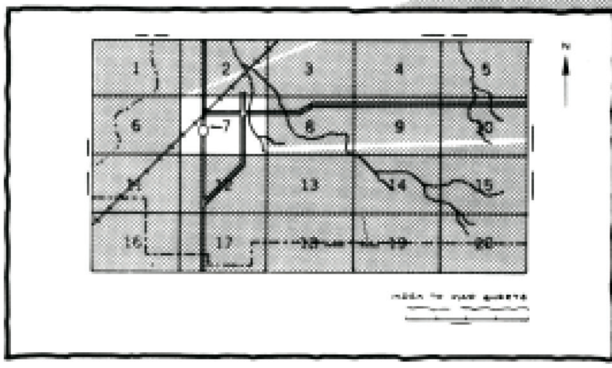
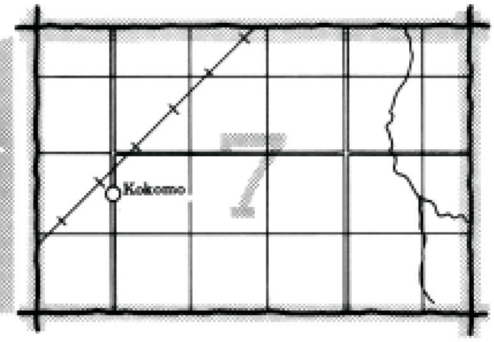
SOIL SURVEY OF
CAMDEN and GLYNN COUNTIES, GEORGIA

United States Department of Agriculture
Soil Conservation Service
in cooperation with the
University of Georgia, College of Agriculture, Agricultural Experiment Stations

HOW TO USE

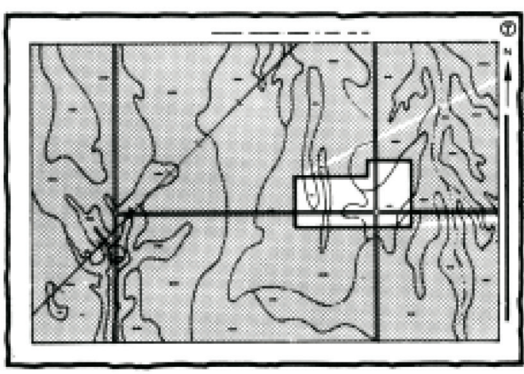
1. Locate your area of interest on the "Index to Map Sheets"

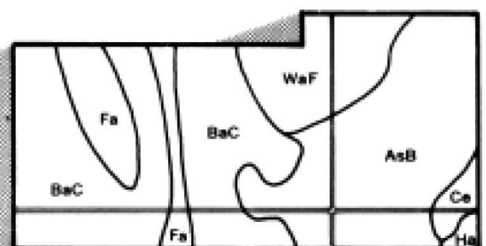




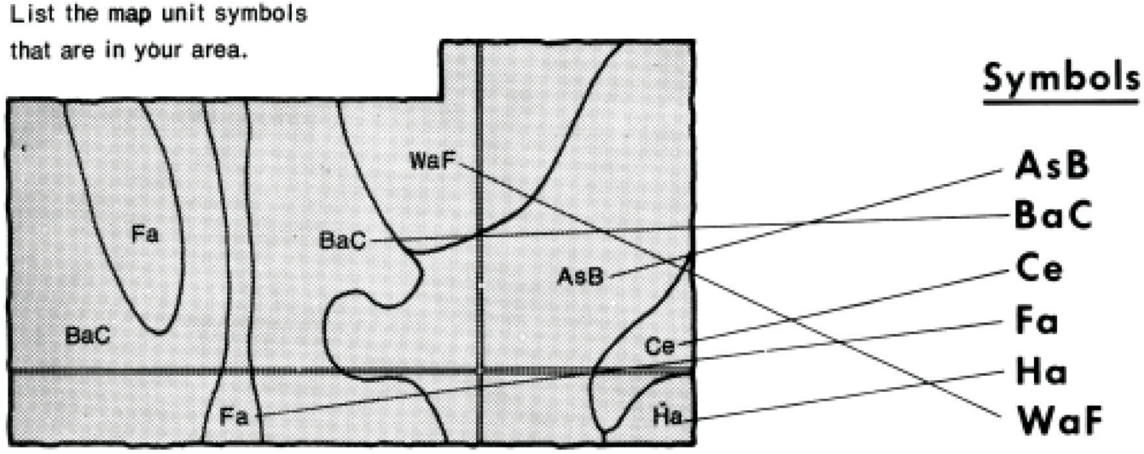
2. Note the number of the map sheet and turn to that sheet.

