 mile north of Citrus County Road 581, SW1/4SW1/4 sec. 14, T. 18 S., R. 20 E.

A—0 to 5 inches; very dark gray (10YR 3/1) fine sand; single grained; loose; many fine and medium roots; slightly acid; abrupt wavy boundary.

E—5 to 15 inches; light brownish gray (10YR 6/2) fine sand; single grained; loose; common fine roots; slightly acid; clear smooth boundary.

Btg1—15 to 24 inches; dark gray (10YR 4/1) sandy clay loam; common medium distinct strong brown (7.5YR 4/6) mottles and very dark grayish brown (10YR 3/2) mottles; moderate, medium subangular blocky structure; firm; common fine roots; slightly acid; gradual wavy boundary.

Btg2—24 to 33 inches; gray (10YR 6/1) sandy clay; common medium distinct brownish yellow (10YR 6/6) mottles and dark yellowish brown (10YR 4/6) and strong brown (7.5YR 4/6) mottles; moderate medium subangular blocky structure; firm, sticky; few fine and medium roots; mildly alkaline; gradual wavy boundary.

Btg3—33 to 52 inches; light gray (10YR 7/1) sandy clay; common medium prominent brownish yellow (10YR 6/6) mottles and dark yellowish brown (10YR 4/6) mottles; common distinct white (10YR 8/1) soft calcareous nodules; strong medium subangular blocky structure; firm, sticky; few fine roots; moderately alkaline; clear wavy boundary.

BCg—52 to 80 inches; light gray (10YR 7/1) sandy clay mixed with pockets of soft white (10YR 8/1) calcareous material; common medium prominent olive yellow (2.5Y 6/6) mottles; weak medium subangular blocky structure; firm, sticky; moderately alkaline.

The solum is 50 to 75 inches or more thick. Reaction is medium acid or slightly acid in the A and E horizons and is slightly acid to moderately alkaline in the Btg and BCg horizons. In some pedons, a few limestone cobbles or boulders are at a depth of 50 inches or more.

The A horizon has hue of 10YR, value of 4 or less, and chroma of 1; or it is neutral and has a value of 2. Texture is fine sand. The A horizon is 2 to 8 inches thick.

Some pedons have an E horizon that has hue of 10YR, value of 5 to 6, and chroma of 1 or 2. Texture is fine sand or loamy fine sand. The E horizon is 0 to 12 inches thick.

The Btg horizon has hue of 10YR, value of 4 to 7, and chroma of 1. Texture is sandy clay or clay. Few to common bodies of semihard, white (10YR 8/1) carbonatic material are in some pedons. In some pedons, the upper part of the Btg horizon is sandy clay loam; but the particle-size control section has a weighted average of more than 35 percent clay. The Btg horizon is 30 to 50 inches thick.

The BCg horizon has hue of 10YR, value of 5 to 7, and chroma of 1. In this horizon, pockets of soft white (10YR 8/1) carbonatic material range from 0 to 10 percent, by volume. They are 1 to 2 inches thick. Texture is sandy clay. The BCg horizon is 10 to more than 30 inches thick.

Paola Series

The Paola series consists of deep, moderately sloping, excessively drained, very rapidly permeable soils that formed in sandy marine deposits. These soils are on the uplands. The slopes range from 0 to 8 percent. Paola soils are hyperthermic, uncoated Spodic Quartzipsamments.

Paola soils are associated with Astatula, Candler, Immokalee, Myakka, and Pomello soils. Astatula and Candler soils do not have a subsoil. Immokalee, Myakka, and Pomello soils are in lower positions on the landscape than Paola soils and have a Bh horizon. In addition, Immokalee and Myakka soils are poorly drained, and Pomello soils are moderately well drained.

Typical pedon of Paola fine sand, 0 to 5 percent slopes; in a wooded area, 1 mile north of Citrus County Road 470, 1.1 miles southeast of Citrus County Road 581, NE1/4SW1/4 sec. 35, T. 18 S., R. 20 E.

A—0 to 3 inches; gray (10YR 5/1) fine sand, rubbed; mixed white fine sand grains and finely divided organic materials, unrubbed; single grained; loose; many medium and coarse roots; very strongly acid; clear smooth boundary.

E—3 to 26 inches; white (10YR 8/1) fine sand; single grained; loose; few medium and coarse roots; few faint dark gray stains along root channels; strongly acid; clear irregular boundary.

B/E—26 to 64 inches; brownish yellow (10YR 6/6) fine sand; few to common tongues of a material of light color mixed throughout; single grained; loose; few fine and medium roots; outer edges of tongues are mixed yellowish red (5YR 5/6), dark brown (7.5YR 4/4) and strong brown (7.5YR 5/6) fine sand grains slightly to moderately well coated with colloidal organic material; a few scattered weakly cemented areas of a darker color; few fine spheroidal very dark grayish brown (10YR 3/2) concretions scattered throughout; strongly acid; clear irregular boundary.

C—64 to 80 inches; very pale brown (10YR 7/4) fine sand; single grained; loose; few fine roots; few fine faint strong brown and dark brown stains along root channels; common white (10YR 8/1) fine sand pockets; medium acid.

Texture is sand or fine sand. Depth to the B/E horizon ranges from 8 to 45 inches. Reaction ranges from very strongly acid to neutral. The content of silt and clay in the 10- to 40-inch control section is less than 5 percent.

The A horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2; or it is neutral and has value of 4 to 6. The thickness of the A horizon is 2 to 5 inches.

The E horizon has hue of 10YR, value of 6 to 8, and chroma of 1. The thickness of the E horizon is 6 to 40 inches.

The B part of the B/E horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 4 to 8. Thin discontinuous layers that have hue of 5YR to 10YR, value of 3 to 4, and chroma of 3 to 4 line the margins of the sandy intrusions of the E horizon. The E part of the B/E horizon has hue of 10YR, value of 6 to 8, and chroma of 1. The thickness of the B/E horizon is 12 to 40 inches.

The C horizon extends to a depth of 80 inches or more. It has hue of 10YR, value of 6 to 8, and chroma of 2 to 6.

Pedro Series

The Pedro series consists of shallow, nearly level to gently sloping, well drained, moderately rapidly permeable soils that formed in sandy and loamy marine deposits underlain by limestone bedrock. These soils are on the coastal plain. The slopes range from 2 to 5 percent. Pedro soils are fine-loamy, siliceous, hyperthermic, shallow Typic Hapludalfs.

Pedro soils are associated with Arredondo, Kendrick, Micanopy, and Williston soils. Arredondo and Kendrick soils have a sandy epipedon more than 20 inches thick. Micanopy soils are in lower positions on the landscape than Pedro soils, and they are somewhat poorly drained. Williston soils have soft limestone bedrock at a depth of more than 20 inches.

Typical pedon of Pedro fine sand, in an area of Williston-Pedro-Rock outcrop complex, 2 to 5 percent slopes; in a wooded area, 3 miles west of the Withlacoochee River on Florida State Highway 48, 1.1 miles north of Florida State Highway 48, SE1/4SW1/4 sec. 18, T. 20 S., R. 21 E.

A—0 to 5 inches; dark gray (10YR 4/1) fine sand; single grained; loose; few fine and medium roots; slightly acid; gradual wavy boundary.

E—5 to 15 inches; very pale brown (10YR 7/3) fine sand; single grained; loose; few fine and medium roots; slightly acid; gradual wavy boundary.

Bt—15 to 18 inches; brownish yellow (10YR 6/6) sandy clay loam, weak fine subangular blocky structure; very friable; few limestone fragments less than 15 millimeters in diameter, mildly alkaline; abrupt irregular boundary.

2Cr—18 to 35 inches; white (10YR 8/2), soft limestone rock (can be cut with a spade); strongly alkaline.

2R—35 inches; hard limestone bedrock.

These soils are cyclic. The thickness of the solum and depth to the soft limestone bedrock range from 8 to 20 inches; but in some places within the pedon, the depth to the soft limestone bedrock ranges from 20 to about 55 inches. Depth to hard limestone bedrock ranges dominantly from 25 to 40 inches; but in some places within the pedon, the depth to hard limestone bedrock ranges from 40 to 80 inches.

The A horizon has hue of 10YR, value of 4 to 7, and chroma of 1. Texture is sand or fine sand. Reaction ranges from strongly acid to slightly acid. The A horizon is 2 to 6 inches thick.

The E horizon has hue of 10YR, value of 6 to 7, and chroma of 3 or 4. Texture is sand or fine sand. Reaction ranges from strongly acid to slightly acid. The E horizon is 4 to 16 inches thick.

The Bt horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. Texture is sandy clay loam. Reaction ranges from slightly acid to mildly alkaline. In most pedons, few fine and medium fragments of soft and hard limestone are in this horizon. The Bt horizon is 3 to 10 inches thick.

The 2Cr horizon is weathered limestone that has hue of 10YR, value of 8, and chroma of 1 or 2.

Some pedons have a 2R horizon of hard limestone bedrock.

Pineda Series

The Pineda series consists of deep, nearly level poorly drained, slowly permeable to very slowly permeable soils that formed in sandy and loamy marine sediments. These soils are in low, flat areas mainly near the coast. The slopes are 0 to 1 percent. Pineda soils are loamy, siliceous, hyperthermic Arenic Glossaqualfs.

Pineda soils are associated with Basinger, Boca, EauGallie, Hallandale, Myakka, and Pompano soils. Basinger soils have a discontinuous Bh horizon. Boca soil are underlain by bedrock at a depth of 24 to 40 inches. EauGallie and Myakka soils have a Bh horizon. Hallandale soils have bedrock within 20 inches of the surface. Pompano soils do not have a Bt horizon.

Typical pedon of Pineda fine sand, limestone substratum, in an area of Boca-Pineda, limestone substratum complex; in a wooded swamp, 3.2 miles west of U.S. Highway 19, 1.5 miles north of Florida State Highway 44 west, SE1/4SE1/4 sec. 2, T. 18 S., R. 16 E.

A—0 to 2 inches; dark grayish brown (10YR 4/2) fine sand; weak medium granular structure; very friable; many fine and few medium roots; strongly acid; clear smooth boundary.

E—2 to 5 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; few fine roots; strongly acid; abrupt wavy boundary.

Bw1—5 to 10 inches; brownish yellow (10YR 6/8) fine sand; single grained; loose; strongly acid; clear wavy boundary.

Bw2—10 to 25 inches; strong brown (7.5YR 5/8) fine sand; single grained; loose; medium acid; clear wavy boundary.

E'—25 to 28 inches; light yellowish brown (10YR 6/4) fine sand; single grained; loose; medium acid; abrupt wavy boundary.

Btg—28 to 42 inches; light brownish gray (2.5Y 6/2) sandy clay loam; weak medium subangular blocky structure; slightly sticky and slightly plastic; pale brown (10YR 6/3) vertical intrusions of fine sand; weak fine granular structure and loose, single grained; very friable; neutral; abrupt irregular boundary.

R—42 inches; hard limestone bedrock.

The thickness of the solum and depth to hard limestone bedrock are 40 to 80 inches. Depth to the Btg horizon is 20 to 40 inches. Reaction ranges from very strongly acid to neutral in the A, E, Bw, and E' horizons and from strongly acid to moderately alkaline in the Btg horizon.

The A horizon has hue of 10YR, value of 2 to 5, and chroma of 1 or 2; or it is neutral and have value of 2 to 4. If the value is 3.5 or less, the horizon is less than 10 inches thick. Texture is sand or fine sand. The thickness of the A horizon is 1 to 7 inches.

Some pedons have an E horizon that has hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 2 or 3; or it is neutral and has value of 5 to 8. Texture is sand or fine sand. The thickness of the E horizon is less than 10 inches.

The Bw horizon has hue of 10YR or 7.5YR, value of 5 to 7, and chroma of 6 to 8. Texture is sand or fine sand. The Bw horizon is 7 to 22 inches thick.

Some pedons have an E' horizon that has hue of 10YR, value of 6 to 8, and chroma of 2 to 4. Texture is sand or fine sand. In some pedons, a 1 or 2 inch weakly expressed Bh horizon is at the base of the E' horizon.

The Btg horizon has hue of 10YR to 5GY, value of 4 to 7, and chroma of 1 or 2; or it is neutral and has value of 4 to 7. Vertical, sandy intrusion of the E' horizon extends into the Btg horizon. Texture is sandy loam, fine sandy loam, or sandy clay loam. The Btg horizon extends to the bedrock.

The R horizon is hard limestone bedrock.

Pomello Series

The Pomello series consists of deep, nearly level to gently sloping, moderately well drained, moderately permeable soils that formed in sandy marine deposits. They are on slightly elevated ridges and knolls on the flatwoods. The slopes mainly are 3 percent or less, but in some areas, they are up to 5 percent. Pomello soils are sandy, siliceous, hyperthermic Arenic Haplohumods.

Pomello soils are associated with Basinger, EauGallie, Immokalee, Myakka, and Paola soils. Basinger, EauGallie, Immokalee, and Myakka soils are poorly drained. In addition, Basinger soils do not have a continuous spodic horizon. Paola soils are excessively drained and do not have a spodic horizon.

Typical pedon of Pomello fine sand, 0 to 5 percent slope; in a wooded area, 0.7 of a mile south of Florida State Highway 44, 500 feet south of East Boy Scout Road, SE1/4SE1/4 sec. 8, T. 19 S., R. 21 E.

A1—0 to 3 inches; dark gray (10YR 4/1) fine sand; single grained; loose; many fine and medium roots; medium acid; clear wavy boundary.

A2—3 to 5 inches; light brownish gray (10YR 6/2) fine sand; single grained; loose; many fine and medium roots; medium acid; gradual wavy boundary.

E—5 to 31 inches; white (10YR 8/1) fine sand; few fine faint dark grayish brown streaks along root channels; single grained; loose; common fine and medium roots; medium acid; clear wavy boundary.

Bh1—31 to 34 inches; black (10YR 2/1) fine sand; weak fine granular structure; very friable; few fine roots; few scattered pockets of dark brown (10YR 3/3) fine sand; sand grains well coated with colloidal organic material; very strongly acid; gradual wavy boundary.

Bh2—34 to 52 inches; dark brown (7.5YR 3/2) fine sand; massive, parting to weak fine granular structure when disturbed; very friable; few scattered pockets of dark yellowish brown (10YR 4/4) fine sand; many sand grains well coated with colloidal organic material; few to common white to gray uncoated sand grains; strongly acid; gradual wavy boundary.

BC—52 to 80 inches; brown (10YR 4/3) fine sand; few fine faint dark brown mottles; single grained; loose; few fine roots; medium acid.

The solum is more than 60 inches thick. Texture is sand or fine sand. Reaction ranges from very strongly acid to medium acid. Depth to the Bh horizon ranges from 30 to 50 inches.

The A horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2; or it is neutral and has value of 6 or 7. In many pedons, the A horizon, if undisturbed, is a mixture of white to gray sand grains and finely divided organic material. The thickness of the A horizon ranges from 1 to 6 inches.

The E horizon has hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 1 or 2; or it is neutral and has value of 6 to 8. The combined thickness of the A and E horizons ranges from 30 to 50 inches.

The Bh horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 to 4. In some pedons, the Bh horizon contains scattered pockets of weakly to firmly cemented Bh material. The thickness of the Bh horizon ranges from 8 to 30 inches.

The BC horizon has hue of 5YR to 10YR, value of 3 or 4, and chroma of 3 or 4. The BC horizon extends to a depth of 60 inches or more.

Some pedons have a Bw horizon below the Bh horizon. The matrix of the Bw horizon has hue of 10YR, value of 3 to 5, chroma of 3 or 4. Weakly cemented fragments of Bh bodies are in the Bw horizon. The Bw horizon extends to a depth of 60 inches or more.

Some pedons have a C horizon. This horizon has hue of 10YR, value of 5 to 7, and chroma of 1 to 4. The C horizon extends to a depth of 80 inches or more.

Pompano Series

The Pompano series consists of deep, nearly level, poorly drained, very rapidly permeable soils that formed in sandy marine deposits. These soils are in broad, low, flat areas at the edges of some lakes and rivers, in poorly defined drainageways, and in depressions. The slopes are 0 to 2 percent. Pompano soils are siliceous, hyperthermic Typic Psammaquents.

Pompano soils are associated with Adamsville, Basinger, EauGallie, Hallandale, Immokalee, and Myakka soils. Adamsville soils are on slightly elevated ridges and are somewhat poorly drained. Basinger soils have a discontinuous Bh horizon. EauGallie, Immokalee, and Myakka soils have a spodic horizon.

Typical pedon of Pompano fine sand; in a wooded area, 0.5 of a mile south of the Withlacoochee River, 7.5 miles east of U.S. Highway 41 in the Grand Prairie.

A—0 to 5 inches; black (10YR 2/1) fine sand, rubbed; weak fine granular structure; very friable; many fine and medium roots; mixture of finely divided organic material, unrubbed, and gray to white sand grains with a salt-and-pepper appearance; medium acid; gradual smooth boundary.

C1—5 to 15 inches; light brownish gray (10YR 6/2) fine sand; single grained; loose; many fine and medium roots; common medium distinct dark grayish brown (10YR 4/2) stains along root channels; slightly acid; gradual wavy boundary.

C2—15 to 45 inches; light gray (10YR 7/1) fine sand; few fine faint dark brown mottles; single grained; loose; many fine and medium roots; strongly acid; gradual wavy boundary.

C3—45 to 80 inches; light gray (10YR 7/1) fine sand; single grained; loose; strongly acid.

Texture is sand or fine sand. Reaction ranges from very strongly acid to mildly alkaline.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 2 to 5, and chroma of 1 or 2; or it is neutral and has value of 2 to 5. The thickness of the A horizon ranges from 2 to 28 inches.

The C horizon extends to a depth of more than 80 inches. It has hue of 10YR to 5GY, value of 5 to 8, and chroma of 1 to 3; or it is neutral and has value of 5 to 8.

Redlevel Series

The Redlevel series consists of deep, nearly level, somewhat poorly drained, rapidly permeable soils that formed in sandy marine deposits underlain by limestone bedrock. These soils are in the western part of the county on the flatwoods. The slopes are 0 to 2 percent. Redlevel soils are hyperthermic, coated Aquic Quartzipsamments.

Redlevel soils are associated with Adamsville, Boca, Broward, Hallandale, and Pompano soils. Adamsville and Pompano soils do not have limestone bedrock within 80 inches of the surface and are uncoated. Boca and Broward soils have limestone bedrock within 40 inches of the surface. Hallandale soils have bedrock within 20 inches of the surface.

Typical pedon of Redlevel fine sand; in a forested area, 0.6 of a mile west of U.S. Highway 19, 30 feet south of a trail road, NE1/4SE1/4 sec. 23, T. 17 S., R. 16 E.

A1—0 to 3 inches; dark brown (10YR 3/3) fine sand; weak medium granular structure; very friable; few fine and medium roots; very strongly acid; gradual wavy boundary.

A2—3 to 7 inches; dark grayish brown (10YR 4/2) fine sand; single grained; loose; few fine and medium roots; very strongly acid; gradual wavy boundary.

Bw1—7 to 15 inches; yellowish brown (10YR 5/8) fine sand; single grained; loose; few fine and many medium roots; strongly acid; gradual wavy boundary.

Bw2—15 to 26 inches; strong brown (7.5YR 5/8) fine sand; few medium distinct yellowish red (5YR 5/8) mottles; weak medium granular structure; very friable; few medium roots; slight increase in fines; strongly acid; gradual wavy boundary.

Bw3—26 to 42 inches; strong brown (7.5YR 5/8) fine sand; few medium distinct yellowish red (5YR 5/8) mottles; weak medium granular structure; very friable; few medium roots; slight increase in fines; very strongly acid; gradual wavy boundary.

Bw4—42 to 55 inches; yellowish brown (10YR 5/8) fine sand; weak medium granular structure; very friable; few scattered marine shells and limestone fragments less than 1 inch in diameter; very strongly acid; abrupt wavy boundary.

2R—55 inches; white (10YR 8/1) hard limestone with common fractures 2 to 6 inches wide.

Reaction ranges from strongly acid to moderately alkaline. After wetting and drying, reaction can become very strongly acid. Depth to bedrock ranges from 40 to 60 inches. Solution pits are in some pedons at a depth of 80 inches or more. Texture is fine sand.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 to 4. The A horizon is 4 to 8 inches thick.

Some pedons have an E horizon that has hue of 10YR, value of 5 or 6, and chroma of 2. The E horizon is less than 5 inches thick.

The Bw horizon has hue of 5YR to 10YR, value of 4 to 7, and chroma of 4 to 8. Many sand grains in the Bw horizon are coated with clay material and iron oxides. In most pedons, the content of clay increases gradually with depth, but the increase in clay is less than 3 percent as compared to the overlying horizon and fails to meet the requirements for an argillic horizon. The Bw horizon extends to a depth of 40 to 60 inches.

The 2R horizon is hard limestone bedrock.

Sparr Series

The Sparr series consists of deep, nearly level to moderately sloping, somewhat poorly drained, slowly permeable soils that formed in sandy and loamy marine deposits. These soils are on seasonally wet upland ridges. The slopes are smooth to concave and range from 0 to 8 percent. Sparr soils are loamy, siliceous, hyperthermic Grossarenic Paleudults.

Sparr soils are associated with Arredondo, Kendrick, and Lochloosa soils. Arredondo soils are similar to Sparr soil but do not have a water table within 6 feet of the surface. In addition, Arredondo soils are poorly drained. Kendrick and Lochloosa soils have a Bt horizon within 40 inches of the surface. In addition, Kendrick soils are well drained.

Typical pedon of Sparr fine sand, 0 to 5 percent slopes; in a cultivated field, 0.5 of a mile west of Citrus County Road 491; 0.2 of a mile north of Florida State Highway 44, SW1/4NW1/4 sec. 3, T. 19 S., R 18 E.

AP—0 to 8 inches; grayish brown (10YR 5/2) fine sand; weak medium granular structure; very friable; many fine and medium roots; very strongly acid; gradual wavy boundary.

E1—8 to 12 inches; brown (10YR 5/3) fine sand; single grained; loose; few fine and medium roots; very strongly acid; gradual wavy boundary.

E2—12 to 35 inches; pale brown (10YR 6/3) fine sand; common fine distinct light gray (10YR 7/2) mottles in lower part; single grained; loose; very strongly acid; gradual wavy boundary.

E3—35 to 50 inches; very pale brown (10YR 7/3) fine sand; single grained; loose; few fine faint yellowish brown mottles and common fine distinct light gray (10YR 7/2) mottles; few scattered lenses of uncoated sand grains; very strongly acid; gradual wavy boundary.

Bt1—50 to 59 inches; light yellowish brown (10YR 6/4) fine sandy loam; few fine faint yellowish brown mottles; weak medium granular structure; very friable; very strongly acid; gradual wavy boundary.

1Bt2—59 to 70 inches; light yellowish brown (10YR 6/4) sandy clay loam; common medium distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; firm; sand grains coated and bridged with colloidal clay; strongly acid; clear wavy boundary.

Btg—70 to 80 inches; light brownish gray (10YR 6/2) sandy clay loam; many distinct prominent strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm; sand grains coated and bridged with colloidal clay; strongly acid.

The solum is 60 inches or more thick. Reaction ranges from very strongly acid to slightly acid.

The A horizon has hue of 10YR, value of 2 to 5, and chroma of 1 or 2. Texture is fine sand. The A horizon is 3 to 10 inches thick.

The E horizon has hue of 10YR, value of 5 to 8, and chroma of 1 to 4. Texture is fine sand. The combined thickness of the A and E horizons ranges from 40 to 75 inches.

Some pedons have an EB horizon below the E horizon. The EB horizon has hue of 10YR, value of 5 or 6, and chroma of 4 to 8. Texture is fine sand.

Some pedons have a Bt horizon that has hue of 10YR, value of 5 to 7, and chroma of 3 to 8. Texture is sandy loam, fine sandy loam, or sandy clay loam. The Btg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2; or it is mottled in varying shades of gray, yellow, brown, and red. Texture is sandy loam, fine sandy loam, sandy clay loam, or light sandy clay. In some pedons, the content of plinthite in the Bt horizon is less than 5 percent, by volume.

Tavares Series

The Tavares series consists of deep, nearly level to gently sloping, moderately well drained, rapidly permeable to very rapidly permeable soils that formed in thick beds of sandy marine or eolian deposits. These soils are on knolls and ridges throughout most of the county and on the lower elevations on the upland ridges. The slopes mostly are between 0 and 3 percent, but in some areas they are up to 5 percent. Tavares soils are hyperthermic, uncoated Typic Quartzipsamments.

Tavares soils are associated with Adamsville, Apopka, Astatula, Candler, Lake, Immokalee, Myakka, and Pompano soils. In addition, Adamsville soils are somewhat poorly drained; Apopka soils are well drained; and Astatula, Candler, and Lake soils are excessively drained. Immokalee and Myakka soils have a Bh horizon, and they are poorly drained. Pompano soils are poorly drained.

Typical pedon of Tavares fine sand, 0 to 5 percent slopes; in a wooded area, 1.5 miles west of U.S. Highway 19, 6 miles north of Hernando County Line, SE1/4NW1/4 sec. 11, T. 20 S., R. 17 E.

A—0 to 3 inches; dark grayish brown (10YR 4/2) fine sand; single grained; loose; few fine roots; mixed uncoated sand grains and finely divided organic material, unrubbed; strongly acid; gradual wavy boundary.

C1—3 to 41 inches; very pale brown (10YR 7/4) fine sand; single grained; loose; few fine, medium and coarse roots; very strongly acid; gradual wavy boundary.

C2—41 to 63 inches; very pale brown (10YR 7/4) fine sand; few fine and medium faint yellowish brown (10YR 5/8) mottles; single grained; loose; strongly acid; gradual wavy boundary.

C3—63 to 80 inches; white (10YR 8/1) fine sand; few medium distinct very pale brown (10YR 7/4) mottles; single grained; loose; strongly acid.

Texture is sand or fine sand except in the A horizon. The A horizon is dominantly fine sand. The content of silt and clay in the 10- to 40-inch control section is less than 5 percent.