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



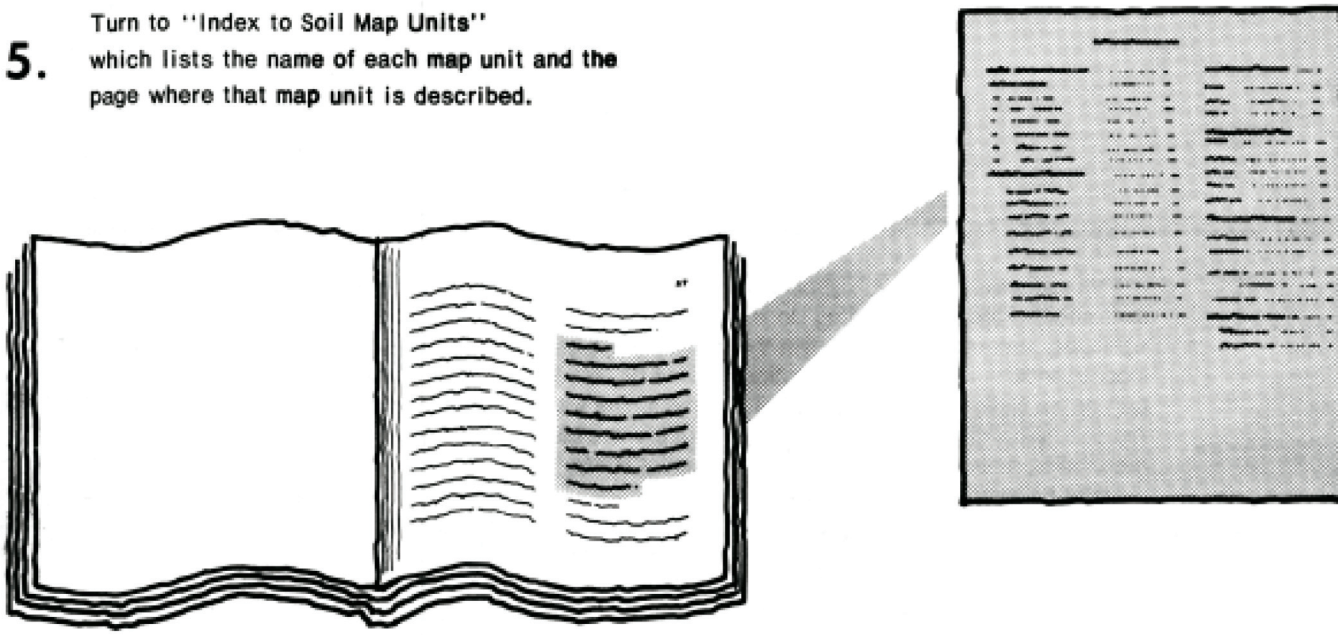


4. List the map unit symbols that are in your area.

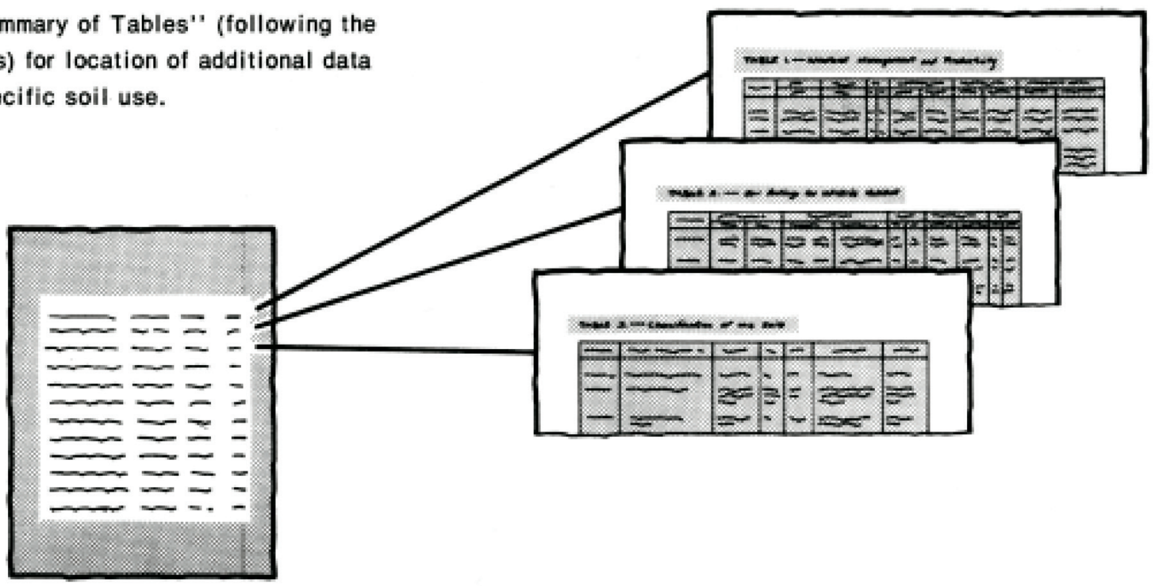


THIS SOIL SURVEY

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



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



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

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

Major fieldwork for this soil survey was completed in the period 1968-77. Soil names and descriptions were approved in 1977. Unless otherwise indicated, statements in the publication refer to conditions in the survey area in 1977. This survey was made cooperatively by the Soil Conservation Service and the University of Georgia, College of Agriculture, Agricultural Experiment Stations. It is part of the technical assistance furnished to the Satilla River Soil and Water Conservation District.

Soil maps in this survey may be copied without permission, but any enlargement of these maps could cause misunderstanding of the detail of mapping and result in erroneous interpretations. Enlarged maps do not show small areas of contrasting soils that could have been shown at a larger mapping scale.

Cover: Typical landscape in Camden and Glynn Counties. Mandarin soils are in woodland. Open areas are mostly Bohicket and Capers soils. (Photo by John R. Bozeman, Georgia Department of Natural Resources.)

Contents

Issued November 1980

Index to soil map units

Summary of tables

Summary of tables—Continued

Foreword

This soil survey contains much information useful in land-planning programs in Camden and Glynn Counties, Georgia. Of prime importance are the predictions of soil behavior for selected land uses. Also highlighted are limitations or hazards to land uses that are inherent in the soil, improvements needed to overcome these limitations, and the impact that selected land uses will have on the environment.

This soil survey has been prepared for many different users. Farmers, ranchers, foresters, and agronomists can use it to determine the potential of the soil and the management practices required for food and fiber production. Planners, community officials, engineers, developers, builders, and homebuyers can use it to plan land use, select sites for construction, develop soil resources, or identify any special practices that may be needed to insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the soil survey to help them understand, protect, and enhance the environment.