The A or Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 1; or hue of 10YR, value of 3 or 4, and chroma of 2. Reaction ranges from extremely acid to medium acid. The thickness of the A horizon ranges from 3 to 9 inches.

The C horizon extends to a depth of 80 inches or more. The upper part of the C horizon has hue of 10YR, value of 5, and chroma of 2, 3, 6, or 8; or hue of 10YR, value of 6 or 7, and chroma of 3 or 4. The lower part has hue of 10YR, value of 6, and chroma of 1 or 3; or hue of 10YR, value of 7, and chroma of 1 to 4; or hue of 10YR, value of 8, and chroma of 1 or 2 or less. The lower part of the C horizon generally has mottles of brown, yellow, or red. Mottles that have chroma of 2 or less are within 40 inches of the surface in some pedons. These colors are the result of the sand grains in the horizon and are not indicative of wetness. Reaction in the C horizon ranges from very strongly acid to medium acid.

Terra Ceia Series

The Terra Ceia series consists of deep, nearly level, very poorly drained, rapidly permeable to very rapidly permeable soils that formed in a mixture of hydrophytic nonwoody plant material and small amounts of mineral material. The organic material is more than 52 inches thick. These soils are in small depressions and large freshwater swamps. The slopes are less than 2 percent. Terra Ceia soils are euic, hyperthermic Typic Medisaprists.

Terra Ceia soils are associated with Basinger, Lauderhill, Myakka, Okeelanta, and Pompano soils. Basinger, Myakka, and Pompano soils are mineral soils. Lauderhill soils are organic soils that have limestone bedrock within 40 inches of the surface. Okeelanta soils are organic soils that have a mineral horizon within 40 inches of the surface.

Typical pedon of Terra Ceia muck, in an area of Okeelanta-Lauderhill- Terra Ceia mucks; in a swamp, 100 feet south of Salt Creek, 2 miles north of Hernando County Line, 2 miles west of U.S. Highway 19, NE1/4NE1/4 sec. 27, T. 20 S., R. 17 E.

Oa1—0 to 8 inches; black (N 2/0) muck; about 20 percent fiber, unrubbed, and less than 5 percent fiber, rubbed; weak fine and medium granular structure; very friable; many fine and medium roots; about 15 percent mineral content; mildly alkaline; gradual wavy boundary.

Oa2—8 to 80 inches; very dark brown (10YR 2/2) muck; about 30 percent fiber, unrubbed, and less than 5 percent fiber, rubbed; massive; very friable; about 20 percent mineral content; few vertical sand streaks at a depth of more than 60 inches; mildly alkaline.

Reaction is 4.5 or more using 0.01 molar calcium chloride and medium acid to moderately alkaline when the Hellige-Truog test is used.

The Oa horizon has hue of 5YR, value of 2, and chroma of 1 or 2; hue of 10YR, value of 2, and chroma of 1 or 2; or it is neutral and has value of 2. The content of fiber, rubbed, ranges from 2 to 16 percent. Mineral content between depths of 16 and 52 inches ranges from about 5 to 40 percent. At a depth of more than 52 inches, the organic material is underlain by sandy, loamy, or clayey material.

Weekiwachee Series

The Weekiwachee series consists of moderately deep to deep, nearly level, very poorly drained, moderately rapidly permeable soils. These organic soils contain 0.75 percent or more sulfur. They formed in well decomposed sapric material underlain by sand and limestone bedrock. These soils are in broad tidal marsh areas. The slopes are less than 1 percent. They are flooded daily by tides. Weekiwachee soils are euic, hyperthermic Terric Sulfihemists.

Weekiwachee soils are associated with Durbin Homosassa, and Lacoochee soils. Durbin soils are organic but do not have limestone bedrock within 80 inches of the surface. Homosassa and Lacoochee soils are mineral soils.

Typical pedon of Weekiwachee muck, in an area of Weekiwachee-Durbin mucks; in a coastal marsh, 500 feet north of Florida State Road 44 west, 1 mile east of Fort Island, SW1/4NW1/4 sec. 15, T. 17 S., R. 16 E.

Oa1—0 to 6 inches; black (N 2/0) muck; about 12 percent fiber, unrubbed, and less than 5 percent fiber, rubbed; weak fine granular structure; slight odor of sulfur when freshly exposed; neutral in water at field moisture (air dry pH 5.5 in 0.01 molar calcium chloride; gradual wavy boundary.

Oa2—6 to 34 inches; black (N 2/0) muck; about 30 percent fiber, unrubbed, and less than 5 percent fiber, rubbed; weak fine granular structure; very friable; few fine and medium roots; few scattered pieces dark brown (10YR 3/3) woody material up to 8 centimeters in diameter; few very dark gray (10YR 3/1) fine sand vertical streaks; about 50 percent mineral content; strong odor of sulfur when freshly exposed; neutral in water at field moisture (air dry pH 4.7 in 0.01 molar calcium chloride; gradual wavy boundary.

C1—34 to 38 inches; dark gray (10YR 4/1) fine sand; common medium distinct very dark gray (10YR 3/1) mottles; massive; very friable; neutral; abrupt irregular boundary.

Cr—38 to 41 inches; white (10YR 8/1) soft limestone; massive; very firm; moderately alkaline; calcareous; abrupt irregular boundary.

R—41 inches; hard white (10YR 8/1) limestone (can be chipped but not dug with a spade).

The content of sulfur ranges from 0.75 to 4 percent or more above the Cr horizon. Saturated paste extract conductivity is more than 16 millimhos per centimeter above the Cr horizon. Reaction in water ranges from slightly acid to mildly alkaline in the natural state. After air drying, the pH ranges from 4.5 to 5.5 in 0.01 molar calcium chloride except in the Oa1 horizon where it ranges from 4.5 to 7.3.

The Oa horizon has hue of 5YR to 10YR, value of 3, and chroma of 1 to 3; or it is neutral and has value of 2 or 3. The content of fiber, unrubbed, is about 30 percent or less; and the content of fiber, rubbed, is less than 5 percent. In many pedons, pieces of wood and small masses of fiberous material that are resistant to destruction by rubbing are few to common in the lower part of the Oa horizon, and vertical streaks of sand or mucky sand range from none to few. Mineral content is predominantly less than 65 percent. The combined thickness of the Oa horizons ranges from 16 to 36 inches.

The C horizon has hue of 10YR, value of 2 to 4, chroma of 1 or 2. This horizon can have mottles and streaks of gray and brown. The content of organic matter in the C horizon ranges from 2 to 15 percent; streaks and pockets of organic matter are none to common; and the content of hard limestone nodules, up to 2 inches in diameter, is less than 5 percent. The C horizon is absent in a few pedons. The combined thickness of the Oa and C horizons ranges from 30 to 40 inches.

The Cr horizon has hue of 10YR, value of 7 or 8, and chroma of 1 or 2. Hard limestone fragments occur randomly throughout. The Cr horizon is made up of about 35 percent, by volume, of these limestone fragments. Solution holes range from none to common. When solution holes are in a horizon, they are filled with sand and hard limestone fragments.

The R horizon is hard limestone bedrock. The R horizon is commonly at a depth of 40 to 51 inches but can range from 40 to 60 inches or more.

Williston Series

The Williston series consists of moderately deep, gently sloping, well drained, moderately slowly permeable soils that formed in clayey marine sediment underlain by soft limestone. These soils are in small areas on the upland ridges. The slopes are smooth to concave and range from 2 to 5 percent. Williston soils are fine, mixed, hyperthermic Typic Hapludalfs.

Williston soils are associated with Arredondo, Kendrick, Micanopy, and Pedro soils. Arredondo and Kendrick soils have a sandy epipedon more than 20 inches thick. Micanopy soils are in lower positions on the landscape than Williston soils, and they are poorly drained. Pedro soils have soft limestone within 20 inches of the surface.

Typical pedon of Williston loamy fine sand, in an area of Williston-Pedro-Rock outcrop complex, 2 to 5 percent slopes; 0.2 of a mile west of the Withlacoochee River on Florida State Highway 48, 1.1 miles north of Florida State Highway 48, SE1/4SW1/4 sec. 18, T. 20 S., R. 21 E.

A—0 to 4 inches; very dark gray (10YR 3/1) loamy fine sand; weak fine granular structure; very friable; many fine and medium roots; slightly acid; gradual wavy boundary.

AB—4 to 14 inches; dark brown (10YR 3/3) loamy fine sand; weak fine granular structure; very friable; few fine roots; neutral; gradual wavy boundary.

Bt—14 to 24 inches; strong brown (7.5YR 5/6) sandy clay, weak fine subangular blocky structure; friable; neutral; gradual wavy boundary.

Cr—24 to 60 inches; white (10YR 8/2) soft limestone bedrock.

The thickness of the solum and depth to soft limestone bedrock range from 20 to 40 inches but are variable over short distances.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. Texture is fine sand or loamy fine sand. Reaction ranges from strongly acid to neutral. The A horizon is 3 to 7 inches thick.

The AB horizon has hue of 10YR, value of 3 to 6, and chroma of 3 to 6. Texture is fine sand or loamy fine sand. Reaction ranges from strongly acid to neutral. The thickness of the AB horizon is 6 to 10 inches.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 8. Texture is andy clay loam or sandy clay. Reaction ranges from strongly acid to neutral. The Bt horizon is 8 to 16 inches thick.

The Cr horizon extends to a depth of 60 inches or more. It has hue of 10YR, value of 8, and chroma of 1 or 2. Boulders of hard limestone are few to many.

Formation of the Soils

This section discusses the factors of soil formation, relates them to the morphology of formation of the soils in the survey area, and explains the processes of soil formation.

Factors of Soil Formation

Soil is formed by weathering and other processes that act on the parent material. The characteristics of the soil are determined by five major factors: parent material, climate, plants and animals, relief, and time.

Climate and plants and animals are the active forces of soil formation. They act on the parent material that has accumulated through the weathering of rocks and slowly change it into soils. The relative importance of the five major factors differs from place to place. In extreme cases, one factor can dominate in the formation of a soil and fix most of its properties. In general, however, it is the combined action of these factors that determines the present character of each soils.

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 soils in Citrus County formed in materials of late Miocene, Pleistocene, and Holocene ages *(3)*. Approximately 55 percent of the soils in the county formed in Pleistocene sands and clays of the Coharie-Okefenokee Sand Ridge and Wicomico Terrace. Small areas of soils that formed in Miocene deposits occur within these two areas where the overlying Pleistocene sands have eroded.

The Pamlico Terrace is adjacent to the Gulf of Mexico and consists of mineral soil that formed in Pleistocene sands and of organic soil that formed in Holocene deposits underlain by undulating tertiary limestone. The depth to limestone ranges from surface exposures in the coastal marshes to about 20 feet at the eastern boundary of the Pamlico Terrace.

The Tsala Apopka Lake Plain in eastern Citrus County is part of a rolling plain where soils of depressional basins formed in organic material of Holocene age. Soils in slightly higher positions on the landscape formed in clastic sediment of Miocene and Pleistocene age. Recent fluvial deposits of sands and clays are in many areas along the Withlacoochee River.

Climate

Citrus County has a tropical climate near the coast and a subtropical climate west of the coastal area. The relatively high year-round temperature and large amount of rainfall continuously leach and translocate soluble minerals. This leaching and translocation of soluble minerals result in the soils having only small amounts of organic matter and soluble plant nutrients. An exception is the soils that were once covered with organic material and have fairly high amounts of organic material in the surface layer. Although the climate changes from tropical to humid subtropical, this has caused few differences among the soils.

Plants and Animals

Plants have been the principal biological factor in the formation of soils in the area, but animals, insects, bacteria, and fungi have also been important. Two of the chief functions of plant and animal life are to furnish organic matter and to bring plant nutrients from the lower layers to the upper layers. In places, plants and animals cause differences in the amount of organic matter, nitrogen, and plant nutrients in the soils and differences in soil structure and porosity.

Relief

Relief has affected the formation of soils in the area 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.

The survey area can be divided into three areas based on relief and associated with three major physiographic regions of the county. The physiographic regions are—the Pamlico Terrace and Wicomico Terrace, the Coharie-Okefenokee Sand Ridge, and the Tsala Apopka Lake Plain. The flatwoods and coastal marshes are on the Pamlico and Wicomico Terraces, the upland ridges are on the Coharie-Okefenokee Sand Ridge, and the river valley lowlands are on the Tsala Apopka Lake Plain. Differences in the soils in these areas are directly related to differences in relief.

The Pamlico and Wicomico Terraces have elevations ranging from 15 to 100 feet except for the coastal marshes which are 0 to 5 feet above sea level. The soils on the terraces have a high water table, and the surface layer is periodically wet. These soils, therefore, are not so highly leached as some of the soils on the upland ridges.

The upland ridges have elevations ranging from 100 to 220 feet. These soils are dominantly excessively drained and are not influenced by a water table. Most of the soils of the Tsala Apopka Lake Plain, such as soils on the flatwoods, have a high water table, and a surface layer that is periodically wet. In this area, however, are small sandy ridges that are better drained.

Time

Time is an important factor in the formation of soils. Generally, a long time is required for formation of soils that have distinct horizons. The difference in length of time that parent materials have been in place commonly is reflected in the degree of development of the soil.

Some basic minerals from which soils are formed weather fairly rapidly; other minerals change slowly even though weathering has taken place over a long period. The translocation of fine particles in the soil to form the various horizons varies under different conditions. The soil forming processes, however, require a relatively long period. Almost pure quartz sand that is highly resistant to weathering is the dominant geologic material in the county. The organic soils of the lake region and coastal marshes were formed by decaying organic material that built up over the years in shallow water.

In terms of geologic time, the soil material that makes up most of the soils of the area is young. Not enough time has elapsed since the material was laid down or emerged from the sea for pronounced genetic horizons to develop. Some thin, loamy horizons have formed in place through the process of weathering. An example is the Boca soils. A distinct genetic horizon, such as the spodic horizon, has formed in the Immokalee and Pomello soils; however, the time required for its development is relatively short.

Processes of Horizon Differentiation

The main processes involved in the formation of soil horizons are accumulation of organic matter, leaching of calcium carbonate and bases, reduction and transfer of iron, and formation and translocation of silicate clay minerals. These processes can occur in combination, or singly, depending on the integration of the factors of soil formation.

Some organic matter has accumulated in the upper layers of most of the soils to form an A1 horizon. The quantity of organic matter is small in some of the soils but fairly large in others. Leaching of carbonates and salts has occurred in nearly all of the soils. The effects of leaching have been indirect, in that, the leaching permitted the subsequent translocation of silicate clay materials in some soils. Most of the soils in the county are leached to varying degrees.

The reduction and transfer of iron has occurred in most of the soils of Citrus County but not in the organic soils. In some of the wet soils, iron has been segregated in the lower horizons to form reddish brown mottles and concretions. In the Boca soil, evidence of weathering and clay movement, or alteration, is present in the form of a light, leached A2 horizon and a loamy Bt horizon that has sand grains coated and bridged with clay material.

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Glossary

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well-aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity, but is more precise in meaning.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels, i.e., clay coatings, clay skins.

Climax vegetation. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or resting grazingland for a prescribed period.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.
Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.
Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, such as fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay are in the soil. The soil is not a source of gravel or sand for construction purposes.

Fast intake (in tables). The movement of water into the soil is rapid.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine textured soil. Sandy clay, silty clay, and clay.

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.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.5 centimeters) in diameter.

Green-manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric and the more decomposed sapric material.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an 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.

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

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, invader plants follow disturbance of the surface.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Large stones (in tables). Rock fragments that are 3 inches (7.5 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. The soil is not strong enough to support loads.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water to move through the profile. Permeability is measured as the number of inches per hour that water moves through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Subsurface tunnels or pipelike cavities are formed by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor filter (in tables). Because of rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poor outlets. In 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 natural 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 degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Rill. A steep sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rippable. Rippable bedrock or hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 draw bar horsepower rating.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth. 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.

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.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.5 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, 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.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in organic matter content than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace. An embankment, or ridge, constructed on the contour or at a slight angle to the contour across sloping soils. The terrace intercepts surface runoff, so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material is too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Unstable fill (in tables). There is a risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Weathering. All physical and chemical changes produced by atmospheric agents in rocks or other deposits at or near the earth's surface. These changes result in disintegration and decomposition of the material.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Based on data recorded at Inverness, Florida]

Month	Temperature					Precipitation		
	Normal monthly mean	Normal daily maximum	Normal daily minimum	Mean number of days with temperatures of--		Normal total	Mean number of days with rainfall of--	
				90 °F or higher	32 °F or lower		0.10 inch or more	0.50 inch or more
	°F	°F	°F			In		
January----	59.3	71.5	46.1	0	4	2.64	4	2
February---	61.1	74.5	49.4	0	2	3.39	4	2
March*-----	65.5	77.5	52.4	1	+	4.30	5	3
April------	71.6	83.1	59.0	2	0	2.50	5	3
May--------	76.9	89.2	65.0	15	0	3.48	6	3
June-------	80.8	91.8	70.0	23	0	7.07	8	4
July-------	81.8	92.1	72.4	27	0	9.53	13	6
August-----	82.0	92.3	72.6	26	0	9.81	11	5
September--	80.3	90.4	71.3	19	0	6.40	10	4
October----	73.6	83.6	62.9	4	0	3.23	5	2
November*--	65.5	78.0	53.4	+	+	1.54	3	1
December---	60.4	72.2	46.8	0	3	2.40	3	2
Year-----	71.6	83.0	60.1	177	9	56.29	77	37

* In the "Mean number of days" columns, a plus sign indicates more than 0 but less than 0.5.

TABLE 2.--FREEZE DATA

[Information extracted from University of Florida, Institute of Food and Agricultural Sciences, Technical Bulletin 777, June, 1981]

Freeze threshold temperature	Fall dates before which the first freeze threshold temperature will occur for selected probabilities					Freeze threshold temperature	Spring dates after which the last freeze threshold temperature will occur for selected probabilities				
	Fall probabilities						Spring probabilities				
	0.10	0.25	0.50	0.75	0.90		0.90	0.75	0.50	0.25	0.10
°F						°F					
32	Nov 7	Nov 21	Dec 6	Dec 22	Jan 5	32	Jan 18	Feb 4	Feb 23	Mar 14	Mar 31
28	Nov 20	Dec 6	Dec 24	Jan 13	Feb 6	28	Dec 12	Jan 11	Feb 3	Feb 25	Mar 16
24	Dec 6	Dec 24	Jan 16	*	*	24	*	*	Jan 11	Feb 4	Feb 22
20	*	*	*	*	*	20	*	*	*	*	Jan 11
16	*	*	*	*	*	16	*	*	*	*	*

* Frequency of occurrence in either fall or spring is 1 year in 10, or less.

TABLE 3.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
2	Adamsville fine sand	13,184	3.1
3	Candler fine sand, 0 to 5 percent slopes	73,761	17.2
4	Candler fine sand, 5 to 8 percent slopes	7,878	1.8
5	Basinger fine sand	7,619	1.8
6	Basinger fine sand, depressional	8,850	2.1
7	Myakka fine sand	3,044	0.7
8	Paola fine sand, 0 to 5 percent slopes	138	*
9	Pompano fine sand	2,933	0.7
10	Pompano fine sand, depressional	1,263	0.3
11	Tavares fine sand, 0 to 5 percent slopes	30,483	7.1
12	Immokalee fine sand	8,170	1.9
13	Okeelanta muck	747	0.2
14	Lake fine sand, 0 to 5 percent slopes	32,312	7.6
15	Lake fine sand, 5 to 8 percent slopes	2,564	0.6
16	Arredondo fine sand, 0 to 5 percent slopes	19,996	4.7
17	Arredondo fine sand, 5 to 8 percent slopes	6,462	1.5
18	Kendrick fine sand, 0 to 5 percent slopes	4,236	1.0
19	Kendrick fine sand, 5 to 8 percent slopes	1,358	0.3
20	Pits	2,614	0.6
22	Quartzipsamments, 0 to 5 percent slopes	3,654	0.9
23	Weekiwachee-Durbin mucks	9,842	2.3
24	Okeelanta-Lauderhill-Terra Ceia mucks	9,949	2.3
25	Lochloosa fine sand, 0 to 5 percent slopes	1,683	0.4
26	Williston-Pedro-Rock outcrop complex, 2 to 5 percent slopes	300	0.1
27	Pomello fine sand, 0 to 5 percent slopes	901	0.2
28	Redlevel fine sand	2,953	0.7
29	Astatula fine sand, 0 to 5 percent slopes	28,643	6.7
30	Astatula fine sand, 5 to 8 percent slopes	7,630	1.8
31	Sparr fine sand, 5 to 8 percent slopes	192	*
32	Candler-Urban land complex, 0 to 8 percent slopes	1,190	0.3
33	Micanopy loamy fine sand, 2 to 5 percent slopes	1,007	0.2
35	Sparr fine sand, 0 to 5 percent slopes	5,143	1.2
36	EauGallie fine sand	4,598	1.1
37	Matlacha, limestone substratum-Urban land complex	2,006	0.5
38	Rock outcrop-Homosassa-Lacoochee complex	12,775	3.0
39	Hallandale-Rock outcrop complex, rarely flooded	12,011	2.8
40	Homosassa mucky fine sandy loam	7,858	1.8
41	Candler fine sand, 8 to 12 percent slopes	240	0.1
46	EauGallie fine sand, depressional	3,702	0.9
47	Fort Meade loamy fine sand, 0 to 5 percent slopes	1,366	0.3
48	Arents, 45 to 65 percent slopes	1,100	0.3
49	Terra Ceia-Okeelanta association, frequently flooded	11,178	2.6
50	Kanapaha fine sand, 0 to 5 percent slopes	896	0.2
51	Boca-Pineda, limestone substratum complex	3,467	0.8
52	Anclote fine sand, depressional	1,071	0.3
53	Boca fine sand	9,903	2.3
54	Apopka fine sand, 0 to 5 percent slopes	1,423	0.3
55	Udorthents, 0 to 5 percent slopes	5,080	1.2
56	Lake, clayey surface, 0 to 5 percent slopes	1,217	0.3
57	Ona fine sand	1,411	0.3
58	Myakka, limestone substratum-EauGallie, limestone substratum complex	5,717	1.3
59	Boca fine sand, depressional	3,707	0.9
60	Broward fine sand	4,047	0.9
61	Orsino fine sand, 0 to 5 percent slopes	2,011	0.5
62	Malabar sand	2,325	0.5
63	Paisley fine sand	1,269	0.3
64	Citronelle fine sand	1,182	0.3
	Water	25,351	5.9
	Total	427,610	100.0

* Less than 0.1 percent.

TABLE 4.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Map symbol and soil name	Land capability	Oranges	Grapefruit	Watermelons	Corn	Soybeans	Improved bermudagrass	Bahiagrass
		Boxes	Boxes	Tons	Bu	Bu	AUM*	AUM*
2---------- Adamsville	IIIw	375	500	10.0	---	---	7.5	7.0
3---------- Candler	IVs	425	625	10.0	35	---	7.5	7.0
4---------- Candler	VIs	400	600	---	35	---	7.5	6.5
5---------- Basinger	IVw	350	450	---	50	---	---	---
6---------- Basinger	VIIw	---	---	---	---	---	---	---
7---------- Myakka	IVw	350	550	---	---	---	9.0	9.0
8---------- Paola	VIs	250	300	---	---	---	---	---
9---------- Pompano	IVw	300	400	---	---	---	---	8.0
10---------- Pompano	VIIw	---	---	---	---	---	---	---
11---------- Tavares	IIIs	425	600	8.0	60	20	7.5	7.5
12---------- Immokalee	IVw	350	550	---	---	---	9.0	9.0
13---------- Okeelanta	VIIw	---	---	---	---	---	---	---
14---------- Lake	IVs	500	700	10.0	---	---	5.0	4.5
15---------- Lake	VIs	500	700	---	---	---	5.0	4.5
16---------- Arredondo	IIIs	450	650	10.0	55	23	8.0	7.0
17---------- Arredondo	IVs	450	650	9.5	50	20	8.0	7.0
18---------- Kendrick	IIe	525	725	---	60	35	8.5	8.0
19---------- Kendrick	IIIe	525	725	---	55	---	8.5	8.0
20**. Pits								

See footnotes at end of table.

TABLE 4.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Oranges	Grapefruit	Watermelons	Corn	Soybeans	Improved bermudagrass	Bahiagrass
		Boxes	Boxes	Tons	Bu	Bu	AUM*	AUM*
22**. Quartzipsamments								
23:								
Weekiwachee	VIIIw	---	---	---	---	---	---	---
Durbin	VIIIw	---	---	---	---	---	---	---
24:								
Okeelanta	VIIw	---	---	---	---	---	---	---
Lauderhill	VIIw	---	---	---	---	---	---	---
Terra Ceia	VIIw	---	---	---	---	---	---	---
25 Lochloosa	IIw	475	675	11.0	60	---	9.0	9.0
26:								
Williston	IIe	---	---	---	---	---	8.0	7.0
Pedro	IVs	---	---	---	---	---	8.0	7.0
Rock outcrop	VIIIs	---	---	---	---	---	---	---
27 Pomello	VIs	250	400	---	---	---	4.0	3.5
28 Redlevel	IIIw	---	---	---	---	---	---	7.0
29, 30 Astatula	VIs	350	400	10.0	---	---	3.5	3.0
31 Sparr	IVs	415	615	9.5	50	25	10.0	8.0
32**. Candler-Urban land								
33 Micanopy	IIw	475	675	11.0	70	25	10.0	10.0
35 Sparr	IIIw	415	615	10.0	50	25	10.0	9.0
36 EauGallie	IVw	375	575	---	---	---	---	8.0
37**. Matlacha-Urban land								
38:								
Rock outcrop	VIIIs	---	---	---	---	---	---	---
Homosassa	VIIIw	---	---	---	---	---	---	---
Lacoochee	VIIIw	---	---	---	---	---	---	---
39:								
Hallandale	IVw	---	---	---	---	---	---	---

See footnotes at end of table.

TABLE 4.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Oranges	Grapefruit	Watermelons	Corn	Soybeans	Improved bermudagrass	Bahiagrass
		Boxes	Boxes	Tons	Bu	Bu	AUM*	AUM*
39:								
Rock outcrop	VIIIs	---	---	---	---	---	---	---
40 Homosassa	VIIIw	---	---	---	---	---	---	---
41 Candler	VIs	---	---	---	---	---	---	6.5
46 EauGallie	VIIw	---	---	---	---	---	---	---
47 Fort Meade	IIIs	600	750	10.0	60	---	9.0	9.0
48**. Arents								
49:								
Terra Ceia	VIIIw	---	---	---	---	---	---	---
Okeelanta	VIIIw	---	---	---	---	---	---	---
50 Kanapaha	IIIw	475	675	---	55	---	9.0	9.0
51:								
Boca	IVw	---	---	---	---	---	---	---
Pineda	IVw	---	---	---	---	---	---	---
52 Anclote	VIIw	---	---	---	---	---	---	---
53 Boca	IIIw	---	---	---	---	---	---	---
54 Apopka	IIIs	450	650	18.0	---	---	7.5	7.0
55**. Udorthents								
56 Lake	IVs	---	---	---	---	---	---	---
57 Ona	IIIw	350	550	---	---	---	---	8.5
58:								
Myakka	IVw	---	---	---	---	---	---	---
EauGallie	IVw	---	---	---	---	---	---	---
59 Boca	VIIw	---	---	---	---	---	---	---
60 Broward	IVw	---	---	---	---	---	7.5	7.0

See footnotes at end of table.

TABLE 4.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Oranges	Grapefruit	Watermelons	Corn	Soybeans	Improved bermudagrass	Bahiagrass
		Boxes	Boxes	Tons	Bu	Bu	AUM*	AUM*
61------------------------ Orsino	IVs	350	450	---	---	---	8.5	5.0
62------------------------ Malabar	IVw	325	575	---	---	---	---	---
63------------------------ Paisley	IIIw	---	---	---	---	---	10.0	10.0
64------------------------ Citronelle	IVs	---	---	---	---	---	---	---

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit.

TABLE 5.--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 Adamsville	South Florida Flatwoods	6,000	4,500	3,000
3 Candler	Longleaf Pine-Turkey Oak Hills	3,300	2,500	1,500
4 Candler	Longleaf Pine-Turkey Oak Hills	3,300	2,500	1,500
5 Basinger	Slough	8,000	6,000	3,000
6 Basinger	Freshwater Marshes and Ponds	10,000	7,000	5,000
7 Myakka	South Florida Flatwoods	5,500	4,500	3,000
8 Paola	Longleaf Pine-Turkey Oak Hills	4,000	3,000	2,000
9 Pompano	Slough	8,000	6,000	3,000
10 Pompano	Freshwater Marshes and Ponds	10,000	7,000	5,000
11 Tavares	Longleaf Pine-Turkey Oak Hills	4,000	3,000	2,000
12 Immokalee	South Florida Flatwoods	5,500	4,500	3,000
13 Okeelanta	Freshwater Marshes and Ponds	10,000	7,000	3,000
14, 15 Lake	Longleaf Pine-Turkey Oak Hills	4,000	3,000	2,000
16, 17 Arredondo	Longleaf Pine-Turkey Oak Hills	4,000	3,000	2,000
18, 19 Kendrick	Upland Hardwood Hammock	4,500	3,500	3,000
23:				
Weekiwachee	Salt Marsh	8,000	6,000	4,000
Durbin	Salt Marsh	8,000	6,000	4,000
25 Lochloosa	Upland Hardwood Hammock	4,500	3,500	3,000
26:				
Williston	Upland Hardwood Hammock	4,500	3,500	3,000
Pedro	Upland Hardwood Hammock	4,000	3,000	2,500

TABLE 5.--RANGELAND PRODUCTIVITY--Continued

Map symbol and soil name	Range site	Potential annual production for kind of growing season		
		Favorable Lb/acre	Average Lb/acre	Unfavorable Lb/acre
26:				
Rock outcrop.				
27 Pomello	Upland Hardwood Hammock	4,500	3,500	3,000
28 Redlevel	Cabbage Palm Flatwoods	9,000	6,000	4,500
29, 30 Astatula	Longleaf Pine-Turkey Oak Hills	3,300	2,500	2,000
31 Sparr	Upland Hardwood Hammock	4,500	3,500	3,000
33 Micanopy	Upland Hardwood Hammock	5,000	4,000	3,000
35 Sparr	Upland Hardwood Hammock	4,500	3,500	3,000
36 EauGallie	South Florida Flatwoods	6,000	4,500	3,000
38:				
Rock outcrop.				
Homosassa	Salt Marsh	8,000	6,000	4,000
Lacoochee	Salt Marsh	8,000	6,000	4,000
39:				
Hallandale	Cabbage Palm Hammock	4,000	3,000	2,000
Rock outcrop.				
40 Homosassa	Salt Marsh	8,000	6,000	4,000
41 Candler	Longleaf Pine-Turkey Oak Hills	3,300	2,500	1,500
46 EauGallie	Freshwater Marshes and Ponds	10,000	7,000	5,000
47 Fort Meade	Upland Hardwood Hammock	4,500	3,500	3,000
50 Kanapaha	Upland Hardwood Hammock	4,500	3,500	3,000
51:				
Boca	South Florida Flatwoods	6,000	4,500	3,000
Pineda	South Florida Flatwoods	6,000	4,500	3,000
52 Anclote	Freshwater Marshes and Ponds	10,000	7,000	5,000
53 Boca	Cabbage Palm Flatwoods	6,000	4,500	3,000

TABLE 5.--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
54------------------------ Apopka	Longleaf Pine-Turkey Oak Hills----------	4,000	3,000	2,500
57------------------------ Ona	South Florida Flatwoods-----------------	6,000	4,500	3,000
58:				
Myakka--------------------	Cabbage Palm Flatwoods------------------	5,500	5,000	4,000
EauGallie-----------------	Cabbage Palm Flatwoods------------------	5,500	5,000	4,000
59------------------------ Boca	Freshwater Marshes and Ponds------------	10,000	7,000	5,000
60------------------------ Broward	Cabbage Palm Flatwoods------------------	9,000	6,000	4,500
61------------------------ Orsino	Upland Hardwood Hammock-----------------	4,500	3,500	3,000
62------------------------ Malabar	Cabbage Palm Flatwoods------------------	9,000	6,000	4,500
63------------------------ Paisley	Cabbage Palm Flatwoods------------------	9,000	6,000	4,500
64------------------------ Citronelle	Cabbage Palm Flatwoods------------------	9,000	6,000	4,500

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	Trees to plant
2. Adamsville	10W	Slight	Moderate	Moderate	Moderate	Slash pine	80	10	Slash pine, longleaf pine.
						Longleaf pine	65	5	
						Laurel oak	---	---	
						Water oak	---	---	
3, 4. Candler	8S	Slight	Moderate	Moderate	Moderate	Slash pine	70	8	Sand pine, slash pine, longleaf pine.
						Longleaf pine	60	4	
						Sand pine	75	4	
						Turkey oak	---	---	
5. Basinger	8W	Slight	Severe	Severe	Severe	Slash pine	70	8	Slash pine.
						Longleaf pine	60	4	
6. Basinger	2W	Slight	Severe	Severe	Severe	Pondcypress	75	2	**
						Baldcypress	---	---	
						Blackgum	---	---	
						Cabbage palm	---	---	
7. Myakka	8W	Slight	Moderate	Moderate	Moderate	Slash pine	70	8	Slash pine, longleaf pine.
						Longleaf pine	60	4	
8. Paola	2S	Slight	Moderate	Severe	Slight	Sand pine	50	2	Sand pine.
						Sand live oak	---	---	
9. Pompano	8W	Slight	Severe	Severe	Moderate	Slash pine	70	8	Slash pine, longleaf pine.
						Longleaf pine	60	4	
10. Pompano	2W	Slight	Severe	Severe	Severe	Pondcypress	75	2	**
						Baldcypress	---	---	
						Blackgum	---	---	
						Cabbage palm	---	---	
11. Tavares	10S	Slight	Moderate	Moderate	Moderate	Slash pine	80	10	Slash pine, longleaf pine.
						Longleaf pine	70	6	
						Turkey oak	---	---	
						Bluejack oak	---	---	
12. Immokalee	8W	Slight	Moderate	Moderate	Moderate	Slash pine	70	8	Slash pine, longleaf pine.
						Longleaf pine	65	5	
13. Okeelanta	2W	Slight	Severe	Severe	Severe	Pondcypress	75	2	**
14, 15. Lake	10S	Slight	Moderate	Moderate	Moderate	Slash pine	80	10	Slash pine, longleaf pine, sand pine.
						Longleaf pine	65	5	
						Blackjack oak	---	---	
						Bluejack oak	---	---	
						Turkey oak	---	---	
16, 17. Arredondo	10S	Slight	Moderate	Moderate	Moderate	Slash pine	80	10	Slash pine, longleaf pine, loblolly pine.
						Loblolly pine	80	8	
						Longleaf pine	70	6	
						Turkey oak	---	---	
						Magnolia	---	---	

See footnotes at end of table.

TABLE 6.--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	Plant competition	Common trees	Site index	Productivity class*	
18, 19----------- Kendrick	11S	Slight	Moderate	Moderate	Moderate	Slash pine---------- Loblolly pine------- Longleaf pine------- Turkey oak---------- Hickory------------- Magnolia------------	90 90 75 --- --- ---	11 9 6 --- --- ---	Slash pine, loblolly pine, longleaf pine.
24: Okeelanta------	6W	Slight	Severe	Severe	Severe	Baldcypress--------- Sweetgum------------ Water hickory------- Sweetbay------------	100 --- --- ---	6 --- --- ---	**
Lauderhill-----	6W	Slight	Severe	Severe	Severe	Baldcypress--------- Sweetgum------------ Water hickory------- Sweetbay------------	100 --- --- ---	6 --- --- ---	**
Terra Ceia-----	6W	Slight	Severe	Severe	Severe	Baldcypress--------- Sweetgum------------ Water hickory------- Sweetbay------------	100 --- --- ---	6 --- --- ---	**
25-------------- Lochloosa	11A	Slight	Slight	Slight	Slight	Slash pine---------- Loblolly pine------- Dogwood------------- Hickory------------- Live oak------------ Laurel oak---------- Water oak----------- Magnolia------------ Sweetgum------------ Red maple-----------	90 90 --- --- --- --- --- --- --- ---	11 9 --- --- --- --- --- --- --- ---	Slash pine, loblolly pine, longleaf pine.
26: Williston------	11A	Slight	Slight	Slight	Moderate	Slash pine---------- Loblolly pine------- Longleaf pine-------	90 90 75	11 9 6	Slash pine, loblolly pine, longleaf pine.
Pedro----------	10S	Slight	Moderate	Moderate	Slight	Slash pine---------- Loblolly pine------- Longleaf pine------- Live oak------------ Post oak------------ Turkey oak----------	80 80 70 --- --- ---	10 8 6 --- --- ---	Slash pine, loblolly pine, longleaf pine.
Rock outcrop.									
27-------------- Pomello	8S	Slight	Moderate	Severe	Moderate	Slash pine---------- Longleaf pine------- Sand pine-----------	70 60 60	8 4 3	Slash pine, longleaf pine.
28-------------- Redlevel	7W	Slight	Moderate	Moderate	Moderate	Slash pine---------- Longleaf pine------- Cabbage palm--------	60 --- ---	7 --- ---	Slash pine, longleaf pine.

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
29, 30---------- Astatula	3S	Slight	Severe	Moderate	Slight	Sand pine-----------	60	3	Sand pine.
						Turkey oak----------	---	---	
						Bluejack oak--------	---	---	
						Blackjack oak-------	---	---	
31-------------- Sparr	10W	Slight	Moderate	Moderate	Moderate	Slash pine----------	80	10	Slash pine, loblolly pine, longleaf pine.
						Loblolly pine-------	80	8	
						Longleaf pine-------	70	6	
						Laurel oak----------	---	---	
						Water oak-----------	---	---	
						Live oak------------	---	---	
						Dogwood-------------	---	---	
						Magnolia------------	---	---	
						Hickory-------------	---	---	
33-------------- Micanopy	11A	Slight	Slight	Slight	Slight	Slash pine----------	90	11	Slash pine, loblolly pine, longleaf pine.
						Loblolly pine-------	90	9	
						Longleaf pine-------	75	6	
						Magnolia------------	---	---	
						Hickory-------------	---	---	
						Dogwood-------------	---	---	
						Laurel oak----------	---	---	
						Live oak------------	---	---	
						Water oak-----------	---	---	
35-------------- Sparr	10W	Slight	Moderate	Moderate	Moderate	Slash pine----------	80	10	Slash pine, loblolly pine, longleaf pine.
						Loblolly pine-------	80	8	
						Longleaf pine-------	70	6	
						Laurel oak----------	---	---	
						Water oak-----------	---	---	
						Live oak------------	---	---	
						Dogwood-------------	---	---	
						Magnolia------------	---	---	
						Hickory-------------	---	---	
36-------------- EauGallie	10W	Slight	Moderate	Moderate	Moderate	Slash pine----------	80	10	Slash pine, longleaf pine, loblolly pine.
						Longleaf pine-------	70	6	
39:									
Hallandale-----	8W	Slight	Moderate	Moderate	Moderate	Slash pine----------	70	8	Slash pine.
Rock outcrop.									
41-------------- Candler	8S	Slight	Moderate	Moderate	Moderate	Slash pine----------	70	8	Sand pine, slash pine.
						Longleaf pine-------	60	4	
						Sand pine-----------	75	4	
						Turkey oak----------	---	---	
46-------------- EauGallie	2W	Slight	Severe	Severe	Severe	Pondcypress---------	75	2	**
						Baldcypress---------	---	---	
						Blackgum------------	---	---	
						Cabbage palm--------	---	---	

See footnotes at end of table.

TABLE 6.--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	Plant competition	Common trees	Site index	Productivity class*	
47------------- Fort Meade	10S	Slight	Slight	Slight	Moderate	Slash pine----------	80	10	Slash pine, longleaf pine.
						Loblolly pine-------	80	8	
						Longleaf pine-------	70	6	
						Redosier dogwood----	---	---	
						Southern magnolia---	---	---	
						Laurel oak----------	---	---	
						Live oak------------	---	---	
						Post oak------------	---	---	
						Turkey oak----------	---	---	
						Hickory-------------	---	---	
						Cabbage palm--------	---	---	
49:									
Terra Ceia-----	6W	Slight	Severe	Severe	Severe	Baldcypress---------	100	6	**
						Sweetgum------------	---	---	
						Water oak-----------	---	---	
Okeelanta------	6W	Slight	Severe	Severe	Severe	Baldcypress---------	100	6	**
						Sweetgum------------	---	---	
						Water hickory-------	---	---	
						Sweetbay------------	---	---	
						Water oak-----------	---	---	
50------------- Kanapaha	10W	Slight	Moderate	Moderate	Moderate	Slash pine----------	80	10	Slash pine, longleaf pine, loblolly pine.
						Loblolly pine-------	80	8	
						Longleaf pine-------	70	6	
						Sweetgum------------	---	---	
						Maple---------------	---	---	
						Live oak------------	---	---	
						Water oak-----------	---	---	
						Magnolia------------	---	---	
						Hickory-------------	---	---	
51:									
Boca-----------	8W	Slight	Moderate	Moderate	Moderate	Slash pine----------	70	8	Slash pine, loblolly pine.
Pineda---------	8W	Slight	Moderate	Moderate	Moderate	Slash pine----------	70	8	Slash pine, loblolly pine.
52------------- Anclote	2W	Slight	Severe	Severe	Severe	Pondcyrpess---------	75	2	**
						Baldcypress---------	---	---	
						Blackgum------------	---	---	
						Cabbage palm--------	---	---	
53------------- Boca	8W	Slight	Moderate	Moderate	Moderate	Slash pine----------	70	8	Slash pine.
54------------- Apopka	10S	Slight	Moderate	Moderate	Slight	Slash pine----------	80	10	Slash pine, loblolly pine, longleaf pine.
						Loblolly pine-------	80	8	
						Longleaf pine-------	70	6	
						Turkey oak----------	---	---	
						Bluejack oak--------	---	---	
						Post oak------------	---	---	
						Live oak------------	---	---	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
56-------------- Lake	8S	Slight	Moderate	Moderate	Moderate	Slash pine---------- Sand pine----------- Longleaf pine------- Live oak------------ Water oak-----------	70 75 60 --- ---	8 4 4 --- ---	Slash pine, sand pine, longleaf pine.
57-------------- Ona	10W	Slight	Moderate	Moderate	Moderate	Slash pine---------- Longleaf pine-------	80 70	10 6	Slash pine, longleaf pine.
58:									
Myakka----------	6W	Slight	Moderate	Moderate	Moderate	Slash pine---------- Longleaf pine-------	55 60	6 4	Slash pine, longleaf pine.
EauGallie-------	10W	Slight	Moderate	Moderate	Moderate	Slash pine---------- Cabbage palm--------	80 ---	10 ---	Slash pine, longleaf pine, loblolly pine.
59-------------- Boca	2W	Slight	Severe	Severe	Severe	Pondcypress--------- Baldcypress--------- Blackgum------------ Cabbage palm--------	75 --- --- ---	2 --- --- ---	**
60-------------- Broward	8W	Slight	Moderate	Moderate	Moderate	Slash pine----------	70	8	Slash pine.
61-------------- Orsino	8S	Slight	Moderate	Severe	Moderate	Slash pine---------- Longleaf pine------- Sand pine----------- Sand live oak------- Turkey oak----------	70 60 70 --- ---	8 4 4 --- ---	Slash pine, longleaf pine.
62-------------- Malabar	10W	Slight	Moderate	Severe	Moderate	Slash pine---------- Longleaf pine-------	80 70	10 6	Slash pine, longleaf pine, loblolly pine.
63-------------- Paisley	13W	Slight	Severe	Severe	Severe	Slash pine---------- Loblolly pine------- Live oak------------ Cabbage palm-------- Sweetgum------------ Hickory-------------	100 100 --- --- --- ---	13 9 --- --- --- ---	Slash pine, loblolly pine, longleaf pine.
64-------------- Citronelle	8W	Slight	Moderate	Severe	Moderate	Slash pine---------- Longleaf pine------- Cabbage palm--------	70 --- ---	8 --- ---	Slash pine, longleaf pine.

* Productivity class is the yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

** No recommended trees to plant due to severe ratings for management concerns. Trees are harvested, but regrowth is due to natural regeneration. Also, a source of desirable seedlings is not readily available.

TABLE 7.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
2-------------------- Adamsville	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty, too sandy.
3-------------------- Candler	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
4-------------------- Candler	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Severe: droughty.
5-------------------- Basinger	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
6-------------------- Basinger	Severe: ponding.	Severe: ponding, too sandy.	Severe: too sandy, ponding.	Severe: ponding, too sandy.	Severe: ponding.
7-------------------- Myakka	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
8-------------------- Paola	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
9-------------------- Pompano	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
10------------------- Pompano	Severe: ponding, too sandy.	Severe: ponding, too sandy.	Severe: too sandy, ponding.	Severe: ponding, too sandy.	Severe: ponding, droughty.
11------------------- Tavares	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
12------------------- Immokalee	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
13------------------- Okeelanta	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
14------------------- Lake	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
15------------------- Lake	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Severe: droughty.
16------------------- Arredondo	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
17------------------- Arredondo	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Moderate: droughty.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
18 Kendrick	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
19 Kendrick	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Moderate: droughty.
20. Pits					
22. Quartzipsamments					
23: Weekiwachee	Severe: flooding, wetness, excess humus.	Severe: wetness, excess humus, excess salt.	Severe: excess humus, wetness, flooding.	Severe: wetness, excess humus.	Severe: excess salt, excess sulfur, wetness.
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.
24: Okeelanta	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
Lauderhill	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
Terra Ceia	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
25 Lochloosa	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Slight.
26: Williston	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight	Moderate: thin layer.
Pedro	Severe: too sandy, depth to rock.	Severe: too sandy, depth to rock.	Severe: too sandy, depth to rock.	Severe: too sandy.	Severe: droughty, thin layer.
Rock outcrop.					
27 Pomello	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
28 Redlevel	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
29 Astatula	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
30-------------------- Astatula	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Severe: droughty.
31-------------------- Sparr	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Moderate: wetness, droughty.
32:					
Candler--------------	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
Urban land.					
33-------------------- Micanopy	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: wetness.
35-------------------- Sparr	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: wetness, droughty.
36-------------------- EauGallie	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, droughty.
37:					
Matlacha-------------	Severe: too sandy.	Severe: too sandy.	Severe: too sandy, small stones.	Severe: too sandy.	Moderate: too sandy, large stones, small stones.
Urban land.					
38:					
Rock outcrop.					
Homosassa------------	Severe: flooding, wetness, excess salt.	Severe: wetness, excess salt.	Severe: wetness, flooding, excess salt.	Severe: wetness.	Severe: excess salt, excess sulfur, wetness.
Lacoochee------------	Severe: flooding, wetness.	Severe: wetness, excess salt.	Severe: wetness, flooding.	Severe: wetness.	Severe: excess salt, wetness, flooding.
39:					
Hallandale-----------	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy, depth to rock.	Severe: too sandy, wetness, depth to rock.	Severe: wetness, too sandy.	Severe: wetness, droughty, thin layer.
Rock outcrop.					
40-------------------- Homosassa	Severe: flooding, wetness, excess salt.	Severe: wetness, excess salt.	Severe: wetness, flooding, excess salt.	Severe: wetness.	Severe: excess salt, excess sulfur, wetness.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
41 Candler	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Severe: droughty.
46 EauGallie	Severe: ponding, too sandy.	Severe: ponding, too sandy.	Severe: too sandy, ponding.	Severe: ponding, too sandy.	Severe: ponding.
47 Fort Meade	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
48. Arents					
49:					
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.
Okeelanta	Severe: flooding, excess humus, wetness.	Severe: excess humus, wetness.	Severe: excess humus, flooding, wetness.	Severe: excess humus, wetness.	Severe: flooding, excess humus, wetness.
50 Kanapaha	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
51:					
Boca	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
Pineda	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, droughty.
52 Anclote	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
53 Boca	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
54 Apopka	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
55. Udorthents					
56 Lake	Severe: too clayey.	Severe: too clayey.	Severe: too clayey.	Severe: too clayey.	Severe: too clayey.
57 Ona	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
58:					
Myakka	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
58:					
EauGallie	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
59 Boca	Severe: ponding, too sandy.	Severe: ponding, too sandy.	Severe: too sandy, ponding.	Severe: ponding, too sandy.	Severe: ponding, droughty.
60 Broward	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
61 Orsino	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
62 Malabar	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
63 Paisley	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
64 Citronelle	Severe: too sandy, depth to rock.	Severe: too sandy, depth to rock.	Severe: too sandy, depth to rock.	Severe: too sandy.	Severe: depth to rock.

TABLE 8.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
2-----------------Adamsville	Poor	Poor	Fair	Fair	Fair	---	Poor	Poor	Poor	Fair	Poor.
3, 4---------------Candler	Poor	Poor	Fair	Poor	Poor	---	Very poor.	Very poor.	Poor	Poor	Very poor.
5-----------------Basinger	Poor	Poor	Fair	Poor	Poor	---	Good	Fair	Poor	Poor	Fair.
6-----------------Basinger	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	---	Good	Good	Very poor.	Very poor.	Very poor.
7-----------------Myakka	Poor	Fair	Fair	Poor	Poor	---	Fair	Poor	Fair	Poor	Poor.
8-----------------Paola	Very poor.	Poor	Poor	Poor	Poor	---	Very poor.	Very poor.	Poor	Poor	Very poor.
9-----------------Pompano	Poor	Fair	Poor	Poor	Poor	---	Fair	Fair	Poor	Poor	Fair.
10----------------Pompano	Very poor.	Very poor.	Poor	Poor	Poor	---	Good	Good	Very poor.	Poor	Good.
11----------------Tavares	Poor	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.
12----------------Immokalee	Poor	Poor	Fair	Poor	Poor	---	Fair	Poor	Poor	Poor	Poor.
13----------------Okeelanta	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	---	Good.	Good.	Very poor.	---	Good.
14, 15-------------Lake	Poor	Poor	Fair	Poor	Poor	---	Very poor.	Very poor.	Poor	Poor	Very poor.
16, 17-------------Arredondo	Poor	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.
18, 19-------------Kendrick	Fair	Fair	Good	Good	Good	---	Poor	Poor	Fair	Good	Very poor.
20. Pits											
22. Quartzipsamments											
23:											
Weekiwachee-------	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	---	Fair	Good	Very poor.	Very poor.	Good.
Durbin------------	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	---	Poor	Poor	Very poor.	Very poor.	Poor.
24:											
Okeelanta---------	Very poor.	Very poor.	Poor	Poor	Very Poor.	---	Good	Good	Very Poor.	Poor.	Good.

TABLE 8.--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	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
24:											
Lauderhill	Very poor.	Very poor.	Poor	Poor	Very poor	---	Good	Good	Very poor.	Poor	Good.
Terra Ceia.	Very poor.	Very poor.	Poor	Poor	Very poor	---	Good	Good	Very poor.	Poor	Good.
25 Lochloosa	Fair	Fair	Good	Good	Good	---	Poor	Very poor.	Fair	Good	Very poor.
26:											
Williston	Fair	Fair	Good	Good	Good	---	Poor	Very poor.	Fair	Good	Very poor.
Pedro	Poor	Fair	Fair	Poor	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.
Rock outcrop	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
27 Pomello	Poor	Poor	Poor	Poor	Poor	---	Very poor.	Very poor.	Poor	Poor	Very poor.
28 Redlevel	Poor	Poor	Fair	Fair	Fair	---	Poor	Poor	Poor	Fair	Poor.
29, 30 Astatula	Poor	Poor	Poor	Poor	Poor	---	Very poor.	Very poor.	Poor	Poor	Very poor.
31 Sparr	Poor	Fair	Good	Fair	Fair	---	Poor	Fair	Fair	Fair	Poor.
33 Micanopy	Fair	Fair	Good	Good	Good	---	Poor	Very poor.	Fair	Good	Very poor.
35 Sparr	Poor	Fair	Good	Fair	Fair	---	Poor	Fair	Fair	Fair	Poor.
36 EauGallie	Poor	Poor	Fair	Poor	Poor	---	Poor	Poor	Poor	Poor	Poor.
38:											
Rock outcrop	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
Homosassa	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	---	Fair	Good	Very poor.	Very poor.	Good.
Lacoochee	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	---	Poor	Very poor.	Very poor.	Very poor.	Poor.
39:											
Hallandale	Poor	Poor	Poor	Poor	Poor	---	Fair	Good	Poor	Poor	Fair.
Rock outcrop	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
40 Homosassa	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	---	Fair	Good	Very poor.	Very poor.	Good.