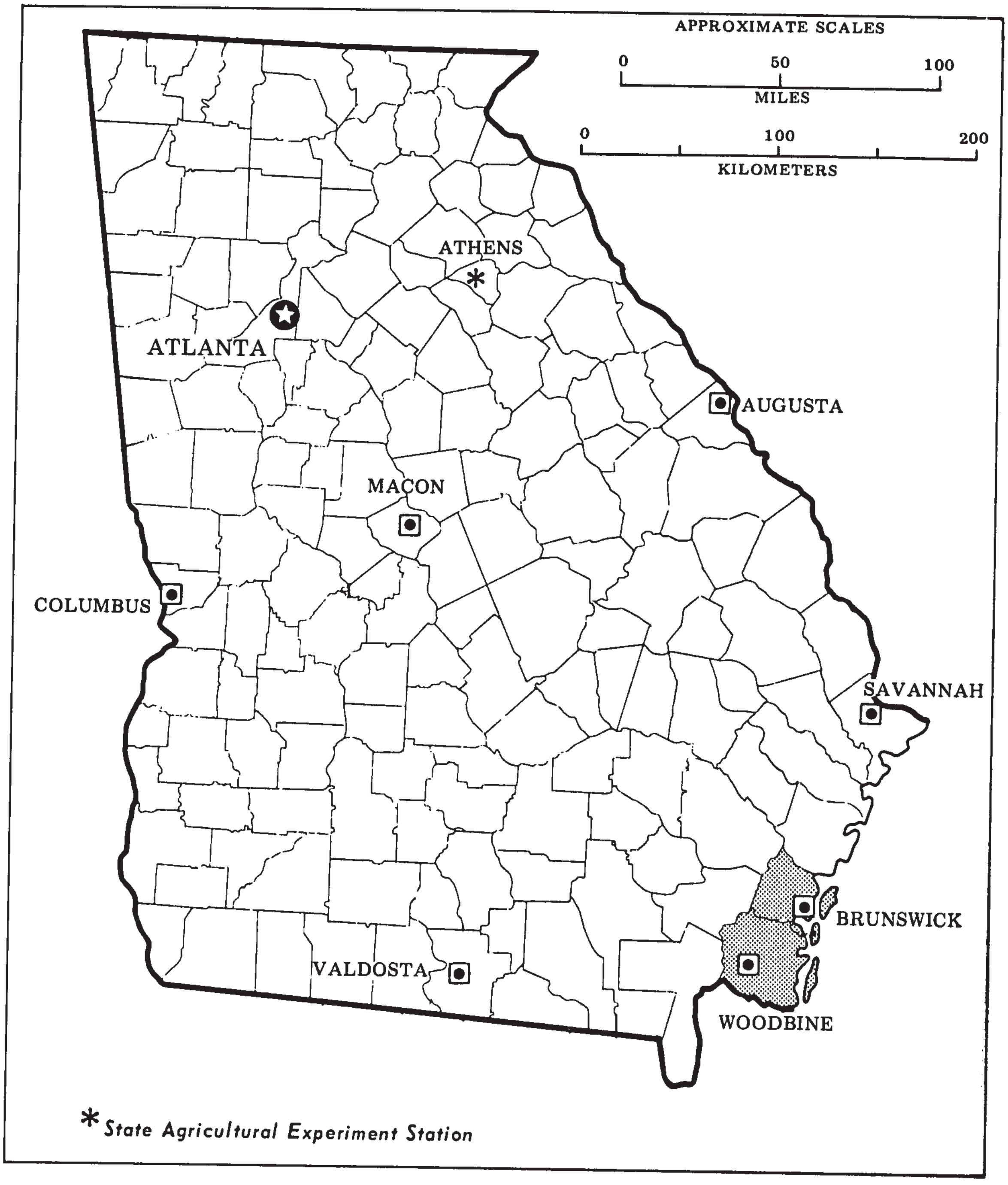
Great differences in soil properties can occur even within short distances. Soils may be seasonally wet or subject to flooding. They may be shallow to bedrock. They may be too unstable to be used as a foundation for buildings or roads. Very clayey or wet soils are poorly suited to septic tank absorption 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 kind of soil is shown on detailed soil maps. Each kind of soil in the survey area is described, and much information is given about each soil for specific uses. Additional information or assistance in using this publication can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

This soil survey can be useful in the conservation, development, and productive use of soil, water, and other resources.