TABLE 8.--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	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
41----------------- Candler	Poor	Poor	Fair	Poor	Poor	---	Very poor.	Very poor.	Poor	Poor	Very poor.
46----------------- EauGallie	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	---	Fair	Good	Very poor.	Very poor.	Good.
47----------------- Fort Meade	Fair	Fair	Good	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.
48. Arents											
49:											
Terra Ceia--------	Very poor.	Very poor.	Poor	Poor	Very poor.	---	Good	Good	Very poor.	Poor	Good.
Okeelanta---------	Very poor.	Very poor.	Poor.	Poor.	Very poor.	---	Good	Good	Very poor.	Poor	Good.
50----------------- Kanapaha	Poor	Fair	Fair	Fair	Fair	---	Poor	Fair	Fair	Fair	Poor.
51:											
Boca--------------	Poor	Fair	Fair	Poor	Poor	---	Good	Fair	Fair	Poor	Fair.
Pineda------------	Poor	Fair	Fair	Poor	Poor	---	Good	Fair	Fair	Poor	Fair.
52----------------- Anclote	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	---	Good	Good	Very poor.	Very poor.	Good.
53----------------- Boca	Poor	Fair	Fair	Poor	Poor	---	Good	Fair	Fair	Poor	Fair.
54----------------- Apopka	Poor	Fair	Fair	Poor	Fair	---	Very poor.	Very poor.	Fair	Poor	Very poor.
55----------------- Udorthents	Fair	Fair	Fair	Good	Good	---	Poor	Poor	Fair	Good	Poor.
56----------------- Lake	Poor	Poor	Poor	Poor	Poor	---	Very poor.	Very poor.	Poor	Poor	Very poor.
57----------------- Ona	Poor	Fair	Fair	Poor	Fair	---	Fair	Fair	Fair	Fair	Fair.
58:											
Myakka------------	Poor	Poor	Fair	Poor	Poor	---	Fair	Poor	Poor	Poor	Poor.
EauGallie---------	Poor	Poor	Poor	Poor	Poor	---	Poor	Very poor.	Poor	Poor	Poor.
59----------------- Boca	Very poor.	Very poor.	Poor	Very poor.	Very poor.	---	Good	Good	Very poor.	Very poor.	Good.
60----------------- Broward	Poor	Poor	Fair	Fair	Fair	---	Poor	Poor	Poor	Fair	Poor.
61----------------- Orsino	Poor	Poor	Poor	Poor	Poor	---	Very poor.	Very poor.	Poor	Poor	Very poor.
62----------------- Malabar	Poor	Poor	Poor	Poor	Poor	---	Fair	Fair	Poor	Poor	Fair.

TABLE 8.--WILDLIFE HABITAT--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hard-wood trees	Conif-erous plants	Shrubs	Wetland plants	Shallow water areas	Open-land wild-life	Wood-land wild-life	Wetland wild-life
63----------------- Paisley	Poor	Fair	Fair	Fair	Fair	---	Good	Good	Fair	Fair	Good.
64----------------- Citronelle	Poor	Poor	Fair	Poor	Poor	---	Poor	Poor	Poor	Poor	Poor.

TABLE 9.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Shallow excavations	Dwellings without basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
2----------------- Adamsville	Severe: cutbanks cave, wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: droughty, too sandy.
3----------------- Candler	Severe: cutbanks cave.	Slight-----------	Slight-----------	Slight-----------	Severe: droughty.
4----------------- Candler	Severe: cutbanks cave.	Slight-----------	Moderate: slope.	Slight-----------	Severe: droughty.
5----------------- Basinger	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
6----------------- Basinger	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
7----------------- Myakka	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
8----------------- Paola	Severe: cutbanks cave.	Slight-----------	Slight-----------	Slight-----------	Severe: droughty.
9----------------- Pompano	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
10---------------- Pompano	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, droughty.
11---------------- Tavares	Severe: cutbanks cave.	Slight-----------	Slight-----------	Slight-----------	Severe: droughty.
12---------------- Immokalee	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
13---------------- Okeelanta	Severe: cutbanks cave, excess humus, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding.	Severe: ponding, excess humus.
14---------------- Lake	Severe: cutbanks cave.	Slight-----------	Slight-----------	Slight-----------	Severe: droughty.
15---------------- Lake	Severe: cutbanks cave.	Slight-----------	Moderate: slope.	Slight-----------	Severe: droughty.
16---------------- Arredondo	Severe: cutbanks cave.	Slight-----------	Slight-----------	Slight-----------	Moderate: droughty.
17---------------- Arredondo	Severe: cutbanks cave.	Slight-----------	Moderate: slope.	Slight-----------	Moderate: droughty.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
18---------------- Kendrick	Severe: cutbanks cave.	Slight-----------	Slight-----------	Slight-----------	Moderate: droughty.
19---------------- Kendrick	Severe: cutbanks cave.	Slight-----------	Moderate: slope.	Slight-----------	Moderate: droughty.
20. Pits					
22. Quartzipsamments					
23:					
Weekiwachee------	Severe: cutbanks cave, excess humus, wetness.	Severe: flooding, wetness, low strength.	Severe: flooding, wetness, low strength.	Severe: wetness, flooding.	Severe: excess salt, excess sulfur, wetness.
Durbin-----------	Severe: excess humus, wetness.	Severe: flooding, wetness, low strength.	Severe: flooding, wetness, low strength.	Severe: wetness, flooding.	Severe: excess salt, wetness, flooding.
24:					
Okeelanta--------	Severe: cutbanks cave, excess humus, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding.	Severe: ponding, excess humus.
Lauderhill-------	Severe: excess humus, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding.	Severe: ponding, excess humus.
Terra Ceia-------	Severe: excess humus, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding.	Severe: ponding, excess humus.
25---------------- Lochloosa	Severe: cutbanks cave.	Slight-----------	Slight-----------	Slight-----------	Slight.
26:					
Williston--------	Moderate: depth to rock, too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Moderate: thin layer.
Pedro------------	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: droughty, thin layer.
Rock outcrop.					
27---------------- Pomello	Severe: cutbanks cave, wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: droughty.
28---------------- Redlevel	Severe: cutbanks cave, wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: droughty.
29---------------- Astatula	Severe: cutbanks cave.	Slight-----------	Slight-----------	Slight-----------	Severe: droughty.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
30---------------- Astatula	Severe: cutbanks cave.	Slight-----------	Moderate: slope.	Slight-----------	Severe: droughty.
31---------------- Sparr	Severe: cutbanks cave, wetness.	Moderate: wetness.	Moderate: wetness, slope.	Moderate: wetness.	Moderate: wetness, droughty.
32:					
Candler----------	Severe: cutbanks cave.	Slight-----------	Moderate: slope.	Slight-----------	Severe: droughty.
Urban land.					
33---------------- Micanopy	Severe: wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Moderate: wetness.
35---------------- Sparr	Severe: cutbanks cave, wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
36---------------- EauGallie	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
37:					
Matlacha---------	Severe: cutbanks cave, wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: too sandy, large stones, small stones.
Urban land.					
38:					
Rock outcrop.					
Homosassa--------	Severe: depth to rock, cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: excess salt, excess sulfur, wetness.
Lacoochee--------	Severe: depth to rock, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: excess salt, wetness, flooding.
39:					
Hallandale-------	Severe: wetness, depth to rock.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, droughty, thin layer.
Rock outcrop.					
40---------------- Homosassa	Severe: depth to rock, cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: excess salt, excess sulfur, wetness.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
41----------------- Candler	Severe: cutbanks cave.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: droughty.
46----------------- EauGallie	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
47----------------- Fort Meade	Severe: cutbanks cave.	Slight-----------	Slight-----------	Slight-----------	Moderate: droughty.
48. Arents					
49:					
Terra Ceia--------	Severe: excess humus, wetness.	Severe: wetness, low strength, flooding.	Severe: wetness, low strength, flooding.	Severe: wetness, low strength, flooding.	Severe: wetness, excess humus, flooding.
Okeelanta---------	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: flooding, excess humus, wetness.
50----------------- Kanapaha	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
51:					
Boca--------------	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
Pineda------------	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
52----------------- Anclote	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
53----------------- Boca	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
54----------------- Apopka	Severe: cutbanks cave.	Slight-----------	Slight-----------	Slight-----------	Severe: droughty.
55. Udorthents					
56----------------- Lake	Severe: cutbanks cave.	Slight-----------	Slight-----------	Slight-----------	Severe: too clayey.
57----------------- Ona	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
58:					
Myakka------------	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
58:					
EauGallie	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
59 Boca	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, droughty.
60 Broward	Severe: cutbanks cave, wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: droughty.
61 Orsino	Severe: cutbanks cave.	Slight	Slight	Slight	Severe: droughty.
62 Malabar	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
63 Paisley	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: low strength, wetness, shrink-swell.	Severe: wetness.
64 Citronelle	Severe: depth to rock, wetness.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.

TABLE 10.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition; 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 Adamsville	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
3*, 4* Candler	Slight	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
5 Basinger	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
6 Basinger	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
7 Myakka	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
8* Paola	Slight	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
9 Pompano	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
10 Pompano	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
11* Tavares	Moderate: wetness.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
12 Immokalee	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
13 Okeelanta	Severe: ponding, poor filter.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
14*, 15* Lake	Slight	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.

TABLE 10.--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
16, 17------------- Arredondo	Slight-----------	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: too sandy.
18, 19------------- Kendrick	Slight-----------	Severe: seepage.	Slight-----------	Severe: seepage.	Good.
20. Pits					
22. Quartzipsamments					
23:					
Weekiwachee--------	Severe: flooding, wetness.	Severe: seepage, flooding, excess humus.	Severe: flooding, depth to rock, seepage.	Severe: flooding, seepage, wetness.	Poor: wetness, excess humus, excess salt.
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.
24:					
Okeelanta----------	Severe: ponding, poor filter.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
Lauderhill---------	Severe: depth to rock, ponding, poor filter.	Severe: seepage, depth to rock, excess humus.	Severe: depth to rock, seepage, ponding.	Severe: depth to rock, seepage, ponding.	Poor: depth to rock, ponding, excess humus.
Terra Ceia---------	Severe: subsides, ponding, poor filter.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus.
25----------------- Lochloosa	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Severe: seepage, wetness.	Fair: wetness.
26:					
Williston----------	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock, seepage.	Poor: area reclaim, too clayey, hard to pack.
Pedro--------------	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock, seepage, too sandy.	Severe: depth to rock, seepage.	Poor: area reclaim, seepage, too sandy.
Rock outcrop.					
27----------------- Pomello	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.

See footnote at end of table.

TABLE 10.--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
28------------------ Redlevel	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: depth to rock, seepage, wetness.	Severe: seepage, wetness.	Poor: seepage, too sandy.
29*, 30*------------ Astatula	Slight-----------	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
31------------------ Sparr	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
32*:					
Candler------------	Slight-----------	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Urban land.					
33------------------ Micanopy	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: wetness, too clayey.	Severe: seepage.	Poor: too clayey, hard to pack.
35------------------ Sparr	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
36------------------ EauGallie	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness, seepage, too sandy.	Severe: wetness, seepage.	Poor: too sandy, wetness, seepage.
37:					
Matlacha-----------	Severe: percs slowly, wetness, poor filter.	Severe: wetness, seepage.	Severe: depth to rock, wetness, too sandy.	Severe: seepage, wetness.	Poor: too sandy, seepage.
Urban land.					
38:					
Rock outcrop.					
Homosassa----------	Severe: flooding, depth to rock, wetness.	Severe: seepage, depth to rock, flooding.	Severe: flooding, depth to rock, seepage.	Severe: flooding, depth to rock, seepage.	Poor: area reclaim, seepage, too sandy.
Lacoochee----------	Severe: flooding, depth to rock, wetness.	Severe: seepage, depth to rock, flooding.	Severe: flooding, depth to rock, seepage.	Severe: flooding, depth to rock, seepage.	Poor: area reclaim, too sandy, wetness.
39:					
Hallandale---------	Severe: depth to rock, wetness.	Severe: seepage, depth to rock, flooding.	Severe: depth to rock, seepage, wetness.	Severe: depth to rock, seepage, wetness.	Poor: area reclaim, seepage, too sandy.

See footnote at end of table.

TABLE 10.--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
39: Rock outcrop.					
40------------------ Homosassa	Severe: flooding, depth to rock, wetness.	Severe: seepage, depth to rock, flooding.	Severe: flooding, depth to rock, seepage.	Severe: flooding, depth to rock, seepage.	Poor: area reclaim, seepage, too sandy.
41*----------------- Candler	Moderate: slope.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
46------------------ EauGallie	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
47*----------------- Fort Meade	Slight-----------	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: too sandy.
48. Arents					
49:					
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.
Okeelanta----------	Severe: flooding, poor filter, wetness.	Severe: seepage, flooding, excess humus.	Severe: seepage, flooding, wetness.	Severe: seepage, flooding, wetness.	Poor: seepage, too sandy, wetness.
50------------------ Kanapaha	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
51:					
Boca---------------	Severe: depth to rock, wetness.	Severe: seepage, depth to rock, wetness.	Severe: depth to rock, wetness, too sandy.	Severe: area reclaim, seepage, too sandy.	Poor: seepage, too sandy, wetness.
Pineda-------------	Severe: wetness, percs slowly, poor filter.	Severe: seepage.	Severe: depth to rock, wetness.	Severe: seepage, wetness.	Poor: wetness, thin layer.
52------------------ Anclote	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
53------------------ Boca	Severe: depth to rock, wetness.	Severe: seepage, depth to rock, wetness.	Severe: depth to rock, wetness, too sandy.	Severe: area reclaim, seepage, too sandy.	Poor: seepage, too sandy, wetness.

See footnote at end of table.

TABLE 10.--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
54 Apopka	Slight	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.
55*. Udorthents					
56 Lake	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
57 Ona	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
58:					
Myakka	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: depth to rock, seepage, wetness.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
EauGallie	Severe: wetness, percs slowly, poor filter.	Severe: seepage, wetness.	Severe: depth to rock, seepage, wetness.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
59 Boca	Severe: depth to rock, ponding, poor filter.	Severe: seepage, depth to rock, ponding.	Severe: depth to rock, ponding, too sandy.	Severe: depth to rock, seepage, ponding.	Poor: depth to rock, seepage, too sandy.
60 Broward	Severe: depth to rock, wetness, poor filter.	Severe: seepage, depth to rock, wetness.	Severe: depth to rock, seepage, wetness.	Severe: depth to rock, seepage, wetness.	Poor: depth to rock, seepage, too sandy.
61 Orsino	Moderate: wetness.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
62 Malabar	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
63 Paisley	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
64 Citronelle	Severe: depth to rock, wetness.	Severe: seepage, depth to rock, wetness.	Severe: depth to rock, seepage, wetness.	Severe: depth to rock, seepage, wetness.	Poor: depth to rock, seepage.

* A dense concentration of these installations may contaminate ground water.

TABLE 11.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
2 Adamsville	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
3, 4 Candler	Good	Probable	Improbable: too sandy.	Poor: too sandy.
5, 6 Basinger	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
7 Myakka	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
8 Paola	Good	Probable	Improbable: too sandy.	Poor: too sandy.
9, 10 Pompano	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
11 Tavares	Good	Probable	Improbable: too sandy.	Poor: too sandy.
12 Immokalee	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
13 Okeelanta	Poor: wetness.	Probable	Improbable: too sandy.	Poor: excess humus, wetness.
14, 15 Lake	Good	Probable	Improbable: too sandy.	Poor: too sandy.
16, 17 Arredondo	Good	Probable	Improbable: too sandy.	Poor: too sandy.
18, 19 Kendrick	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
20. Pits				
22. Quartzipsamments				
23:				
Weekiwachee	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, excess salt, wetness.
Durbin	Poor: wetness.	Probable	Improbable: too sandy.	Poor: excess humus, excess salt, wetness.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
24:				
Okeelanta	Poor: wetness.	Probable	Improbable: too sandy.	Poor: excess humus, wetness.
Lauderhill	Poor: depth to rock, wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.
Terra Ceia	Poor: wetness.	Probable	Improbable: too sandy.	Poor: excess humus, wetness.
25 Lochloosa	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
26:				
Williston	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too sandy, small stones.
Pedro	Poor: area reclaim.	Improbable: thin layer.	Improbable: too sandy.	Poor: area reclaim, too sandy.
Rock outcrop.				
27 Pomello	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
28 Redlevel	Fair: wetness, depth to rock, thin layer.	Probable	Improbable: too sandy.	Poor: too sandy.
29, 30 Astatula	Good	Probable	Improbable: too sandy.	Poor: too sandy.
31 Sparr	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
32:				
Candler	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Urban land.				
33 Micanopy	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
35 Sparr	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
36------ EauGallie	Poor: wetness.	Probable------	Improbable: too sandy.	Poor: too sandy, wetness.
37:				
Matlacha------	Fair: thin layer, area reclaim, wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy, small stones.
Urban land.				
38:				
Rock outcrop.				
Homosassa------	Poor: area reclaim, wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: excess salt, wetness.
Lacoochee------	Poor: area reclaim, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess salt, wetness.
39:				
Hallandale------	Poor: area reclaim, thin layer, wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy, wetness, area reclaim.
Rock outcrop.				
40------ Homosassa	Poor: area reclaim, wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: excess salt, wetness.
41------ Candler	Good------	Probable------	Improbable: too sandy.	Poor: too sandy.
46------ EauGallie	Poor: wetness.	Probable------	Improbable: too sandy.	Poor: too sandy, wetness.
47------ Fort Meade	Good------	Improbable: excess fines.	Improbable: excess fines.	Fair: too sandy, small stones.
48. Arents				
49:				
Terra Ceia------	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
Okeelanta------	Poor: wetness.	Probable------	Improbable: too sandy.	Poor: excess humus, wetness.
50------ Kanapaha	Poor: wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy, wetness.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
51:				
Boca	Poor: thin layer, wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy, wetness.
Pineda	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, wetness.
52 Anclote	Poor: wetness.	Probable	Improbable: too sandy.	Poor: wetness.
53 Boca	Poor: thin layer, wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy, wetness.
54 Apopka	Good	Probable	Improbable: too sandy.	Poor: too sandy.
55. Udorthents				
56 Lake	Good	Probable	Improbable: too sandy.	Poor: too clayey.
57 Ona	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
58:				
Myakka	Poor: wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy, wetness.
EauGallie	Poor: wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy, wetness.
59 Boca	Poor: depth to rock, wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy, wetness.
60 Broward	Poor: depth to rock.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy.
61 Orsino	Good	Probable	Improbable: too sandy.	Poor: too sandy.
62 Malabar	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
63 Paisley	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
64 Citronelle	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock.

TABLE 12.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition; 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
2----------------- Adamsville	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.
3, 4-------------- Candler	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.
5----------------- Basinger	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.
6----------------- Basinger	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, droughty, fast intake.	Ponding, too sandy, soil blowing.
7----------------- Myakka	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.
8----------------- Paola	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.
9----------------- Pompano	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.
10---------------- Pompano	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, droughty, fast intake.	Ponding, too sandy, soil blowing.
11---------------- Tavares	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.
12---------------- Immokalee	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.
13---------------- Okeelanta	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, subsides, cutbanks cave.	Ponding, soil blowing.	Ponding, too sandy, soil blowing.
14, 15------------ Lake	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.

TABLE 12.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Limitations for-- Aquifer-fed excavated ponds	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions
16, 17. Arredondo	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.
18, 19. Kendrick	Severe: seepage.	Slight	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Soil blowing.
20. Pits						
22. Quartzipsamments						
23:						
Weekiwachee	Severe: seepage.	Severe: excess humus, wetness, excess salt.	Severe: salty water, cutbanks cave.	Flooding, excess salt, excess sulfur.	Wetness, soil blowing, flooding.	Wetness, soil blowing.
Durbin	Severe: seepage.	Severe: excess humus, wetness, excess salt.	Severe: salty water, cutbanks cave.	Flooding, subsides, excess salt.	Wetness, flooding, excess salt.	Wetness.
24:						
Okeelanta	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, subsides, cutbanks cave.	Ponding, soil blowing.	Ponding, too sandy, soil blowing.
Lauderhill	Severe: seepage.	Severe: excess humus, ponding.	Severe: depth to rock.	Ponding, depth to rock, subsides.	Ponding, soil blowing, depth to rock.	Depth to rock, ponding, soil blowing.
Terra Ceia	Severe: seepage.	Excess humus, ponding.	Severe: cutbanks cave.	Ponding, subsides.	Ponding, soil blowing.	Ponding, soil blowing.
25. Lochloosa	Severe: seepage.	Moderate: wetness.	Severe: cutbanks cave.	Favorable	Wetness, fast intake, soil blowing.	Wetness, soil blowing.
26:						
Williston	Moderate: depth to rock, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Fast intake, soil blowing, depth to rock.	Depth to rock, soil blowing.
Pedro	Severe: depth to rock.	Severe: seepage.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Depth to rock, too sandy, soil blowing.
Rock outcrop.						
27. Pomello	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.
28. Redlevel	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.

TABLE 12.--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
29, 30----------- Astatula	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.
31--------------- Sparr	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Cutbanks cave, slope.	Slope, wetness, droughty.	Wetness, too sandy, soil blowing.
32:						
Candler----------	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.
Urban land.						
33--------------- Micanopy	Moderate: slope.	Severe: hard to pack.	Severe: no water.	Percs slowly, slope.	Wetness, fast intake, soil blowing.	Wetness, soil blowing, percs slowly.
35--------------- Sparr	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.
36--------------- EauGallie	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Fast intake, wetness, droughty.	Wetness, too sandy, soil blowing.
37:						
Matlacha---------	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave, slow refill.	Cutbanks cave	Wetness, droughty, fast intake.	Too sandy, soil blowing, wetness.
Urban land.						
38:						
Rock outcrop.						
Homosassa--------	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: salty water, depth to rock, cutbanks cave.	Wetness, depth to rock, flooding.	Wetness, soil blowing.	Depth to rock, wetness, too sandy.
Lacoochee--------	Moderate: depth to rock.	Severe: seepage, piping, wetness.	Severe: salty water, depth to rock, cutbanks cave.	Wetness, depth to rock, flooding.	Wetness, soil blowing.	Depth to rock, too sandy.
39:						
Hallandale-------	Severe: depth to rock.	Severe: seepage, piping, wetness.	Severe: depth to rock, cutbanks cave.	Depth to rock, cutbanks cave.	Wetness, droughty, fast intake.	Depth to rock, wetness, too sandy.
Rock outcrop.						
40--------------- Homosassa	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: salty water, depth to rock, cutbanks cave.	Wetness, depth to rock, flooding.	Wetness, soil blowing.	Depth to rock, wetness, too sandy.

TABLE 12.--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
41----------------- Candler	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Slope, too sandy, soil blowing.
46----------------- EauGallie	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, droughty, fast intake.	Ponding, too sandy, soil blowing.
47----------------- Fort Meade	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.
48. Arents						
49:						
Terra Ceia--------	Severe: seepage.	Severe: excess humus, wetness.	Slight----------	Flooding, subsides.	Wetness, soil blowing, flooding.	Wetness, soil blowing.
Okeelanta---------	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, subsides, cutbanks cave.	Flooding, wetness, soil blowing.	Wetness, soil blowing, too sandy.
50----------------- Kanapaha	Severe: seepage.	Severe: seepage, wetness.	Severe: slow refill, cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.
51:						
Boca--------------	Severe: seepage.	Severe: seepage, piping, wetness.	Moderate: depth to rock, cutbanks cave.	Depth to rock, cutbanks cave.	Wetness, droughty, fast intake.	Depth to rock, wetness, too sandy.
Pineda------------	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave, slow refill.	Percs slowly---	Wetness, fast intake, droughty.	Wetness, soil blowing, percs slowly.
52----------------- Anclote	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, fast intake, soil blowing.	Ponding, too sandy, soil blowing.
53----------------- Boca	Severe: seepage.	Severe: seepage, piping, wetness.	Moderate: depth to rock, cutbanks cave.	Depth to rock, cutbanks cave.	Wetness, droughty, fast intake.	Depth to rock, wetness, too sandy.
54----------------- Apopka	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.
55. Udorthents						
56----------------- Lake	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Droughty, slow intake, percs slowly.	Too sandy.

TABLE 12.--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
57---------------- Ona	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy.
58: Myakka-----------	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.
EauGallie--------	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: slow refill, cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.
59---------------- Boca	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: depth to rock, cutbanks cave.	Ponding, depth to rock, cutbanks cave.	Ponding, droughty, fast intake.	Depth to rock, ponding, too sandy.
60---------------- Broward	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: depth to rock, cutbanks cave.	Depth to rock, cutbanks cave.	Wetness, droughty, fast intake.	Depth to rock, wetness, too sandy.
61---------------- Orsino	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.
62---------------- Malabar	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.
63---------------- Paisley	Slight---------	Severe: wetness.	Severe: slow refill.	Percs slowly---	Wetness, fast intake, soil blowing.	Wetness, soil blowing, percs slowly.
64---------------- Citronelle	Severe: seepage, depth to rock.	Severe: thin layer, seepage.	Severe: depth to rock.	Depth to rock	Wetness, droughty, fast intake.	Depth to rock, wetness, soil blowing.

TABLE 13.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated. Some soils have Unified classifications and USDA textures that are supplementary to those shown. In general, the dominant classifications and textures are shown]

Map symbol and soil name	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
2---------------- Adamsville	0-7	Fine sand--------	SP-SM	A-3, A-2-4	0	100	100	90-100	5-12	---	NP
	7-80	Fine sand, sand	SP-SM, SP	A-3, A-2-4	0	100	100	90-100	2-12	---	NP
3---------------- Candler	0-72	Fine sand, sand	SP, SP-SM	A-3	0	100	95-100	75-100	2-8	---	NP
	72-80	Sand, fine sand	SP, SP-SM	A-3	0	100	95-100	75-100	2-8	---	NP
4---------------- Candler	0-60	Fine sand, sand	SP, SP-SM	A-3	0	100	95-100	75-100	2-8	---	NP
	60-80	Sand, fine sand	SP, SP-SM	A-3	0	100	95-100	75-100	2-8	---	NP
5---------------- Basinger	0-8	Fine sand--------	SP	A-3	0	100	100	85-100	1-4	---	NP
	8-24	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	85-100	2-12	---	NP
	24-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	85-100	2-12	---	NP
	36-60	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	85-100	2-12	---	NP
6---------------- Basinger	0-19	Fine sand--------	SP	A-3	0	100	100	85-100	1-4	---	NP
	19-31	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	85-100	2-12	---	NP
	31-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	85-100	2-12	---	NP
	42-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	85-100	2-12	---	NP
7---------------- Myakka	0-27	Fine sand, sand	SP, SP-SM	A-3	0	100	100	85-100	2-10	---	NP
	27-55	Sand, fine sand, loamy fine sand.	SM, SP-SM	A-3, A-2-4	0	100	100	85-100	5-20	---	NP
	55-80	Sand, fine sand	SP, SP-SM	A-3	0	100	100	85-100	2-8	---	NP
8---------------- Paola	0-26	Fine sand, sand	SP	A-3	0	100	100	85-100	1-2	---	NP
	26-80	Sand, fine sand	SP	A-3	0	100	100	85-100	1-2	---	NP
	25-80	Sand, fine sand	SP	A-3	0	100	100	80-100	1-4	---	NP
9, 10------------ Pompano	0-80	Fine sand, sand	SP, SP-SM	A-3, A-2-4	0	100	100	75-100	1-12	---	NP
11--------------- Tavares	0-3	Fine sand--------	SP, SP-SM	A-3	0	100	95-100	85-100	2-10	---	NP
	3-80	Sand, fine sand	SP, SP-SM	A-3	0	100	95-100	85-100	2-10	---	NP
12--------------- Immokalee	0-6	Fine sand--------	SP, SP-SM	A-3	0	100	100	70-100	2-10	---	NP
	6-33	Fine sand, sand	SP, SP-SM	A-3	0	100	100	70-100	2-10	---	NP
	33-52	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	100	100	70-100	5-21	---	NP
	52-80	Fine sand, sand	SP, SP-SM	A-3	0	100	100	70-100	2-10	---	NP
13--------------- Okeelanta	0-38	Muck-------------	PT	A-8	0	---	---	---	---	---	---
	38-80	Fine sand, sand, loamy sand.	SP, SP-SM, SM	A-3, A-2-4	0	100	85-100	80-95	2-15	---	NP
14, 15----------- Lake	0-40	Fine sand--------	SP-SM, SM	A-3, A-2-4	0	100	100	85-100	7-25	---	NP
	40-80	Fine sand--------	SP-SM	A-3, A-2-4	0	100	100	85-100	5-12	---	NP

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
16---------------- Arredondo	0-65	Fine sand, sand, loamy fine sand.	SP-SM, SM	A-2-4, A-3	0	95-100	90-100	75-100	5-15	---	NP
	65-80	Fine sandy loam, sandy clay loam, sandy clay.	SC, SM-SC	A-2-4, A-2-6, A-4, A-6	0	95-100	90-100	85-100	25-45	<40	NP-20
17---------------- Arredondo	0-54	Fine sand, sand, loamy fine sand.	SP-SM, SM	A-2-4, A-3	0	95-100	90-100	75-100	5-15	---	NP
	54-57	Loamy sand, loamy fine sand, sandy loam.	SM, SM-SC	A-2-4	0	95-100	90-100	75-100	13-25	<25	NP-7
	57-80	Fine sandy loam, sandy clay loam, sandy clay.	SC, SM-SC	A-2-4, A-2-6, A-4, A-6	0	95-100	90-100	85-100	25-45	<40	NP-20
18---------------- Kendrick	0-21	Fine sand, loamy fine sand.	SP-SM, SM	A-3, A-2-4	0	95-100	90-100	75-100	5-19	---	NP
	21-45	Sandy clay loam, fine sandy loam, sandy loam.	SC, SM-SC	A-2-6, A-2-4, A-6, A-4	0	95-100	90-100	85-100	25-40	20-35	4-18
	45-80	Sandy clay loam, sandy clay.	SC	A-2-6, A-6	0	95-100	90-100	85-100	25-45	25-40	9-20
19---------------- Kendrick	0-26	Fine sand, loamy fine sand.	SP-SM, SM	A-3, A-2-4	0	95-100	90-100	75-100	5-19	---	NP
	26-30	Sandy clay loam, fine sandy loam, sandy loam.	SC, SM-SC	A-2-6, A-2-4, A-6, A-4	0	95-100	90-100	85-100	25-40	20-35	4-18
	30-56	Sandy clay loam, sandy clay.	SC	A-2-6, A-6	0	95-100	90-100	85-100	25-45	25-40	9-20
	56-80	Sandy clay loam, sandy loam.	SC, SM-SC	A-2-6, A-2-4	0	95-100	90-100	85-100	25-35	20-35	4-18
20. Pits											
22. Quartzipsamments											
23: Weekiwachee-----	0-34	Muck-------------	PT	---	---	---	---	---	---	---	---
	34-38	Sand, fine sand	SP-SM	A-2-4, A-3	0	100	100	85-95	5-12	---	NP
	38-41	Weathered bedrock	---	---	---	---	---	---	---	---	---
	41	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Durbin----------	0-80	Muck-------------	PT	---	0	---	---	---	---	---	---
24: Okeelanta-------	0-32	Muck-------------	PT	A-8	0	---	---	---	---	---	---
	32-80	Fine sand, sand, loamy sand.	SP, SP-SM, SM	A-3, A-2-4	0	100	85-100	80-95	2-15	---	NP
Lauderhill------	0-26	Muck-------------	PT	---	0	---	---	---	---	---	---
	26	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Terra Ceia------	0-80	Muck-------------	PT	A-8	---	---	---	---	---	---	---
	65-80	Sand, fine sand, loamy sand.	SP, SP-SM	A-3, A-2-4	0	100	100	80-90	2-12	---	NP

TABLE 13.--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	
25---------------- Lochloosa	0-27	Fine sand, loamy fine sand.	SP-SM, SM	A-2-4, A-3	0	95-100	95-100	90-98	8-20	---	NP
	27-37	Fine sandy loam, sandy loam, loamy sand.	SM, SM-SC	A-2-4	0	95-100	95-100	90-98	18-30	<28	NP-6
	37-48	Sandy clay loam, sandy loam.	SC, SM-SC	A-2, A-4, A-6	0	95-100	95-100	90-98	25-45	25-40	5-18
	48-63	Sandy clay, sandy clay loam.	SC	A-6, A-7	0	95-100	95-100	90-98	40-50	35-45	15-25
	63-80	Sandy clay loam, sandy loam.	SC, SM-SC	A-2, A-4, A-6	0	95-100	95-100	90-98	25-40	25-40	5-18
26: Williston-------	0-14	Loamy fine sand, fine sand.	SM	A-2-4	0	100	100	75-95	15-25	---	NP
	14-24	Sandy clay, clay	SC, CL, CH	A-6, A-7	0	90-100	85-100	75-90	45-60	30-55	18-35
	24	Weathered bedrock	---	---	---	---	---	---	---	---	---
Pedro-----------	0-15	Fine sand, sand	SP-SM	A-3, A-2-4	0-1	100	95-100	90-100	5-12	---	NP
	15-18	Sandy clay loam	SC	A-2, A-4, A-6	0-1	90-100	85-100	80-100	25-40	25-35	8-16
	18	Weathered bedrock	---	---	---	---	---	---	---	---	---
Rock outcrop.											
27---------------- Pomello	0-31	Fine sand, sand	SP, SP-SM	A-3	0	100	100	80-100	1-8	---	NP
	31-52	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	100	100	80-100	6-15	---	NP
	52-80	Sand, fine sand	SP, SP-SM	A-3	0	100	100	80-100	4-10	---	NP
28---------------- Redlevel	0-7	Fine sand--------	SP-SM	A-3	0	100	100	85-100	5-10	---	NP
	7-55	Fine sand--------	SP-SM	A-3	0	100	100	85-100	5-10	---	NP
	55	Weathered bedrock	---	---	---	---	---	---	---	---	---
29---------------- Astatula	0-5	Fine sand--------	SP, SP-SM	A-3	0	100	100	75-99	1-7	---	NP
	5-80	Sand, fine sand	SP, SP-SM	A-3	0	100	100	75-99	1-7	---	NP
30---------------- Astatula	0-2	Fine sand--------	SP, SP-SM	A-3	0	100	100	75-99	1-7	---	NP
	2-80	Sand, fine sand	SP, SP-SM	A-3	0	100	100	75-99	1-7	---	NP
31---------------- Sparr	0-8	Fine sand--------	SP-SM, SM	A-3, A-2-4	0	100	100	75-99	5-14	---	NP
	8-45	Fine sand--------	SP-SM, SM	A-3, A-2-4	0	100	100	75-99	5-14	---	NP
	45-51	Sandy loam, sandy clay loam, fine sandy loam.	SM-SC, SC, SM	A-2-4	0	100	100	75-99	25-35	<30	NP-10
	51-80	Sandy clay, sandy clay loam, sandy loam.	SC, SM-SC	A-2, A-4, A-6	0	100	95-100	75-99	28-50	22-40	5-15
32: Candler---------	0-60	Fine sand, sand	SP, SP-SM	A-3	0	100	95-100	75-100	2-8	---	NP
	60-80	Sand, fine sand	SP, SP-SM	A-3	0	100	95-100	75-100	2-8	---	NP
	95-99	Sandy loam, sandy clay loam.	SM	A-2-4, A-4	0	100	95-100	80-100	20-40	<30	NP-7
Urban land.											

TABLE 13.--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	
33--------------- Micanopy	0-15	Fine sand--------	SM, SP-SM	A-2-4	0	95-100	95-100	90-100	11-25	---	NP
	15-25	Sandy clay, sandy clay loam.	SC	A-2, A-6, A-7	0	95-100	95-100	90-100	30-50	25-45	12-25
	25-55	Sandy clay, clay	CH, MH	A-7	0	95-100	95-100	90-100	51-80	51-75	25-45
	55-63	Sandy clay, sandy clay loam.	CH, SC	A-7, A-6	0	95-100	95-100	90-100	45-55	35-70	17-42
35--------------- Sparr	0-8	Fine sand--------	SP-SM, SM	A-3, A-2-4	0	100	100	75-99	5-14	---	NP
	8-61	Fine sand--------	SP-SM, SM	A-3, A-2-4	0	100	100	75-99	5-14	---	NP
	61-71	Sandy loam, sandy clay loam, fine sandy loam.	SM-SC, SC, SM	A-2-4	0	100	100	75-99	25-35	<30	NP-10
	71-80	Sandy clay, sandy clay loam, sandy loam.	SC, SM-SC	A-2, A-4, A-6	0	100	95-100	75-99	28-50	22-40	5-15
36--------------- EauGallie	0-22	Fine sand, sand	SP, SP-SM	A-3	0	100	100	80-100	2-5	---	NP
	22-53	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	100	100	80-100	5-20	---	NP
	53-80	Sandy loam, fine sandy loam, sandy clay loam.	SM, SM-SC, SC	A-2-4, A-2-6	0	100	100	80-100	20-35	<40	NP-20
37: Matlacha--------	0-42	Gravelly fine sand.	SP-SM	A-3, A-2-4	0-15	70-85	70-85	60-80	5-12	---	NP
	42-60	Fine sand--------	SP, SP-SM	A-3	0	100	100	85-100	2-10	---	NP
	60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Urban land.											
38: Rock outcrop.											
Homosassa-------	0-8	Mucky fine sandy loam.	SM, SM-SC	A-2-4	0	100	100	85-95	13-35	<28	NP-7
	8-21	Fine sand, loamy fine sand.	SP-SM, SM	A-3, A-2-4	0	100	100	85-95	5-25	---	NP
	21	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Lacoochee-------	0-8	Fine sandy loam	SM, SM-SC	A-4	0	100	100	85-95	36-40	<28	NP-7
	8-13	Fine sand, loamy fine sand.	SM	A-2-4	0	100	100	85-95	13-25	---	NP
	13-21	Weathered bedrock	---	---	---	---	---	---	---	---	---
	21	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
39: Hallandale------	0-2	Fine sand--------	SP, SP-SM	A-3	0	100	100	90-100	2-6	---	NP
	2-6	Fine sand, sand	SP, SP-SM	A-3	0	100	100	90-100	2-6	---	NP
	6-8	Fine sand, sand	SP, SP-SM	A-3	0	100	100	90-100	2-6	---	NP
	8-10	Fine sand, sand	SP, SP-SM	A-3	0	100	100	90-100	2-6	---	NP
	10	Weathered bedrock	---	---	---	---	---	---	---	---	---
Rock outcrop.											

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
40---------------- Homosassa	0-10	Mucky fine sandy loam.	SM, SM-SC	A-2-4	0	100	100	85-95	13-35	<28	NP-7
	10-18	Fine sand, loamy fine sand.	SP-SM, SM	A-3, A-2-4	0	100	100	85-95	5-25	---	NP
	18-31	Fine sand, loamy fine sand.	SP-SM, SM	A-3, A-2-4	0	85-95	85-95	75-85	5-25	---	NP
	31-35	Weathered bedrock	---	---	---	---	---	---	---	---	---
	35	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
41---------------- Candler	0-4	Fine sand---------	SP, SP-SM	A-3	0	100	95-100	75-100	2-8	---	NP
	4-67	Sand, fine sand	SP, SP-SM	A-3	0	100	95-100	75-100	2-8	---	NP
	67-80	Sand, fine sand	SP-SM	A-3, A-2-4	0	100	95-100	75-100	5-12	---	NP
46---------------- EauGallie	0-21	Fine sand, sand	SP, SP-SM	A-3	0	100	100	80-100	2-5	---	NP
	21-32	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	100	100	80-100	5-20	---	NP
	32-46	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
	46-80	Sandy loam, fine sandy loam, sandy clay loam.	SM, SM-SC, SC	A-2-4, A-2-6	0	100	100	80-100	20-35	<40	NP-20
47---------------- Fort Meade	0-13	Loamy fine sand, loamy sand.	SM	A-2-4	0	95-100	90-100	80-100	13-25	---	NP
	13-80	Loamy sand, loamy fine sand.	SM	A-2-4	0	95-100	90-100	80-100	13-25	---	NP
48. Arents											
49:											
Terra Ceia-------	0-80	Muck--------------	PT	A-8	---	---	---	---	---	---	---
Okeelanta--------	0-27	Muck--------------	PT	A-8	0	---	---	---	---	---	---
	27-65	Fine sand, sand, loamy sand.	SP, SP-SM, SM	A-3, A-2-4	0	100	85-100	80-95	2-15	---	NP
50---------------- Kanapaha	0-45	Fine sand---------	SP-SM	A-3, A-2-4	0	95-100	90-100	75-95	5-12	---	NP
	45-72	Sandy loam, sandy clay loam.	SM-SC, SC	A-2-4	0	95-100	90-100	80-95	20-35	20-30	4-10
51:											
Boca-------------	0-3	Fine sand---------	SP, SP-SM	A-3, A-2-4	0	100	100	80-99	2-12	---	NP
	3-22	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-99	2-12	---	NP
	22-32	Sandy loam, sandy clay loam, fine sandy loam.	SC	A-2-4, A-6, A-2-6	0	100	100	80-99	17-40	16-37	5-20
	32	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Pineda-----------	0-28	Fine sand, sand	SP, SP-SM	A-3	0	100	100	85-100	2-10	---	NP
	28-42	Fine sandy loam, sandy clay loam.	SM, SM-SC, SC	A-2-4, A-2-6	0	100	100	65-85	13-35	<30	NP-15
	42	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

TABLE 13.--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	
52---------------- Anclote	0-14	Fine sand--------	SP, 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	A-3, A-2-4	0	100	95-100	85-100	2-20	---	NP
53---------------- Boca	0-5	Fine sand--------	SP, SP-SM	A-3, A-2-4	0	100	100	80-99	2-12	---	NP
	5-21	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-99	2-12	---	NP
	21-38	Sandy loam, sandy clay loam, fine sandy loam.	SC	A-2-4, A-6, A-2-6	0	100	100	80-99	17-40	16-37	5-20
	38	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
54---------------- Apopka	0-50	Fine sand, sand	SP, SP-SM	A-3	0	100	100	85-100	3-10	---	NP
	50-80	Sandy loam, sandy clay loam.	SM-SC, SC	A-2-4, A-2-6, A-4, A-6	0	98-100	95-100	60-95	20-40	20-40	4-20
55. Udorthents											
56---------------- Lake	0-11	Clay-------------	CH	A-7	0	100	100	95-100	80-95	45-70	30-50
	11-51	Fine sand--------	SP-SM, SM	A-3, A-2-4	0	100	100	85-100	7-25	---	NP
	51-80	Fine sand--------	SP-SM	A-3, A-2-4	0	100	100	85-100	5-12	---	NP
57---------------- Ona	0-8	Fine sand--------	SP-SM, SP	A-3	0	100	100	85-95	3-10	---	NP
	8-20	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	100	100	85-95	5-20	---	NP
	20-80	Fine sand, sand	SP-SM, SP	A-3	0	100	100	85-95	3-10	---	NP
58: Myakka-----------	0-23	Fine sand, sand	SP, SP-SM	A-3	0	100	100	85-100	2-10	---	NP
	23-34	Sand, fine sand, loamy fine sand.	SM, SP-SM	A-3, A-2-4	0	100	100	85-100	5-20	---	NP
	34-62	Sand, fine sand	SP, SP-SM	A-3	0	100	100	85-100	2-8	---	NP
	62	Weathered bedrock	---	---	---	---	---	---	---	---	---
EauGallie--------	0-25	Fine sand, sand	SP, SP-SM	A-3	0	100	100	80-98	2-5	---	NP
	25-33	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	100	100	80-98	5-20	---	NP
	33-57	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-98	2-12	---	NP
	57-63	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
	63	Weathered bedrock	---	---	---	---	---	---	---	---	---
59---------------- Boca	0-8	Fine sand--------	SP, SP-SM	A-3, A-2-4	0	100	100	80-99	2-12	---	NP
	8-21	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-99	2-12	---	NP
	21-27	Sandy loam, fine sandy loam, sandy clay loam.	SM-SC, SC	A-2-4, A-6, A-2-6, A-4	0	100	100	80-99	25-40	16-37	6-20
	27	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

TABLE 13.--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	
60--------------- Broward	0-5	Fine sand--------	SP-SM	A-3, A-2-4	0	100	100	85-100	5-12	---	NP
	5-35	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	85-100	2-12	---	NP
	26	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
61--------------- Orsino	0-14	Fine sand--------	SP	A-3	0	100	100	85-95	1-3	---	NP
	14-80	Sand, fine sand	SP, SP-SM	A-3	0	100	100	85-100	2-10	---	NP
62--------------- Malabar	0-15	Sand, fine sand	SP, SP-SM	A-3	0	100	100	80-100	2-10	---	NP
	15-44	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	3-12	---	NP
	44-80	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
63--------------- Paisley	0-15	Fine sand, loamy fine sand.	SP-SM	A-3, A-2-4	0	100	100	80-99	5-12	---	NP
	15-80	Sandy clay, clay	CH, CL	A-7	0	95-100	90-100	75-95	51-70	41-51	25-35
64--------------- Citronelle	0-2	Fine sand--------	SP-SM, SP	A-3	0-15	95-100	95-100	90-100	2-10	---	NP
	2-9	Fine sand, sand	SP-SM	A-3, A-2-4	0-15	95-100	95-100	90-100	5-12	---	NP
	9	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH	mmho/cm					Pct
2---------------- Adamsville	0-7	1-8	1.35-1.65	6.0-20	0.05-0.10	4.5-7.8	<2	Low--------	0.10	5	2	<2
	7-80	1-7	1.35-1.65	6.0-20	0.03-0.08	4.5-7.8	<2	Low--------	0.10			
3---------------- Candler	0-72	<3	1.35-1.55	6.0-20	0.04-0.08	4.5-6.0	<2	Low--------	0.10	5	2	.5-2
	72-80	<3	1.50-1.65	6.0-20	0.02-0.06	4.5-6.0	<2	Low--------	0.10			
4---------------- Candler	0-60	<3	1.35-1.55	6.0-20	0.04-0.08	4.5-6.0	<2	Low--------	0.10	5	2	.5-2
	60-80	<3	1.50-1.65	6.0-20	0.02-0.06	4.5-6.0	<2	Low--------	0.10			
5---------------- Basinger	0-8	0-4	1.40-1.55	6.0-20	0.03-0.07	3.6-8.4	<2	Low--------	0.10	5	2	.5-2
	8-24	0-4	1.40-1.55	6.0-20	0.05-0.10	3.6-7.3	<2	Low--------	0.10			
	24-80	1-6	1.40-1.65	6.0-20	0.10-0.15	3.6-7.3	<2	Low--------	0.10			
	36-60	1-3	1.50-1.70	6.0-20	0.05-0.10	3.6-7.3	<2	Low--------	0.10			
6---------------- Basinger	0-19	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
	19-31	0-4	1.40-1.55	6.0-20	0.05-0.10	3.6-7.3	<2	Low--------	0.10			
	31-80	1-3	1.40-1.65	6.0-20	0.10-0.15	3.6-7.3	<2	Low--------	0.10			
	42-80	1-3	1.50-1.70	6.0-20	0.05-0.10	3.6-7.3	<2	Low--------	0.10			
7---------------- Myakka	0-27	<2	1.35-1.55	6.0-20	0.02-0.05	3.6-6.5	<2	Low--------	0.10	5	2	<2
	27-55	1-8	1.45-1.60	0.6-6.0	0.10-0.20	3.6-6.5	<2	Low--------	0.15			
	55-80	<2	1.48-1.70	6.0-20	0.02-0.10	3.6-6.5	<2	Low--------	0.10			
8---------------- Paola	0-26	0-2	1.20-1.45	>20	0.02-0.05	3.6-7.3	<2	Low--------	0.10	5	1	<.5
	26-80	0-2	1.45-1.60	>20	0.02-0.05	3.6-7.3	<2	Low--------	0.10			
	25-80	0-3	1.45-1.60	>20	0.02-0.05	3.6-7.3	<2	Low--------	0.10			
9, 10------------ 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
11--------------- Tavares	0-3	0-4	1.25-1.60	>6.0	0.05-0.10	3.6-6.0	<2	Low--------	0.10	5	2	.5-2
	3-80	0-4	1.40-1.70	>6.0	0.02-0.05	3.6-6.0	<2	Low--------	0.10			
12--------------- Immokalee	0-6	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
	6-33	1-5	1.45-1.70	6.0-20	0.02-0.05	3.6-6.0	<2	Low--------	0.10			
	33-52	2-7	1.30-1.60	0.6-2.0	0.10-0.25	3.6-6.0	<2	Low--------	0.15			
	52-80	1-5	1.40-1.60	6.0-20	0.02-0.05	3.6-6.0	<2	Low--------	0.10			
13--------------- Okeelanta	0-38	---	0.22-0.38	6.0-20	0.30-0.50	4.5-6.5	<2	Low--------	----	---	2	60-90
	38-80	1-5	1.30-1.55	6.0-20	0.05-0.10	5.1-7.8	<2	Low--------	0.15			
14, 15----------- Lake	0-80	1-3	1.45-1.65	>6.0	0.03-0.08	4.5-5.5	<2	Low--------	0.10	5	2	.5-1
16--------------- Arredondo	0-65	5-12	1.25-1.65	6.0-20	0.05-0.10	4.5-6.0	<2	Low--------	0.10	5	2	<2
	65-80	15-40	1.55-1.70	0.04-0.6	0.15-0.20	4.5-6.0	<2	Low--------	0.24			
17--------------- Arredondo	0-54	5-12	1.25-1.65	6.0-20	0.05-0.10	4.5-6.0	<2	Low--------	0.10	5	2	<2
	54-57	10-18	1.45-1.60	2.0-6.0	0.08-0.15	4.5-6.0	<2	Low--------	0.20			
	57-80	15-40	1.55-1.70	0.04-0.6	0.15-0.20	4.5-6.0	<2	Low--------	0.24			
18--------------- Kendrick	0-21	1-7	1.25-1.50	6.0-20	0.05-0.07	4.5-6.0	<2	Low--------	0.10	5	2	<2
	21-45	15-25	1.55-1.70	0.6-6.0	0.10-0.15	4.5-6.0	<2	Low--------	0.24			
	45-80	20-40	1.55-1.75	0.06-2.0	0.12-0.20	4.5-6.0	<2	Low--------	0.32			

TABLE 14.--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	mmho/cm					Pct
19-------------- Kendrick	0-26	1-7	1.25-1.50	6.0-20	0.05-0.07	4.5-6.0	<2	Low-------	0.10	5	2	<2
	26-30	15-25	1.55-1.70	0.6-6.0	0.10-0.15	4.5-6.0	<2	Low-------	0.24			
	30-56	20-40	1.55-1.75	0.06-2.0	0.12-0.20	4.5-6.0	<2	Low-------	0.32			
	56-80	15-25	1.55-1.75	<0.0-2.0	0.12-0.15	4.5-6.0	<2	Low-------	0.32			
20*. Pits												
22. Quartzipsamments												
23:												
Weekiwachee-----	0-34	---	0.25-0.35	2.0-6.0	0.20-0.25	6.1-7.8	>16	Low-------	----	---	2	20-74
	34-38	1-7	1.50-1.65	2.0-6.0	0.10-0.15	6.1-7.8	>16	Low-------	0.10			
	38-41	---	---	---	---	---	---	----------	----			
	41	---	---	---	---	---	---	----------	----			
Durbin----------	0-80	---	0.20-0.50	6.0-20	0.20-0.25	3.6-7.3	>16	Low-------	----	2	2	40-65
24:												
Okeelanta-------	0-32	---	0.22-0.38	6.0-20	0.30-0.50	4.5-6.5	<2	Low-------	----	---	2	60-90
	32-80	1-5	1.30-1.55	6.0-20	0.05-0.10	5.1-7.8	<2	Low-------	0.15			
Lauderhill------	0-26	---	0.15-0.35	6.0-20	0.30-0.50	5.6-7.8	<2	Low-------	----	---	2	60-90
	26	---	---	---	---	---	---	----------	----			
Terra Ceia------	0-80	---	0.15-0.35	6.0-20	0.30-0.50	4.5-8.4	<2	Low-------	----	---	2	60-90
	65-80	2-10	1.35-1.50	6.0-20	0.02-0.08	4.5-8.4	<2	Low-------	----			
25-------------- Lochloosa	0-27	2-12	1.35-1.65	2.0-20	0.05-0.20	4.5-5.5	<2	Low-------	0.10	5	2	1-4
	27-37	13-20	1.55-1.70	0.6-6.0	0.10-0.15	4.5-5.5	<2	Low-------	0.24			
	37-48	15-35	1.55-1.70	0.6-0.2	0.12-0.15	4.5-5.5	<2	Low-------	0.28			
	48-63	20-45	1.60-1.70	0.06-0.2	0.13-0.18	4.5-5.5	<2	Low-------	0.28			
	63-80	15-35	1.55-1.70	0.06-0.2	0.10-0.15	4.5-5.5	<2	Low-------	0.28			
26:												
Williston-------	0-14	10-14	1.30-1.45	6.0-20	0.08-0.10	5.1-7.3	<2	Low-------	0.15	2	2	0-2
	14-24	35-55	1.60-1.70	0.2-0.6	0.14-0.18	6.1-7.8	<2	Moderate	0.28			
	24	---	---	---	---	---	---	----------	----			
Pedro-----------	0-15	1-5	1.36-1.55	6.0-20	0.03-0.08	5.1-6.5	<2	Low-------	0.10	1	2	.5-2
	15-18	20-35	1.55-1.70	2.0-6.0	0.10-0.15	6.1-7.8	<2	Low-------	0.28			
	18	---	---	---	---	---	---	----------	----			
Rock outcrop.												
27-------------- Pomello	0-31	<2	1.35-1.65	>20	0.02-0.05	4.5-6.0	<2	Very low	0.10	5	1	<1
	31-52	<2	1.45-1.60	2.0-6.0	0.10-0.30	4.5-6.0	<2	Very low	0.15			
	52-80	<2	1.35-1.65	6.0-20	0.02-0.05	4.5-6.0	<2	Very low	0.10			
28-------------- Redlevel	0-7	1-2	1.30-1.50	6.0-20	0.05-0.10	4.5-8.4	<2	Low-------	0.10	4	2	.5-2
	7-55	2-7	1.50-1.60	6.0-20	0.05-0.10	4.5-8.4	<2	Low-------	0.10			
	55	---	---	---	---	---	---	----------	----			
29-------------- Astatula	0-5	1-3	1.25-1.50	>20	0.04-0.10	4.5-6.5	<2	Low-------	0.10	5	2	.5-2
	5-80	1-3	1.45-1.60	>20	0.02-0.05	4.5-6.5	<2	Low-------	0.10			
30-------------- Astatula	0-2	1-3	1.25-1.50	>20	0.04-0.10	4.5-6.5	<2	Low-------	0.10	5	2	.5-2
	2-80	1-3	1.45-1.60	>20	0.02-0.05	4.5-6.5	<2	Low-------	0.10			

TABLE 14.--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	mmho/cm					Pct
31 Sparr	0-8	1-5	1.20-1.50	6.0-20	0.08-0.12	3.6-6.5	<2	Low	0.10	5	2	<3
	8-45	1-5	1.45-1.70	6.0-20	0.05-0.08	3.6-6.5	<2	Low	0.10			
	45-51	15-32	1.55-1.80	0.6-2.0	0.10-0.15	3.6-6.5	<2	Low	0.20			
	51-80	12-38	1.55-1.80	0.06-0.6	0.10-0.18	3.6-6.5	<2	Low	0.24			
32:												
Candler	0-60	<3	1.35-1.55	6.0-20	0.04-0.08	4.5-6.0	<2	Low	0.10	5	2	.5-2
	60-80	<3	1.50-1.65	6.0-20	0.02-0.06	4.5-6.0	<2	Low	0.10			
	95-99	14-30	1.55-1.65	2.0-6.0	0.10-0.15	4.5-6.0	<2	Low	0.20			
Urban land.												
33 Micanopy	0-15	3-12	1.50-1.65	6.0-20	0.05-0.10	3.6-6.0	<2	Low	0.15	5	2	1-5
	15-25	20-38	1.50-1.65	0.6-2.0	0.10-0.15	3.6-6.0	<2	Moderate	0.32			
	25-55	40-60	1.55-1.70	0.06-0.2	0.10-0.18	3.6-6.0	<2	High	0.28			
	55-63	25-38	1.55-1.70	0.06-0.2	0.10-0.15	3.6-6.0	<2	High	0.32			
35 Sparr	0-8	1-5	1.20-1.50	6.0-20	0.08-0.12	3.6-6.5	<2	Low	0.10	5	2	<3
	8-61	1-5	1.45-1.70	6.0-20	0.05-0.08	3.6-6.5	<2	Low	0.10			
	61-71	15-32	1.55-1.80	0.6-2.0	0.10-0.15	3.6-6.5	<2	Low	0.20			
	71-80	12-38	1.55-1.80	0.06-0.6	0.10-0.18	3.6-6.5	<2	Low	0.24			
36 EauGallie	0-22	<5	1.25-1.50	6.0-20	0.02-0.07	4.5-6.0	<2	Low	0.10	5	2	2-8
	22-53	1-8	1.45-1.60	0.6-6.0	0.15-0.25	4.5-6.5	<2	Low	0.15			
	53-80	13-31	1.55-1.70	0.06-2.0	0.10-0.20	4.5-7.8	<2	Low	0.20			
37:												
Matlacha	0-42	3-8	1.65-1.75	2.0-6.0	0.05-0.10	5.6-8.4	<2	Low	0.10	5	2	---
	42-60	1-2	1.40-1.65	6.0-20	0.03-0.05	5.6-7.3	<2	Low	0.17			
	60	---	---	---	---	---	---	---	---			
Urban land.												
38:												
Rock outcrop.												
Homosassa	0-8	10-18	1.25-1.45	2.0-20	0.20-0.25	6.1-7.8	>16	Low	0.10	2	2	10-15
	8-21	3-12	1.45-1.60	2.0-20	0.10-0.15	6.1-7.8	>16	Low	0.17			
	21	---	---	---	---	---	---	---	---			
Lacoochee	0-8	13-19	1.55-1.65	0.6-2.0	0.15-0.20	7.9-8.4	>16	Low	0.20	1	3	---
	8-13	3-12	1.50-1.65	2.0-6.0	0.10-0.15	6.6-8.4	>16	Low	0.17			
	13-21	---	---	---	---	---	---	---	---			
	21	---	---	---	---	---	---	---	---			
39:												
Hallandale	0-2	<3	1.35-1.45	6.0-20	0.05-0.11	5.1-6.5	<2	Low	0.10	2	2	2-5
	2-6	<3	1.50-1.60	6.0-20	0.03-0.08	6.1-6.5	<2	Low	0.10			
	6-8	<3	1.50-1.60	0.6-6.0	0.03-0.08	5.6-8.4	<2	Low	0.10			
	8-10	<5	1.50-1.60	6.0-20	0.05-0.10	6.6-8.4	<2	Low	0.10			
	10	---	---	---	---	---	---	---	---			
Rock outcrop.												
40 Homosassa	0-10	10-18	1.25-1.45	2.0-20	0.20-0.25	6.1-7.8	>16	Low	0.10	2	2	10-15
	10-18	3-12	1.45-1.60	2.0-20	0.10-0.15	6.1-7.8	>16	Low	0.17			
	18-31	3-12	---	2.0-20	0.07-0.12	6.1-7.8	>16	Low	0.17			
	31-35	---	---	---	---	---	---	---	---			
	35	---	---	---	---	---	---	---	---			

TABLE 14.--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	mmho/cm					Pct
41----------------- Candler	0-4	<3	1.35-1.55	6.0-20	0.04-0.08	4.5-6.0	<2	Low--------	0.10	5	2	.5-2
	4-67	<3	1.50-1.65	6.0-20	0.02-0.06	4.5-6.0	<2	Low--------	0.10			
	67-80	3-8	1.50-1.65	6.0-20	0.05-0.08	4.5-6.0	<2	Low--------	0.10			
46----------------- EauGallie	0-21	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
	21-32	1-8	1.45-1.60	0.6-6.0	0.15-0.25	4.5-6.5	<2	Low--------	0.15			
	32-46	1-5	1.45-1.65	6.0-20	0.02-0.05	4.5-7.8	<2	Low--------	0.10			
	46-80	13-31	1.55-1.70	0.06-2.0	0.10-0.20	4.5-7.8	<2	Low--------	0.20			
47----------------- Fort Meade	0-13	3-13	1.15-1.55	6.0-20	0.08-0.15	5.1-7.3	<2	Low--------	0.15	5	2	1-5
	13-80	3-13	1.20-1.65	6.0-20	0.06-0.10	4.5-6.0	<2	Low--------	0.15			
48. Arents												
49:												
Terra Ceia-------	0-80	---	0.15-0.35	6.0-20	0.30-0.50	4.5-8.4	<2	Low--------	----	2	2	>60
Okeelanta--------	0-27	---	0.15-0.35	6.0-20	0.20-0.45	6.6-7.3	<2	Low--------	----	---	2	60-85
	27-65	1-5	1.30-1.55	6.0-20	0.05-0.10	6.6-8.4	<2	Low--------	0.10			
50----------------- Kanapaha	0-45	2-6	1.55-1.75	2.0-6.0	0.03-0.10	4.5-6.0	<2	Low--------	0.10	5	2	.5-4
	45-72	15-32	1.50-1.65	0.06-0.6	0.10-0.15	4.5-6.0	<2	Low--------	0.24			
51:												
Boca-------------	0-3	<2	1.30-1.55	6.0-20	0.05-0.10	5.1-8.4	<2	Low--------	0.10	5	2	1-3
	3-22	<2	1.50-1.60	6.0-20	0.02-0.05	5.1-8.4	<2	Low--------	0.17			
	22-32	14-30	1.55-1.65	0.6-2.0	0.10-0.15	5.1-8.4	<2	Low--------	0.20			
	32	---	---	---	---	---	---	-----------	----			
Pineda-----------	0-28	1-3	1.40-1.65	6.0-20	0.02-0.05	5.6-6.5	<2	Low--------	0.15	5	2	1-2
	28-42	17-35	1.65-1.75	0.06-0.2	0.10-0.15	6.6-7.8	<2	Low--------	0.24			
	42	---	---	---	---	---	---	-----------	----			
52----------------- 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			
53----------------- Boca	0-5	<2	1.30-1.55	6.0-20	0.05-0.10	5.1-8.4	<2	Low--------	0.10	5	2	1-3
	5-21	<2	1.50-1.60	6.0-20	0.02-0.05	5.1-8.4	<2	Low--------	0.17			
	21-38	14-30	1.55-1.65	0.6-2.0	0.10-0.15	5.1-8.4	<2	Low--------	0.20			
	38	---	---	---	---	---	---	-----------	----			
54----------------- Apopka	0-50	<3	1.45-1.60	6.0-20	0.03-0.05	4.5-6.0	<2	Low--------	0.10	5	2	<2
	50-80	18-35	1.55-1.75	0.6-2.0	0.12-0.17	4.5-6.0	<2	Low--------	0.24			
55. Udorthents												
56----------------- Lake	0-11	35-75	1.45-1.65	0.06-0.2	0.15-0.20	4.5-7.8	<2	High-------	0.32	5	4	---
	11-80	1-3	1.45-1.65	>6.0	0.03-0.08	4.5-5.5	<2	Low--------	0.10			
57----------------- Ona	0-8	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
	8-20	3-8	1.50-1.65	0.6-2.0	0.10-0.15	3.6-6.0	<2	Low--------	0.15			
	20-80	1-4	1.50-1.65	6.0-20	0.03-0.08	3.6-6.0	<2	Low--------	0.10			
58:												
Myakka-----------	0-23	0-2	1.35-1.55	6.0-20	0.02-0.05	5.1-7.8	<2	Low--------	0.10	5	2	<2
	23-34	1-8	1.45-1.60	0.6-6.0	0.10-0.20	5.1-7.8	<2	Low--------	0.15			
	34-62	0-2	1.48-1.70	6.0-20	0.10-0.20	5.1-7.8	<2	Low--------	0.10			
	62	---	---	---	---	---	---	-----------	----			

TABLE 14.--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		Wind erodi-bility group	Organic matter
									K	T		
	In	Pct	G/cc	In/hr	In/in	pH	mmho/cm					Pct
58:												
EauGallie-------	0-25	<5	1.25-1.50	6.0-20	0.02-0.05	4.5-6.0	<2	Low-------	0.10	5	2	2-8
	25-33	1-8	1.45-1.60	0.6-6.0	0.05-0.10	4.5-6.5	<2	Low-------	0.15			
	33-57	1-5	1.45-1.65	6.0-20	0.02-0.05	5.1-7.8	<2	Low-------	0.10			
	57-63	13-31	1.55-1.70	0.2-6.0	0.10-0.15	5.1-7.8	<2	Low-------	0.20			
	63	---	---	---	---	---	---	----------	----			
59--------------- Boca	0-8	0-2	1.30-1.55	6.0-20	0.05-0.10	5.1-7.8	<2	Low-------	0.10	5	2	1-3
	8-21	0-2	1.50-1.60	6.0-20	0.02-0.05	5.1-8.4	<2	Low-------	0.10			
	21-27	15-30	1.55-1.65	0.6-2.0	0.10-0.15	5.1-8.4	<2	Low-------	0.20			
	27	---	---	---	---	---	---	----------	----			
60--------------- Broward	0-5	2-8	1.35-1.45	6.0-20	0.05-0.10	5.6-8.4	<2	Low-------	0.10	2	2	<1
	5-35	1-7	1.50-1.60	6.0-20	0.03-0.08	5.6-8.4	<2	Low-------	0.10			
	26	---	---	---	---	---	---	----------	----			
61--------------- Orsino	0-14	<1	1.35-1.55	>20	0.02-0.08	3.6-6.0	<2	Low-------	0.10	5	2	<1
	14-80	<2	1.35-1.55	>20	0.02-0.08	3.6-6.0	<2	Low-------	0.10			
62--------------- Malabar	0-15	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
	15-44	1-5	1.35-1.70	6.0-20	0.05-0.10	5.1-8.4	<2	Low-------	0.10			
	44-80	12-25	1.55-1.75	<0.2	0.10-0.15	5.1-8.4	<2	Low-------	0.24			
63--------------- Paisley	0-15	2-8	1.35-1.45	6.0-20	0.05-0.08	4.5-6.5	<2	Low-------	0.10	5	2	1-4
	15-80	45-65	1.55-1.65	0.06-0.2	0.15-0.18	5.6-8.4	<2	High------	0.28			
64--------------- Citronelle	0-2	1-2	1.30-1.50	0.6-6.0	0.05-0.10	5.1-8.4	<2	Low-------	0.10	4	2	.5-2
	2-9	2-5	1.50-1.60	0.6-6.0	0.05-0.10	5.1-8.4	<2	Low-------	0.10			
	9	---	---	---	---	---	---	----------	----			

TABLE 15.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Map symbol and soil name	Hydro-logic group	Flooding			High water table			Bedrock		Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hard-ness	Ini-tial	Total	Uncoated steel	Concrete
					Ft			In		In	In		
2----------------- Adamsville	C	None---------	---	---	2.0-3.5	Apparent	Jun-Nov	>60	---	---	---	Low-------	Moderate.
3, 4-------------- Candler	A	None---------	---	---	>6.0	---	---	>60	---	---	---	Low-------	High.
5----------------- Basinger	B/D	None---------	---	---	0-1.0	Apparent	Jun-Feb	>60	---	---	---	High------	Moderate.
6*---------------- Basinger	D	None---------	---	---	+2-1.0	Apparent	Jun-Feb	>60	---	---	---	High------	Moderate.
7----------------- Myakka	B/D	None---------	---	---	0-1.0	Apparent	Jun-Nov	>60	---	---	---	High------	High.
8----------------- Paola	A	None---------	---	---	>6.0	---	---	>60	---	---	---	Low-------	High.
9----------------- Pompano	B/D	None---------	---	---	0-1.0	Apparent	Jun-Nov	>60	---	---	---	High------	Moderate.
10*--------------- Pompano	D	None---------	---	---	+2-1.0	Apparent	Jun-Feb	>60	---	---	---	High------	Moderate.
11---------------- Tavares	A	None---------	---	---	3.5-6.0	Apparent	Jun-Dec	>60	---	---	---	Low-------	High.
12---------------- Immokalee	B/D	None---------	---	---	0-1.0	Apparent	Jun-Nov	>60	---	---	---	High------	High.
13*--------------- Okeelanta	B/D	None---------	---	---	+1-0	Apparent	Jun-Jan	>60	---	16-20	16-30	High------	Moderate.
14, 15------------ Lake	A	None---------	---	---	>6.0	---	---	>60	---	---	---	Low-------	High.
16, 17------------ Arredondo	A	None---------	---	---	>6.0	---	---	>60	---	---	---	Moderate	High.
18, 19------------ Kendrick	A	None---------	---	---	>6.0	---	---	>60	---	---	---	Moderate	High.

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES--Continued

Map symbol and soil name	Hydro-logic group	Flooding			High water table			Bedrock		Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hard-ness	Ini-tial	Total	Uncoated steel	Concrete
					Ft			In		In	In		
20. Pits													
22. Quartzipsamments													
23:													
Weekiwachee------	D	Frequent----	Very long	Jan-Dec	0-0.5	Apparent	Jan-Dec	40-51	Hard	---	---	High-----	Low.
Durbin-----------	D	Frequent----	Very long	Jan-Dec	0-0.5	Apparent	Jan-Dec	>60	---	12-14	15-24	High-----	High.
24*:													
Okeelanta--------	B/D	None--------	---	---	+1-0	Apparent	Jun-Jan	>60	---	16-20	16-30	High-----	Moderate.
Lauderhill-------	B/D	None--------	---	---	+1-1.0	Apparent	Jun-Feb	20-40	Hard	8-12	16-36	High-----	Moderate.
Terra Ceia-------	B/D	None--------	---	---	+1-1.0	Apparent	Jan-Dec	>60	---	16-20	50-60	Moderate	Moderate.
25---------------- Lochloosa	C	None--------	---	---	2.5-5.0	Apparent	Jul-Oct	>60	---	---	---	High-----	High.
26:													
Williston--------	C	None--------	---	---	>6.0	---	---	20-40	Hard	---	---	High-----	Moderate.
Pedro------------	C	None--------	---	---	>6.0	---	---	10-30	Hard	---	---	Moderate	Moderate.
Rock outcrop.													
27---------------- Pomello	C	None--------	---	---	2.0-3.5	Apparent	Jul-Nov	>60	---	---	---	Low------	High.
28---------------- Redlevel	C	None--------	---	---	2.0-3.0	Apparent	Jun-Nov	40-60	Hard	---	---	High-----	High.
29, 30------------ Astatula	A	None--------	---	---	>6.0	---	---	>60	---	---	---	Low------	High.
31---------------- Sparr	C	None--------	---	---	1.5-3.5	Apparent	Jul-Oct	>60	---	---	---	Moderate	High.

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES--Continued

Map symbol and soil name	Hydro-logic group	Flooding			High water table			Bedrock		Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hard-ness	Ini-tial	Total	Uncoated steel	Concrete
					Ft			In		In	In		
32:													
Candler	A	None	---	---	>6.0	---	---	>60	---	---	---	Low	High.
Urban land.													
33 Micanopy	C	None	---	---	1.5-2.5	Perched	Jul-Nov	>60	---	---	---	High	High.
35 Sparr	C	None	---	---	1.5-3.5	Apparent	Jul-Oct	>60	---	---	---	Moderate	High.
36 EauGallie	B/D	None	---	---	0-1.0	Apparent	Jun-Oct	>60	---	---	---	High	Moderate.
37:													
Matlacha	C	None	---	---	2.0-3.0	Apparent	Jun-Oct	40-60	Hard	---	---	High	Low.
Urban land.													
38:													
Rock outcrop.													
Homosassa	D	Frequent	Very long	Jan-Dec	0-0.5	Apparent	Jan-Dec	23-40	Hard	---	---	High	Low.
Lacoochee	D	Frequent	Very long	Jan-Dec	0-0.5	Apparent	Jan-Dec	20-40	Hard	---	---	High	Low.
39:													
Hallandale	B/D	Rare	---	---	0-1.0	Apparent	Jun-Nov	7-20	Hard	---	---	High	Low.
Rock outcrop.													
40 Homosassa	D	Frequent	Very long	Jan-Dec	0-0.5	Apparent	Jan-Dec	23-40	Hard	---	---	High	Low.
41 Candler	A	None	---	---	>6.0	---	---	>60	---	---	---	Low	High.
46* EauGallie	D	None	---	---	+2-1.0	Apparent	Jun-Feb	>60	---	---	---	High	Moderate.
47 Fort Meade	A	None	---	---	>6.0	---	---	>60	---	---	---	Low	High.
48. Arents													

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES--Continued

Map symbol and soil name	Hydro-logic group	Flooding			High water table			Bedrock		Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hard-ness	Ini-tial	Total	Uncoated steel	Concrete
					Ft			In		In	In		
49:													
Terra Ceia-------	D	Frequent----	Long------	Jun-Nov	0-1.0	Apparent	Jan-Dec	>60	---	16-20	50-60	Moderate	Moderate.
Okeelanta--------	D	Frequent----	Very long	Mar-Sep	0-1.0	Apparent	Jan-Dec	>60	---	4-8	10-18	High-----	Moderate.
50---------------- Kanapaha	B/D	None--------	---	---	0-1.0	Apparent	Jul-Sep	>60	---	---	---	High-----	High.
51:													
Boca-------------	B/D	None--------	---	---	0-1.0	Apparent	Jun-Feb	24-40	Hard	---	---	High-----	Moderate.
Pineda-----------	B/D	None--------	---	---	0-1.0	Apparent	Jun-Nov	40-80	Hard	---	---	High-----	Low.
52*--------------- Anclote	D	None--------	---	---	+2-0	Apparent	Jun-Mar	>60	---	---	---	High-----	Moderate.
53---------------- Boca	B/D	None--------	---	---	0-1.0	Apparent	Jun-Feb	24-40	Hard	---	---	High-----	Moderate.
54---------------- Apopka	A	None--------	---	---	>6.0	---	---	>60	---	---	---	Moderate	High.
55. Udorthents													
56---------------- Lake	C	None--------	---	---	>6.0	---	---	>60	---	---	---	High-----	Moderate.
57---------------- Ona	B/D	None--------	---	---	0-1.0	Apparent	Jun-Nov	>60	---	---	---	High-----	High.
58:													
Myakka-----------	B/D	None--------	---	---	0-1.0	Apparent	Jun-Oct	40-80	Hard	---	---	High-----	High.
EauGallie--------	B/D	None--------	---	---	0-1.0	Apparent	Jun-Oct	50-80	Hard	---	---	High-----	Moderate.
59*--------------- Boca	D	None--------	---	---	+2-1.0	Apparent	Jun-Feb	24-40	Hard	---	---	High-----	Moderate.
60---------------- Broward	C	None--------	---	---	1.5-2.5	Apparent	Jun-Nov	20-40	Hard	---	---	Low------	Low.
61---------------- Orsino	A	None--------	---	---	3.5-5.0	Apparent	Jun-Dec	>60	---	---	---	Low------	Moderate.

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES--Continued

Map symbol and soil name	Hydro-logic group	Flooding			High water table			Bedrock		Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hard-ness	Ini-tial	Total	Uncoated steel	Concrete
					Ft			In		In	In		
62----------------- Malabar	B/D	None---------	---	---	0-1.0	Apparent	Jun-Nov	>60	---	---	---	High------	Low.
63----------------- Paisley	D	Rare---------	---	---	0-1.0	Apparent	Jun-Nov	>60	---	---	---	High------	Moderate.
64----------------- Citronelle	D	None---------	---	---	2.0-3.0	Apparent	Jun-Sep	5-20	Hard	---	---	High------	High.

* In the "High water table--Depth" column, a plus sign preceding the range in depth indicates that the high water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

TABLE 16.--PHYSICAL ANALYSES OF SELECTED SOILS

Soil name and sample number	Depth	Horizon	Particle-size distribution								Hydraulic conduc- tivity (saturated) 1/	Bulk density (field moisture) 1/	Water content 1/		
			Sand						Silt (0.05-0.002 mm)	Clay (<0.002 mm)			1/10 bar	1/3 bar	15 bar
			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)							
	Cm		Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Cm/hr	G/cc	----Pct(wt)----		
Adamsville fine sand: 3/															
S9-11-1 - - - - - - -	0-18	Ap	0.0	0.8	13.5	74.8	8.7	97.8	1.1	1.1	21.7	1.50	7.4	4.6	1.0
-2 - - - - - - -	18-51	C2	0.0	0.7	12.5	75.8	8.6	97.6	1.8	0.6	19.4	1.57	5.9	3.0	0.5
-3 - - - - - - -	51-99	C2	0.0	0.8	12.2	75.7	9.2	97.9	1.4	0.7	17.7	1.66	4.6	2.4	0.4
-4 - - - - - - -	99-152	C3	0.0	0.9	12.6	75.7	9.7	98.9	0.9	0.2	20.3	1.59	3.9	2.1	0.2
-5 - - - - - - -	152-203	C3	0.0	1.0	13.4	76.9	7.9	99.2	0.7	0.1	17.7	1.70	5.1	2.5	0.2
Arredondo fine sand: 3/															
S9--4-1 - - - - - - -	0-23	Ap	0.0	0.8	15.4	66.8	8.9	91.9	3.3	4.8	6.2	1.52	10.3	6.7	3.2
-2 - - - - - - -	23-66	E1	0.0	0.5	13.8	69.7	8.0	92.0	3.3	4.7	16.7	1.54	8.0	5.0	2.5
-3 - - - - - - -	66-104	E2	0.0	0.6	14.0	68.0	8.8	91.4	3.0	5.6	15.1	1.52	7.5	4.6	2.5
-4 - - - - - - -	104-165	Bt1	0.0	0.6	13.0	64.2	8.2	86.0	3.7	10.3	6.4	1.56	11.8	7.1	3.8
-5 - - - - - - -	165-203	Bt2	0.0	0.6	11.2	56.8	6.6	75.2	3.0	21.8	2.4	1.57	16.7	13.4	8.1
Astatula fine sand: 3/															
S9-13-1 - - - - - - -	0-13	A	0.0	0.2	19.7	70.0	8.4	98.3	0.7	1.0	27.6	1.40	7.5	5.0	1.8
-2 - - - - - - -	13-46	C1	0.0	0.2	17.2	70.8	9.3	97.5	1.6	0.9	28.9	1.48	6.2	3.4	0.8
-3 - - - - - - -	46-119	C2	0.0	0.2	16.7	71.7	8.9	97.5	1.1	1.4	27.3	1.53	4.8	2.8	0.8
-4 - - - - - - -	119-203	C3	0.0	0.3	16.5	71.9	9.0	97.7	0.0	2.3	22.3	1.62	4.1	2.1	0.6
Astatula fine sand: 4/															
S9-14-1 - - - - - - -	0-10	A	0.0	0.2	4.3	82.6	10.9	98.0	0.9	1.1	23.6	1.35	7.4	4.3	1.1
-2 - - - - - - -	10-36	C1	0.1	0.2	4.2	83.0	10.5	98.0	0.0	2.0	23.6	1.50	6.7	2.9	0.6
-3 - - - - - - -	36-98	C2	0.0	0.1	4.1	83.9	10.3	98.4	0.0	1.6	27.3	1.48	4.7	2.3	0.5
-4 - - - - - - -	98-203	C3	0.0	0.1	3.7	85.8	8.9	98.5	0.0	1.5	23.7	1.56	4.4	1.8	0.5
Candler fine sand: 3/															
S9-16-1 - - - - - - -	0-10	A	0.0	0.8	17.3	73.3	6.1	97.5	1.4	1.1	18.7	1.61	5.5	2.8	0.9
2 - - - - - - -	10-36	E1	0.0	0.8	17.5	72.6	6.3	97.2	0.0	2.8	14.8	1.65	5.2	2.7	0.7
3 - - - - - - -	36-89	E2	0.0	0.8	18.3	72.7	5.9	97.7	1.5	0.8	21.3	1.57	4.5	2.0	0.6
4 - - - - - - -	89-132	E3	0.0	0.7	15.3	75.4	6.8	98.2	1.2	0.6	23.3	1.57	3.7	1.7	0.5
5 - - - - - - -	132-183	E4	0.0	0.7	15.9	75.5	6.4	98.5	1.0	0.5	25.9	1.54	3.6	1.7	0.4
6 - - - - - - -	183-203	E/Bt	0.0	0.6	16.2	75.3	6.3	98.4	0.9	0.7	29.9	1.58	3.4	1.6	0.3
Citronelle fine sand: 5/															
S9-18-1 - - - - - - -	0-5	A	0.0	0.5	11.0	66.4	11.0	88.9	6.0	5.1	19.8	1.10	21.6	16.9	3.0
-2 - - - - - - -	5-13	Bw1	0.1	0.7	11.8	67.4	10.7	90.7	6.6	2.7	3.9	1.36	15.9	11.2	1.7
-3 - - - - - - -	13-20	Bw2	0.1	0.7	11.6	63.3	10.3	86.0	8.2	5.8	2.1	1.33	23.7	19.5	4.0

See footnotes at end of table.

TABLE 16.--PHYSICAL ANALYSES OF SELECTED SOILS

Soil name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very coarse (2-1 mm)	Coarse (1-0.5 mm)	Medium (0.5-0.25 mm)	Fine (0.25-0.1 mm)	Very fine (0.1-0.05 mm)	Total (2-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)	Hydraulic conductivity (saturated) 1/	Bulk density (field moisture) 1/	Water content 1/: 1/10 bar	1/3 bar	15 bar
	Cm		Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Cm/hr	G/cc	----Pct (wt)----		
EauGallie fine sand: 2/ 3/															
S9--9-1 -------	0-8	A1	0.0	1.0	18.6	64.0	12.3	95.9	3.3	0.8	78.9	0.47	89.7	69.5	39.2
-2 -------	8-25	A2	0.0	1.1	32.3	58.2	5.3	96.9	2.4	0.7	18.0	1.40	9.9	6.2	1.8
-3 -------	25-56	E	0.0	1.1	18.1	68.5	11.0	98.7	0.9	0.4	13.3	1.56	4.7	3.2	0.8
-4 -------	56-114	Bh1	0.0	1.2	16.5	68.4	9.6	95.7	4.1	0.2	3.0	1.37	30.3	25.2	2.3
-5 -------	114-135	Bh2	0.0	1.5	17.2	68.2	9.6	96.5	1.1	2.4	3.3	1.65	12.5	8.4	1.3
-6 -------	135-173	Btg1	0.0	0.5	9.9	52.7	14.4	77.5	2.6	19.9	6.8	1.55	23.9	21.9	6.9
-7 -------	173-203	Btg2	0.0	0.4	8.2	57.2	14.8	80.6	2.4	17.0	20.5	1.59	23.0	20.8	8.2
Fort Meade loamy fine sand: 3/															
S9-15-1 -------	0-33	A1	0.0	1.5	19.2	55.1	4.4	80.2	12.7	7.1	---	1.25	20.7	15.4	5.1
-2 -------	33-86	C1	0.1	1.7	22.7	57.7	4.8	87.0	5.6	7.4	21.0	1.26	17.1	12.1	4.6
-3 -------	86-142	C2	0.1	1.9	23.7	58.5	4.4	88.6	3.7	7.7	24.3	1.39	11.2	8.2	4.2
-4 -------	142-203	C3	0.1	1.4	20.9	60.8	4.9	88.1	3.4	8.5	20.0	1.45	9.0	6.6	4.1
Kendrick fine sand: 6/															
S9-23-1 -------	0-18	Ap	0.0	0.8	11.9	68.7	7.8	89.2	3.1	7.7	24.4	1.41	10.8	7.7	3.2
-2 -------	18-53	E	0.0	0.5	10.3	67.5	7.9	86.2	5.8	8.0	9.8	1.55	9.8	6.8	3.8
-3 -------	53-84	Bt1	0.0	0.6	8.6	51.6	6.4	67.2	7.2	25.6	0.7	1.56	18.7	16.4	10.3
-4 -------	84-114	Bt1	0.0	0.4	7.8	49.6	6.8	64.6	5.2	30.2	2.4	1.56	17.1	14.3	9.0
-5 -------	114-155	Bt2	0.0	0.4	8.4	45.8	5.4	60.0	4.6	35.4	0.4	1.60	19.5	17.3	11.6
-6 -------	155-203	C	0.0	0.4	8.8	47.4	4.0	60.6	4.1	35.3	1.1	1.57	21.4	17.2	11.4
Lochloosa fine sand: 2/ 3/															
S9--7-1 -------	0-20	Ap	0.0	1.1	16.6	64.1	9.6	91.4	3.7	4.9	6.7	1.53	11.2	6.6	2.9
-2 -------	20-43	E1	0.1	1.1	15.1	63.7	11.1	91.1	4.2	4.7	8.5	1.55	9.4	5.8	2.5
-3 -------	43-68	E2	0.0	1.0	15.0	63.0	11.2	90.2	6.9	2.9	14.4	1.54	8.9	5.7	2.7
-4 -------	68-94	Bt1	0.0	1.2	12.8	46.2	10.2	70.4	18.2	11.4	1.0	1.58	19.1	15.9	8.2
-5 -------	94-122	Bt2	0.0	0.8	12.0	42.0	7.8	62.6	5.6	31.8	2.2	1.42	26.0	24.1	15.6
-6 -------	122-160	BCg	0.6	1.8	8.2	23.8	6.8	41.2	11.8	47.0	0.8	1.62	20.4	18.2	11.2
-7 -------	160-203	Cg	0.4	1.0	11.2	41.8	8.8	63.2	6.5	30.3	0.0	1.47	28.8	27.2	21.3
Micanopy loamy fine sand: 7/															
S9-24-1 -------	0-18	Ap	0.1	1.0	11.6	56.6	17.7	87.0	4.0	9.0	1.4	1.48	17.0	13.2	4.2
-2 -------	18-38	Bt1	0.0	0.2	4.2	19.8	8.2	32.4	9.8	57.8	0.1	1.27	35.8	33.1	19.6
-3 -------	38-53	Bt2	0.0	0.2	2.0	11.0	8.0	21.2	10.6	68.2	0.4	0.99	57.2	52.7	31.2
-4 -------	53-107	Btg1	0.0	0.2	1.6	13.0	11.4	26.2	12.8	61.0	0.1	1.04	52.5	48.3	29.9
-5 -------	107-147	Btg2	0.0	0.2	1.6	11.8	10.8	24.4	12.4	63.2	0.3	1.13	45.3	42.1	27.5
-6 -------	147-183	Btg3	0.0	0.2	1.2	11.2	10.6	23.2	13.2	63.6	0.0	1.15	50.0	46.8	32.8
-7 -------	183-203	BCg	0.0	0.2	1.4	12.0	12.0	25.6	13.8	60.6	3.4	1.17	44.7	42.2	29.8

See footnotes at end of table.

TABLE 16.--PHYSICAL ANALYSES OF SELECTED SOILS

Soil name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very coarse (2-1 mm)	Coarse (1-0.5 mm)	Medium (0.5-0.25 mm)	Fine (0.25-0.1 mm)	Very fine (0.1-0.05 mm)	Total (2-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)	Hydraulic conductivity (saturated) 1/	Bulk density (field moisture) 1/	Water content 1/: 1/10 bar	1/3 bar	15 bar
	Cm		Pct	Pct	Pct	Pct	Pct	Pct	Pct	Pct	Cm/hr	G/cc	Pct (wt)	Pct (wt)	Pct (wt)
Myakka fine sand: 3/															
S9-10-1	0-10	A	0.0	1.5	21.5	63.4	8.8	95.2	4.4	0.4	14.1	1.28	21.7	15.0	4.2
-2	10-25	E1	0.0	1.4	22.8	63.6	6.9	94.7	4.3	1.0	34.5	1.31	13.8	9.9	1.9
-3	25-68	E2	0.0	1.4	19.9	66.5	11.1	98.9	0.6	0.5	12.0	1.49	7.6	5.0	1.1
-4	68-107	Bh1	0.0	1.2	16.8	71.6	10.0	99.6	0.1	0.3	0.5	1.56	22.2	16.5	2.9
-5	107-140	Bh2	0.0	1.2	16.8	68.4	10.0	96.4	1.1	2.5	4.5	1.61	12.3	7.5	1.2
-6	140-170	BC	0.0	1.3	18.2	68.9	8.8	97.2	2.8	1.0	1.9	1.61	13.3	7.6	1.0
-7	170-203	Bh'	0.0	1.2	17.3	68.1	9.6	96.2	2.4	1.4	1.4	1.64	14.9	8.1	1.1
Redlevel fine sand: 3/															
S9--1-1	0-8	A1	0.0	0.6	25.7	67.1	3.1	96.5	1.4	2.1	31.6	1.40	7.5	4.8	2.0
-2	8-18	A2	0.0	0.5	25.3	65.6	3.5	94.9	3.8	1.3	25.0	1.46	7.3	4.7	1.5
-3	18-38	Bw1	0.2	0.8	25.2	63.4	3.2	92.8	5.2	2.0	15.1	1.61	5.4	3.4	1.1
-4	38-66	Bw2	0.0	0.8	24.2	68.0	3.4	96.4	0.6	3.0	11.1	1.58	6.2	4.2	1.6
-5	66-107	Bw3	0.0	0.4	22.2	63.2	3.8	89.6	1.9	8.5	16.7	1.55	8.1	5.7	2.5
-6	107-140	Bw4	0.0	0.6	22.2	65.2	3.0	91.0	2.1	6.9	9.9	1.58	9.0	6.2	2.5
Sparr fine sand: 8/															
S9-26-1	0-20	Ap	0.0	0.5	12.4	63.9	17.7	94.5	3.1	2.4	13.1	1.54	8.9	4.9	1.4
-2	20-68	E1	0.0	0.4	12.1	63.9	17.1	93.5	4.8	1.7	18.1	1.55	7.8	4.1	0.8
-3	68-91	E2	0.0	0.4	11.3	64.7	17.9	94.3	4.2	1.5	21.3	1.58	5.8	2.8	0.7
-4	91-132	E3	0.0	0.4	11.0	65.4	18.4	95.2	4.4	0.4	15.8	1.58	5.1	2.1	0.4
-5	132-155	EB	0.1	0.6	10.8	61.0	16.7	89.2	5.6	5.2	4.6	1.65	8.7	4.7	1.2
-6	155-180	Btg1	0.0	0.4	9.8	54.0	16.6	80.8	5.9	13.3	0.3	1.69	12.8	10.0	4.9
-7	180-203	Btg2	0.0	0.4	9.0	49.0	14.6	73.0	4.4	22.6	0.4	1.63	17.1	13.8	6.8
Tavares fine sand: 3/															
S9-12-1	0-8	A	0.0	0.4	15.1	73.1	9.3	97.9	0.9	1.2	20.2	1.52	7.5	4.5	1.0
-2	8-56	C1	0.0	0.6	16.0	71.7	9.2	97.5	1.5	1.0	23.0	1.56	5.9	3.4	0.6
-3	56-104	C1	0.0	0.8	16.2	71.9	8.9	97.8	1.2	1.0	24.3	1.61	4.8	2.3	0.6
-4	104-160	C2	0.0	0.4	13.2	75.3	9.7	98.6	0.8	0.6	18.2	1.61	4.0	1.9	0.4
-5	160-203	C3	0.0	1.3	21.6	63.6	9.0	95.5	4.3	0.2	21.5	1.61	3.4	1.9	0.1

1/ Hydraulic conductivity, bulk density, and water content data were determined from a disturbed core. These values may or may not agree with the values on Table 14--Physical and Chemical Properties of the Soils.

2/ This soil is a taxadjunct to the series. See the series description in the section "Soil Series and Their Morphology" for an explanation of those characteristics of the soil that are outside the range of the series.

3/ Typical pedon for the series. Refer to "Soil Series and Their Morphology" for location of pedon.

4/ Astatula fine sand: Pedon is about 3.5 miles west of Florida State Road 496 and 3 miles north of State Road 44; SW1/4NE1/4 sec. 12, T. 18 S., R. 17 E.

5/ Citronelle fine sand: Pedon is about 2 miles west of U.S. Highway 19 and 30 feet east of trails; NW1/4NE1/4 sec. 13, T. 18 S., R. 16 E.

6/ Kendrick loamy fine sand: Pedon is about 2,500 feet west of Florida State Road 581 and 2.7 miles north of County Road 480; SE1/4SW1/4 sec. 13, T. 20 S., R. 19 E.

7/ Micanopy loamy fine sand: Pedon is about 1.8 miles west of Florida State Road 581 and 1,500 feet south of County Road 480; SW1/4SE1/4 sec. 34, T. 20 S., R. 17 E.

8/ Sparr fine sand: Pedon is about 500 feet east of Florida State Road 491 near its junction with Grover Cleveland Boulevard; NE1/4NE1/4 sec. 28, T. 19 S., R. 18 E.

TABLE 17.--CHEMICAL ANAYLSES OF SELECTED SOILS

Soil name and sample number	Depth	Horizon	Extractable bases: Ca	Mg	Na	K	Sum	Extractable acidity	Sum of cations	Base saturation	Organic carbon	Electrical conductivity	pH: H_2O (1:1)	$CaCl_2$ 0.1m (1:2)	KCl in (1:1)	Pyrophosphate extractable: C	Fe	Al	Citrate dithionite extractable: Fe	Al
	Cm		-----Milliequivalents/100 grams of soil-----							Pct	Pct	Mmho/cm				Pct	Pct	Pct	Pct	Pct
Adamsville fine sand: 3/																				
S9-11-1 - -	0-18	Ap	1.19	0.27	0.02	0.13	1.61	3.43	5.04	32	0.81	0.05	5.7	4.7	4.6	---	---	---	---	---
-2 - -	18-51	C1	0.20	0.07	0.01	0.03	0.31	1.05	1.36	23	0.16	0.03	5.6	5.0	4.8	---	---	---	---	---
-3 - -	51-99	C2	0.12	0.05	0.01	0.01	0.19	0.53	0.72	26	0.08	0.03	5.6	5.0	4.8	---	---	---	---	---
-4 - -	99-152	C3	0.04	0.04	0.02	0.00	0.10	0.30	0.40	25	0.01	0.02	5.7	4.9	4.7	---	---	---	---	---
-5 - -	152-203	C3	0.06	0.02	0.01	0.00	0.09	0.15	0.24	38	0.02	0.01	5.8	5.3	4.9	---	---	---	---	---
Arrendondo fine sand: 3/																				
S9--4-1 - -	0-23	Ap	1.05	0.27	0.03	0.04	1.39	7.13	8.52	16	0.83	0.02	5.0	4.9	4.7	---	---	---	---	---
-2 - -	23-66	E1	0.16	0.11	0.02	0.01	0.30	5.04	5.34	6	0.28	0.01	5.1	4.8	4.6	---	---	---	---	---
-3 - -	66-104	E2	0.26	0.17	0.03	0.01	0.47	4.02	4.49	10	0.14	0.01	5.1	4.8	4.6	---	---	---	---	---
-4 - -	104-165	Bt1	0.04	0.66	0.03	0.01	0.74	4.67	5.41	14	0.11	0.01	5.2	5.0	4.7	---	---	---	---	---
-5 - -	165-203	Bt2	0.19	0.74	0.06	0.00	0.99	7.02	8.01	12	0.20	0.01	4.8	4.6	4.4	---	---	---	1.33	0.27
Astatula fine sand: 3/																				
S9-13-1 - -	0-13	A	0.11	0.04	0.02	0.02	0.19	2.21	2.40	8	0.71	0.03	4.9	4.1	3.9	---	---	---	---	---
-2 - -	13-46	C1	0.03	0.01	0.02	0.01	0.07	1.67	1.74	4	0.47	0.03	4.9	4.6	4.4	---	---	---	---	---
-3 - -	46-119	C2	0.02	0.01	0.01	0.00	0.04	0.74	0.78	5	0.08	0.02	4.6	4.5	4.5	---	---	---	---	---
-4 - -	119-203	C3	0.02	0.01	0.01	0.00	0.04	0.64	0.68	6	0.09	0.02	4.7	4.5	4.5	---	---	---	---	---
Astatula fine sand: 4/																				
S9-14-1 - -	0-10	A	0.43	0.07	0.02	0.02	0.54	3.77	4.31	13	1.04	0.04	4.8	4.0	3.7	---	---	---	---	---
-2 - -	10-36	C1	0.06	0.02	0.02	0.01	0.11	1.73	1.84	6	0.32	0.03	5.3	4.6	4.5	---	---	---	---	---
-3 - -	36-98	C2	0.05	0.02	0.01	0.00	0.08	0.61	0.69	12	0.10	0.01	5.0	4.6	4.6	---	---	---	---	---
-4 - -	98-203	C3	0.03	0.02	0.01	0.00	0.06	0.59	0.65	9	0.09	0.01	4.8	4.6	4.6	---	---	---	---	---
Candler fine sand: 3/																				
S9-16-1 - -	0-10	A	0.18	0.05	0.01	0.01	0.25	2.77	3.02	8	0.51	0.02	5.1	4.4	4.1	---	---	---	---	---
-2 - -	10-36	E1	0.03	0.02	0.01	0.01	0.07	1.43	1.50	5	0.19	0.02	5.0	4.6	4.5	---	---	---	---	---
-3 - -	36-89	E2	0.03	0.02	0.01	0.00	0.06	0.55	0.61	10	0.06	0.02	5.1	4.7	4.6	---	---	---	---	---
-4 - -	89-132	E3	0.01	0.02	0.01	0.00	0.04	0.41	0.45	9	0.03	0.01	5.1	4.8	4.7	---	---	---	---	---
-5 - -	132-183	E4	0.02	0.02	0.01	0.00	0.05	0.19	0.24	21	0.05	0.01	5.5	4.9	4.7	---	---	---	---	---
-6 - -	183-203	E/Bt	0.02	0.03	0.01	0.00	0.06	0.34	0.40	15	0.04	0.01	5.4	4.8	4.7	---	---	---	---	---
Citronelle fine sand: 5/																				
S9-18-1 - -	0-5	A	3.50	2.88	1.98	0.24	8.60	9.04	17.64	49	3.06	2.25	4.7	4.6	4.3	---	---	---	---	---
-2 - -	5-13	Bw1	3.25	1.81	1.40	0.09	6.55	0.95	7.50	87	0.69	1.08	6.6	6.5	6.4	---	---	---	---	---
-3 - -	13-20	Bw2	19.00	3.79	4.41	0.19	27.39	0.58	27.97	98	1.17	2.28	8.2	7.7	7.6	---	---	---	0.56	0.07

See footnotes at end of table.

TABLE 17.--CHEMICAL ANAYLSES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Extractable bases: Ca	Extractable bases: Mg	Extractable bases: Na	Extractable bases: K	Extractable bases: Sum	Extractable acidity	Sum of cations	Base saturation	Organic carbon	Electrical conductivity	pH H_2O (1:1)	pH $CaCl_2$ 0.1m (1:2)	pH KCl in (1:1)	Pyrophosphate extractable: C	Pyrophosphate extractable: Fe	Pyrophosphate extractable: Al	Citrate dithionite extractable: Fe	Citrate dithionite extractable: Al
	Cm		-----Milliequivalents/100 grams of soil-----							Pct	Pct	Mmho/cm				Pct	Pct	Pct	Pct	Pct
Durbin muck: 6/																				
S9-20-1 - -	0-8	Oa1	17.75	23.87	56.55	5.66	103.83	34.64	138.47	75	21.50	108.75	4.7	4.8	4.8	---	---	---	---	---
-2 - -	8-33	Oa2	21.00	24.28	53.07	3.45	101.80	61.52	163.32	62	25.95	122.50	3.6	3.7	3.6	---	---	---	---	---
-3 - -	33-74	Oa3	32.50	37.04	83.30	3.94	156.78	69.12	225.90	69	23.45	120.00	3.5	3.6	3.4	---	---	---	---	---
-4 - -	74-132	Oa3	30.00	31.69	64.82	2.79	129.30	50.02	179.32	72	14.22	81.25	3.4	3.6	3.3	---	---	---	---	---
EauGallie fine sand: 1/ 3/																				
S9--9-1 - -	0-8	A1	4.80	3.36	0.12	0.13	8.41	11.50	19.91	42	4.64	0.09	4.9	4.3	4.3	---	---	---	---	---
-2 - -	8-25	A2	0.51	0.56	0.04	0.03	1.14	3.05	4.19	27	0.72	0.03	4.8	3.6	3.6	---	---	---	---	---
-3 - -	25-56	E	0.05	0.03	0.02	0.00	0.10	0.45	0.55	18	0.05	0.02	4.9	4.0	3.9	---	---	---	---	---
-4 - -	56-114	Bh1	0.15	0.18	0.07	0.00	0.40	18.90	19.30	2	1.91	0.06	4.0	3.2	3.1	1.71	0.02	0.08	0.02	0.07
-5 - -	114-135	Bh2	0.24	0.05	0.05	0.00	0.34	9.23	9.57	4	0.75	0.03	4.5	3.7	3.6	0.67	0.02	0.07	0.03	0.04
-6 - -	135-173	Btg1	2.53	0.48	0.11	0.14	3.26	9.40	12.66	26	0.33	0.05	4.8	4.1	4.0	---	---	---	0.07	0.05
-7 - -	173-203	Btg2	3.80	0.48	0.09	0.14	4.51	7.36	11.87	38	0.10	0.04	5.0	4.1	3.9	---	---	---	0.07	0.03
Fort Meade loamy fine sand: 3/																				
S9-15-1 - -	0-33	A1	1.65	0.24	0.05	0.03	1.97	23.93	25.90	8	3.07	0.03	5.2	4.4	4.1	---	---	---	---	---
-2 - -	33-86	C1	0.26	0.06	0.02	0.01	0.35	11.63	11.98	3	1.06	0.02	5.6	4.9	4.6	---	---	---	---	---
-3 - -	86-142	C2	0.17	0.09	0.02	0.01	0.29	7.55	7.84	4	0.64	0.01	5.6	5.1	4.8	---	---	---	---	---
-4 - -	142-203	C3	0.15	0.10	0.01	0.01	0.27	5.76	6.03	4	0.18	0.02	5.6	5.1	4.9	---	---	---	---	---
Kendrick fine sand: 7/																				
S9-23-1 - -	0-18	Ap	0.65	0.28	0.02	0.07	1.02	7.61	8.63	12	1.00	0.03	4.9	4.4	4.0	---	---	---	---	---
-2 - -	18-53	E	1.07	0.49	0.03	0.02	1.61	4.54	6.15	26	0.40	0.02	5.2	4.7	4.6	---	---	---	---	---
-3 - -	53-84	Bt1	1.39	1.60	0.04	0.02	1.61	7.13	8.74	18	0.20	0.03	5.1	4.7	4.5	---	---	---	0.74	0.20
-4 - -	84-114	Bt1	1.15	1.60	0.03	0.01	2.79	6.76	9.55	29	0.13	0.03	5.1	4.6	4.5	---	---	---	0.86	0.20
-5 - -	114-155	Bt2	0.83	1.40	0.03	0.01	2.27	7.89	10.16	22	0.13	0.02	5.1	4.4	4.2	---	---	---	0.91	0.22
-6 - -	155-203	C	0.49	0.99	0.03	0.01	1.52	7.26	8.78	17	0.13	0.01	5.2	4.2	4.1	---	---	---	---	---
Lake fine sand: 3/																				
S9--5-1 - -	0-18	Ap	0.13	0.02	0.02	0.05	0.22	7.74	7.96	3	0.84	0.03	4.6	4.4	4.1	---	---	---	---	---
-2 - -	18-68	C1	0.04	0.01	0.02	0.01	0.08	3.83	3.91	2	0.25	0.02	5.3	4.7	4.5	---	---	---	---	---
-3 - -	68-102	C2	0.04	0.01	0.03	0.01	0.09	3.43	3.52	3	0.14	0.02	5.3	4.6	4.6	---	---	---	---	---
-4 - -	102-142	C3	0.09	0.02	0.02	0.01	0.14	2.77	2.91	5	0.06	0.01	4.7	4.8	4.8	---	---	---	---	---
-5 - -	142-203	C3	0.09	0.02	0.01	0.00	0.12	2.67	2.79	4	0.05	0.01	4.7	4.8	4.7	---	---	---	---	---

See footnotes at end of table.

TABLE 17.--CHEMICAL ANAYLSES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Extractable bases: Ca	Extractable bases: Mg	Extractable bases: Na	Extractable bases: K	Extractable bases: Sum	Extractable acidity	Sum of cations	Base saturation	Organic carbon	Electrical conductivity	pH H_2O (1:1)	pH $CaCl_2$ 0.1m (1:2)	pH KCl in (1:1)	Pyrophosphate extractable: C	Pyrophosphate extractable: Fe	Pyrophosphate extractable: Al	Citrate dithionite extractable: Fe	Citrate dithionite extractable: Al
	Cm		Milliequivalents/100 grams of soil							Pct	Pct	Mmho/cm				Pct	Pct	Pct	Pct	Pct
Lochloosa fine sand: 1/ 3/																				
S9--7-1 - -	0-20	Ap	1.67	0.66	0.03	0.02	2.38	12.40	14.78	19	1.20	0.02	4.8	4.8	4.6	---	---	---	---	---
-2 - -	20-43	E1	0.62	0.28	0.03	0.01	0.94	12.70	13.64	7	0.51	0.00	5.3	5.0	4.4	---	---	---	---	---
-3 - -	43-68	E2	0.55	0.29	0.03	0.01	0.88	10.92	11.80	7	0.26	0.00	4.8	4.7	4.4	---	---	---	---	---
-4 - -	68-94	Bt1	2.12	1.56	0.07	0.03	3.78	17.27	21.05	18	0.23	0.01	4.6	4.5	4.1	---	---	---	0.71	0.18
-5 - -	94-122	Bt2	1.92	1.73	0.09	0.04	3.78	12.31	16.09	23	0.17	0.02	4.5	4.3	4.1	---	---	---	0.87	0.21
-6 - -	122-160	BCg	2.05	2.06	0.11	0.17	4.39	17.08	21.47	20	0.13	0.01	4.4	4.1	3.8	---	---	---	---	---
-7 - -	160-203	Cg	1.05	1.28	0.07	0.04	2.44	13.05	15.49	16	0.12	0.01	4.5	4.2	4.0	---	---	---	---	---
Micanopy loamy fine sand: 2/ 8/																				
S9-24-1 - -	0-18	Ap	2.97	1.48	0.07	0.25	4.77	12.91	17.68	27	2.18	0.07	4.9	4.3	4.1	---	---	---	---	---
-2 - -	18-38	Bt1	5.92	5.76	0.23	0.55	12.46	31.20	43.66	29	1.06	0.05	4.9	4.0	3.7	---	---	---	1.08	0.49
-3 - -	38-53	Bt2	4.65	5.35	0.33	0.63	10.96	35.78	46.74	23	0.44	0.03	4.9	3.8	3.5	---	---	---	1.41	0.31
-4 - -	53-107	Btg1	6.15	4.94	0.44	0.86	12.39	40.54	52.93	23	0.15	0.02	4.5	3.5	3.3	---	---	---	1.06	0.38
-5 - -	107-147	Btg2	4.65	4.53	0.42	0.77	10.37	40.56	50.93	20	0.28	0.02	4.4	3.7	3.1	---	---	---	1.24	0.30
-6 - -	147-183	Btg3	9.75	6.58	0.57	1.00	17.90	42.85	60.75	29	0.20	0.03	4.3	3.6	3.3	---	---	---	0.92	0.14
-7 - -	183-203	BCg	10.92	6.17	0.60	0.92	18.61	41.79	60.40	31	0.11	0.02	4.3	3.6	3.3	---	---	---	---	---
Myakka fine sand: 3/																				
S9-10-1 - -	0-10	A	2.46	2.33	0.11	0.05	4.95	9.69	14.64	34	3.01	0.07	4.9	4.1	4.1	---	---	---	---	---
-2 - -	10-25	E1	1.13	0.89	0.08	0.02	2.12	4.63	6.75	31	1.25	0.05	4.9	3.8	3.9	---	---	---	---	---
-3 - -	25-68	E2	0.05	0.03	0.02	0.00	0.10	0.08	0.18	56	0.09	0.02	5.0	4.1	3.9	---	---	---	---	---
-4 - -	68-107	Bh1	0.12	0.04	0.05	0.00	0.21	14.25	14.46	1	2.55	0.05	4.2	3.3	3.3	1.25	0.01	0.07	0.02	0.04
-5 - -	107-140	Bh2	0.24	0.04	0.05	0.00	0.33	10.66	10.99	3	1.43	0.03	4.5	3.5	3.5	0.94	0.01	0.05	0.01	0.03
-6 - -	140-170	BC	0.49	0.05	0.03	0.00	0.57	5.37	5.94	10	0.83	0.03	5.1	4.3	4.2	---	---	---	---	---
-7 - -	170-203	Bh'	4.35	0.08	0.08	0.01	4.52	4.71	9.23	49	0.74	0.05	6.3	5.4	5.4	0.40	0.00	0.23	0.03	0.09
Redlevel fine sand: 3/																				
S9--1-1 - -	0-8	A1	1.87	0.49	0.05	0.01	2.42	4.35	6.77	36	1.10	0.03	5.0	5.0	4.7	---	---	---	---	---
-2 - -	8-18	A2	0.97	0.21	0.03	0.01	1.22	3.29	4.51	27	0.73	0.01	4.9	4.8	4.4	---	---	---	---	---
-3 - -	18-38	Bw1	0.60	0.13	0.04	0.01	0.78	1.24	2.02	39	0.17	0.02	5.4	5.4	5.1	---	---	---	---	---
-4 - -	38-66	Bw2	0.75	0.17	0.03	0.01	0.96	2.16	3.12	31	0.12	0.02	5.4	5.2	4.8	---	---	---	---	---
-5 - -	66-107	Bw3	0.40	0.21	0.03	0.01	0.65	2.50	3.15	21	0.10	0.02	4.5	4.5	4.4	---	---	---	---	---
-6 - -	107-140	Bw4	1.25	0.21	0.03	0.01	1.50	2.13	3.63	41	0.07	0.02	4.7	4.8	4.6	---	---	---	---	---

See footnotes at end of table.

TABLE 17.--CHEMICAL ANAYLSES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Extractable bases: Ca	Mg	Na	K	Sum	Extractable acidity	Sum of cations	Base saturation	Organic carbon	Electrical conductivity	pH H_2O (1:1)	pH $CaCl_2$ 0.1m (1:2)	pH KCl in (1:1)	Pyrophosphate extractable: C	Fe	Al	Citrate dithionite extractable: Fe	Al
	Cm		-----Milliequivalents/100 grams of soil-----							Pct	Pct	Mmho/cm				Pct	Pct	Pct	Pct	Pct
Sparr fine sand: 9/																				
S9-26-1 - -	0-20	Ap	1.10	0.27	0.02	0.08	1.47	5.19	6.66	22	1.40	0.02	4.9	4.5	4.3	---	---	---	---	---
-2 - -	20-68	E1	0.12	0.03	0.03	0.02	0.20	2.42	2.62	8	0.34	0.01	5.1	4.6	4.3	---	---	---	---	---
-3 - -	68-91	E2	0.07	0.03	0.02	0.02	0.14	1.13	1.27	11	0.15	0.01	5.2	4.6	4.4	---	---	---	---	---
-4 - -	91-132	E3	0.07	0.03	0.02	0.01	0.13	0.39	0.52	25	0.09	0.01	5.3	4.8	4.6	---	---	---	---	---
-5 - -	132-155	EB	0.32	0.17	0.02	0.05	0.56	2.25	2.81	20	0.10	0.01	5.0	4.5	4.3	---	0.06	0.06	0.46	0.08
-6 - -	155-180	Btg1	0.38	0.31	0.06	0.04	0.79	5.43	6.22	13	0.10	0.01	4.8	4.0	3.9	---	0.05	0.08	0.54	0.12
-7 - -	180-203	Btg2	0.24	0.41	0.06	0.06	0.77	7.82	8.59	9	0.14	0.02	4.6	3.9	3.8	---	0.04	0.09	0.64	0.15
Tavares fine sand: 3/																				
S9-12-1 - -	0-8	A	0.64	0.16	0.01	0.03	0.84	2.32	3.16	27	0.83	0.03	5.2	4.2	4.0	---	---	---	---	---
-2 - -	8-56	C1	0.04	0.02	0.01	0.01	0.08	1.27	1.35	6	0.12	0.02	4.8	4.6	4.6	---	---	---	---	---
-3 - -	56-104	C1	0.02	0.01	0.00	0.00	0.03	0.93	0.96	3	0.08	0.02	4.7	4.5	4.6	---	---	---	---	---
-4 - -	104-160	C2	0.03	0.02	0.02	0.00	0.07	0.30	0.37	19	0.03	0.02	5.2	4.7	4.6	---	---	---	---	---
-5 - -	160-203	C3	0.02	0.01	0.01	0.00	0.04	0.10	0.14	29	0.03	0.02	5.5	4.9	4.8	---	---	---	---	---

1/ This soil is a taxadjunct to the series. See the series description in the section "Soil Series and Their Morphology" for an explanation of those characteristics of the soil that are outside the range of the series.

2/ The base saturation of this pedon is 6 percent to low for an Alfisol. This difference is considered to be within the range of allowable error.

3/ Typical pedon for the series. Refer to "Soil Series and Their Morphology" for location of pedon.

4/ Astatula fine sand: Pedon is about 3.5 miles west of Florida State Road 495 and 3 miles north of State Road 44; SW1/4NE1/4 sec. 12, T. 18 S., R. 17 E.

5/ Citronelle fine sand: Pedon is about 2 miles west of U.S. Highway 19 and 30 feet east of trails; NW1/4NE1/4 sec. 13, T. 18 S., R. 16 E.

6/ Durbin muck: Pedon is near west terminus of Florida State Road 44 and 15 feet east of boat ramp; SW1/4NW1/4 sec. 16, T. 18 S., R. 16 E.

7/ Kendrick loamy fine sand: Pedon is about 2,500 feet west of Florida State Road 581 and 2.7 miles north of County Road 480; SE1/4SW1/4 sec. 13, T. 20 S., R. 19 E.

8/ Micanopy loamy fine sand: Pedon is about 1.8 miles west of Florida State Road 581 and 1,500 feet south of County Road 480; SW1/4SE1/4 sec. 34, T. 20 S., R. 17 E.

9/ Sparr fine sand: Pedon is about 500 feet east of Florida State Road 491 near its junction with Grover Cleveland Boulevard; NE1/4NE1/4 sec. 28, T. 19 S., R. 18 E.

TABLE 18.--CLAY MINERALOGY OF SELECTED SOILS

Soil name and sample number	Depth	Horizon	Clay minerals					
			Montmorillonite	14-Angstrom intergrade	Kaolinite	Gibbsite	Quartz	Calcite
	Cm		Pct	Pct	Pct	Pct	Pct	Pct
Adamsville fine sand: 2/								
S9-11-1	0-18	Ap	0	53	18	0	29	0
-3	51-99	C2	0	64	21	0	15	0
-5	152-203	C3	0	65	15	0	20	0
Arredondo fine sand: 2/								
S9--4-1	0-23	Ap	0	41	48	0	11	0
-3	66-104	E2	0	37	54	0	9	0
-5	165-203	Bt2	0	30	66	0	4	0
Astatula fine sand: 2/								
S9-13-1	0-13	A	0	62	18	0	0	0
-3	46-119	C2	0	52	17	25	6	0
-4	119-203	C3	16	46	15	19	4	0
Astatula fine sand: 3/								
S9-14-1	0-10	A	0	51	26	0	23	0
-3	36-98	C2	12	49	31	0	8	0
-4	98-203	C3	15	49	28	0	8	0
Candler fine sand: 2/								
S9-16-1	0-10	A	0	53	21	16	10	0
-3	36-89	E2	6	50	20	14	10	0
-6	183-203	E/Bt	7	48	22	15	8	0
Citronelle fine sand: 2/								
S9-18-1	0-5	A	41	34	13	0	12	0
-3	13-20	Bw2	57	27	9	0	7	0
EauGallie fine sand: 1/ 2/								
S9--9-1	0-8	A1	0	0	8	0	88	4
-4	56-114	Bh1	28	0	18	0	52	2
-6	135-173	Btg1	0	15	42	0	24	0
Fort Meade loamy fine sand: 2/								
S9-15-1	0-33	A1	0	34	52	0	14	0
-3	86-142	C1	0	27	54	0	19	0
-4	142-203	C2	0	29	50	0	21	0
Kendrick fine sand: 5/								
S9-23-1	0-18	Ap	10	28	51	0	9	2
-3	53-84	Bt1	8	26	61	0	4	1
-6	155-203	C	6	18	72	0	4	0
Lake fine sand: 2/								
S9--5-1	0-18	Ap	0	61	24	0	15	0
-3	68-102	C2	0	58	29	0	13	0
-5	142-203	C3	0	59	29	0	12	0
Lochloosa fine sand: 1/ 2/								
S9--7-1	0-20	Ap	0	43	31	0	26	0
-4	68-94	Bt1	0	31	45	0	24	0
-7	160-203	Cg	0	26	63	0	11	0

See footnotes at end of table.

TABLE 18.--CLAY MINERALOGY OF SELECTED SOILS

Soil name and sample number	Depth	Horizon	Clay minerals					
			Montmorillonite	14-Angstrom intergrade	Kaolinite	Gibbsite	Quartz	Calcite
	Cm		Pct	Pct	Pct	Pct	Pct	Pct
Micanopy loamy fine sand: 6/								
S9-24-1	0-18	Ap	22	28	36	0	14	0
-3	38-53	Bt2	46	19	16	0	19	0
-5	107-147	Btg2	53	23	9	0	15	0
-7	183-203	BCg	73	12	4	0	11	0
Myakka fine sand: 2/								
S9-10-1	0-10	A	0	15	6	0	79	0
-4	68-107	Bh1	31	0	19	0	50	0
-7	170-203	Bh'	0	37	16	0	47	0
Redlevel fine sand: 2/								
S9--1-1	0-8	A1	0	59	16	0	25	0
-5	66-107	Bw3	0	38	32	0	30	0
-6	107-140	Bw4	0	41	31	0	28	0
Sparr fine sand: 7/								
S9-26-1	0-20	Ap	8	41	27	0	24	0
-6	155-180	Btg1	14	26	54	0	6	0
-7	180-203	Btg2	8	21	64	0	7	0
Tavares fine sand: 2/								
S9-12-1	0-8	A	0	41	37	0	22	0
-3	56-104	C1	0	42	50	0	8	0
-5	160-203	C3	0	37	49	0	14	0

1/ This soil is a taxadjunct to the series. See the series description in the section "Soil Series and Their Morphology" for an explanation of those characteristics of the soil that are outside the range of the series.

2/ Typical pedon for the series. Refer to "Soil Series and Their Morphology" for location of pedon.

3/ Astatula fine sand: Pedon is about 3.5 miles west of Florida State Road 495 and 3 miles north of State Road 44; SW1/4NE1/4 sec. 12, T. 18 S., R. 17 E.

4/ Citronelle fine sand: Pedon is about 2 miles west of U.S. Highway 19 and 30 feet east of trails; NW1/4NE1/4 sec. 13, T. 18 S., R. 16 E.

5/ Kendrick loamy fine sand: Pedon is about 2,500 feet west of Florida State Road 581 and 2.7 miles north of County Road 480; SE1/4SW1/4 sec. 13, T. 20 S., R. 19 E.

6/ Micanopy loamy fine sand: Pedon is about 1.8 miles west of Florida State Road 581 and 1,500 feet south of County Road 480; SW1/4SE1/4 sec. 34, T. 20 S., R. 17 E.

7/ Sparr fine sand: Pedon is about 500 feet east of Florida State Road 491 near its junction with Grover Cleveland Boulevard; NE1/4NE1/4 sec. 28, T. 19 S., R. 18 E.

TABLE 19.--ENGINEERING INDEX TEST DATA

[Tests performed by the Florida Department of Transportation (FDOT) in cooperation with the U.S. Bureau of Public Roads, in accordance with standard procedures of the American Association of State Highway and Transportation Officials (AASHTO). NP means nonplastic]

Soil name, sample number, horizon, and depth in inches	Classification		Grain-size distribution								Liquid limit	Plasticity index
			Percentage smaller than--				Percentage smaller than--					
	AASHTO	Unified	No. 4	No. 10	No. 40	No. 200	.05 mm	.02 mm	.005 mm	.002 mm	Pct	
Adamsville fine sand: 1/ S81FL-017-011-(1-5)												
C2 ------ 20-30	A-3(0)	SP	100	100	98	4	3	2	2	2	---	NP
Arredondo fine sand: 1/ S80FL-017-4-(1-5)												
E1 ---- 9-26	A-2-4(0)	SP-SM	100	100	99	12	9	4	3	3	---	NP
Bt2 ---- 65-80	A-2-4(0)	SC	100	100	99	28	27	27	25	25	23	8
Astatula fine sand: 2/ S81FL-017-13-(1-4)												
C2 ------ 18-47	A-3(0)	SP	100	100	98	4	4	4	2	2	---	NP
Astatula fine sand: 2/ S81FL-017-14-(1-4)												
C3 ------ 39-80	A-3(0)	SP	100	100	100	3	3	2	1	1	---	NP
Candler fine sand: 1/ S81FL-017-16-(1-6)												
E3 ------ 35-52	A-3(0)	SP	100	100	98	4	2	0	0	0	---	NP
EauGallie fine sand: 1/ 3/ S81FL-017-9-(1-7)												
E --- 10-22	A-3(0)	SP-SM	100	100	97	5	3	2	0	0	---	NP
Btg1 --- 53-68	A-2-4(0)	SM-SC	100	100	99	25	18	17	15	15	24	4
Fort Meade loamy fine sand: 1/ S81FL-017-15-(1-4)												
C3 ---- 56-80	A-2-4(0)	SM	100	100	97	14	13	12	7	6	---	NP
Kendrick fine sand: 4/ S82FL-017-23-(1-6)												
Bt1 ---- 21-45	A-6(0)	SC	100	100	99	36	34	31	28	27	26	11
BC ---- 61-80	A-6(2)	SC	100	100	99	40	39	37	35	35	33	16
Lake fine sand: 1/ S80FL-017-5-(1-5)												
C1 ------ 7-27	A-2-4(0)	SM	100	100	99	24	12	2	1	0	---	NP
C3 ------ 40-80	A-3(0)	SP-SM	100	100	98	5	4	4	3	3	---	NP
Lochloosa fine sand: 1/ 3/ S80FL-017-7-(1-7)												
E2 ---- 17-27	A-2-4(0)	SM	100	100	98	18	18	8	6	5	---	NP
Micanopy loamy fine sand 5/ S82FL-017-24-(1-7)												
Btg1 --- 21-42	A-7-5(34)	MH	100	100	100	80	75	65	64	63	74	37

See footnotes at end of table.

TABLE 19.--ENGINEERING INDEX TEST DATA--Continued

Soil name, sample number, horizon, and depth in inches	Classification		Grain-size distribution								Liquid limit	Plasticity index
	AASHTO	Unified	Percentage smaller than--				Percentage smaller than--					
			No. 4	No. 10	No. 40	No. 200	.05 mm	.02 mm	.005 mm	.002 mm		
											Pct	
Myakka fine sand: 1/ S81FL-017-10-(1-7)												
Bh1 ---- 27-42	A-3(0)	SP-SM	100	100	97	7	4	1	0	0	---	NP
Redlevel fine sand: 1/ S81FL-017-1-(1-6)												
Bw ----- 15-55	A-3(0)	SP-SM	100	100	99	9	9	9	8	8	---	NP
Sparr fine sand: 6/ S82FL-017-26-(1-7)												
E1 ---- 8-27	A-2-4(0)	SM	100	100	99	14	8	2	1	1	---	NP
Btg1 ---- 61-71	A-2-4(0)	SM	100	100	99	26	20	14	12	12	---	NP
Taveres fine sand: 1/ S81FL-017-12-(1-5)												
C1 ----- 3-41	A-3(0)	SP-SM	100	100	97	5	2	1	1	1	---	NP
C3 ----- 63-80	A-3(0)	SP	100	100	99	4	4	4	2	2	---	NP

1/ Typical pedon for the series. Refer to "Soil Series and Their Morphology" for location of pedon.

2/ Astatula fine sand: Pedon is about 3.5 miles west of Florida State Road 495 and 3 miles north of State Road 44; SW1/4NE1/4 sec. 12, T. 18 S., R. 17 E.

3/ This pedon is a taxadjunct to the series. Refer to "Soil Series and Their Morphology" for an explanation of those characteristics of the soil that are outside the range of the series.

4/ Kendrick loamy fine sand: Pedon is about 2,500 feet west of Florida State Road 581 and 2.7 miles north of County Road 480; SE1/4SW1/4 sec. 13, T. 20 S., R. 19 E.

5/ Micanopy loamy fine sand: Pedon is about 1.8 miles west of Florida State Road 581 and 1,500 feet south of County Road 480; SW1/4SE1/4 sec. 34, T. 20 S., R. 17 E.

6/ Sparr fine sand: Pedon is about 500 feet east of Florida State Road 491 near its junction with Grover Cleveland Boulevard; NE1/4NE1/4 sec. 28, T. 19 S., R. 18 E.

TABLE 20.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Adamsville	Hyperthermic, uncoated Aquic Quartzipsamments
Anclote	Sandy, siliceous, hyperthermic Typic Haplaquolls
Apopka	Loamy, siliceous, hyperthermic Grossarenic Paleudults
Arredondo	Loamy, siliceous, hyperthermic Grossarenic Paleudults
Astatula	Hyperthermic, uncoated Typic Quartzipsamments
Basinger	Siliceous, hyperthermic Spodic Psammaquents
Boca	Loamy, siliceous, hyperthermic Arenic Ochraqualfs
Broward	Hyperthermic, uncoated Aquic Quartzipsamments
Candler	Hyperthermic, uncoated Typic Quartzipsamments
Citronelle	Hyperthermic, coated Lithic Quartzipsamments
Durbin	Euic, hyperthermic Typic Sulfihemists
*EauGallie	Sandy, siliceous, hyperthermic Alfic Haplaquods
Fort Meade	Sandy, siliceous, hyperthermic Quartzipsammentic Haplumbrepts
Hallandale	Siliceous, hyperthermic Lithic Psammaquents
Homosassa	Sandy, siliceous, hyperthermic Typic Sulfaquents
Immokalee	Sandy, siliceous, hyperthermic Arenic Haplaquods
Kanapaha	Loamy, siliceous, hyperthermic Grossarenic Paleaquults
Kendrick	Loamy, siliceous, hyperthermic Arenic Paleudults
Lacoochee	Siliceous, hyperthermic, shallow Spodic Psammaquents
Lake	Hyperthermic, coated Typic Quartzipsamments
Lauderhill	Euic, hyperthermic Lithic Medisaprists
*Lochloosa	Loamy, siliceous, hyperthermic Aquic Arenic Paleudults
Malabar	Loamy, siliceous, hyperthermic Grossarenic Ochraqualfs
Matlacha	Sandy, siliceous, hyperthermic Udalfic Arents
Micanopy	Fine, mixed, hyperthermic Aquic Paleudalfs
Myakka	Sandy, siliceous, hyperthermic Aeric Haplaquods
Okeelanta	Sandy or sandy-skeletal, siliceous, euic, hyperthermic Terric Medisaprists
Ona	Sandy, siliceous, hyperthermic Typic Haplaquods
Orsino	Hyperthermic, uncoated Spodic Quartzipsamments
Paisley	Fine, montmorillonitic, hyperthermic Typic Albaqualfs
Paola	Hyperthermic, uncoated Spodic Quartzipsamments
Pedro	Fine-loamy, siliceous, hyperthermic, shallow Typic Hapludalfs
Pineda	Loamy, siliceous, hyperthermic Arenic Glossaqualfs
Pomello	Sandy, siliceous, hyperthermic Arenic Haplohumods
Pompano	Siliceous, hyperthermic Typic Psammaquents
Quartzipsamments	Hyperthermic, uncoated Quartzipsamments
Redlevel	Hyperthermic, coated Aquic Quartzipsamments
Sparr	Loamy, siliceous, hyperthermic Grossarenic Paleudults
Tavares	Hyperthermic, uncoated Typic Quartzipsamments
Terra Ceia	Euic, hyperthermic Typic Medisaprists
Udorthents	Hyperthermic Udorthents
Weekiwachee	Euic, hyperthermic Terric Sulfihemists
Williston	Fine, mixed, hyperthermic Typic Hapludalfs

* The soil is a taxadjunct to the series. See text for description of those characteristics of the soil that are outside the range of the series.

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