Dwight M. Treadway

Dwight M. Treadway
State Conservationist
Soil Conservation Service



Location of Camden and Glynn Counties in Georgia.

SOIL SURVEY OF CAMDEN AND GLYNN COUNTIES, GEORGIA

By Thomas A. Rigdon and Alfred J. Green, Soil Conservation Service

Fieldwork by Thomas A. Rigdon, Alfred J. Green, and Howard T. Stoner, Soil Conservation Service. D. Gray Aydelott, Robert L. Wilkes, John H. Johnson, and Marian M. Blevins, Soil Conservation Service, assisted in the fieldwork.

United States Department of Agriculture, Soil Conservation Service in cooperation with the University of Georgia, College of Agriculture, Agricultural Experiment Stations

CAMDEN AND GLYNN COUNTIES are the two southernmost counties on the Georgia coast. Together, they cover an area of 681,856 acres, or 1,065 square miles. Camden County, which borders Florida, occupies 417,920 acres, or 653 square miles. It has a population of 11,334. Woodbine, the county seat, has a population of 1,003. Glynn County occupies 263,936 acres, or 412 square miles. It has a population of 50,528. Brunswick, the county seat, has a population of 19,585.

Camden and Glynn Counties are in the Atlantic Coast Flatwoods Major Land Resource Area. They are drained mainly by the Altamaha, Satilla, and St. Marys Rivers and their tributaries. The St. Marys River is the southern boundary of Camden County; the Altamaha River is the northern boundary of Glynn County.

Much of the western half of the survey area is nearly level and is characterized by somewhat poorly drained soils on slight ridgetops and somewhat poorly drained and poorly drained soils on broad flats and in drainageways. In places, very poorly drained soils are in depressions. This nearly level landscape is referred to locally as the Flatwoods. In most of the eastern part of the survey area, level, very poorly drained soils cover wide areas of saltwater marshes and estuaries. Some of these soils extend inland along creeks and rivers. Somewhat excessively drained and excessively drained soils occupy nearly level and gently sloping ridgetops and undulating to rolling dunes, mainly on barrier islands near the Atlantic Ocean.

The predominant somewhat poorly drained soils on ridges are in the Mandarin and Pottsburg series. These soils are sandy throughout and commonly have a grayish surface layer and subsurface layer over a black or brownish organic hardpan. The predominant poorly drained soils on flats and in drainageways are in the Bladen, Meggett, Pelham, and Sapelo series. These soils commonly are grayish throughout and have brown, red, or yellow mottles in the subsoil. They have a loamy or sandy surface layer and mainly a clayey subsoil. In places, however, a fine sand organic hardpan underlies the sandy surface layer. Very poorly drained Brookman and Rutlege soils are in depressions of the Flatwoods. These soils have a black surface layer and predominantly gray underlying layers that have brown and yellow mottles. They have a loamy or sandy surface layer and clayey or sandy underlying layers. Very poorly drained Bohicket and Capers soils are in marshes. These soils are gray throughout and are predominantly clayey. The excessively drained Fripp soils and the somewhat excessively drained Cainhoy soils are sandy throughout. These soils have grayish or brownish surface layers and mainly brown, yellow, and white underlying layers.

Slightly more than 75 percent of the total land area in Camden and Glynn Counties is commercial forest used mainly for the production of pulpwood. Less than 1 percent of the area is farmland. Corn, small grains, and vegetables are the main crops. Improved bermudagrass and bahiagrass are produced for pasture.

Wildlife habitat is abundant throughout the survey area. The large acreage of woodland and the availability of water are conducive to many kinds of wildlife. About 5 percent of the total land area is in urban uses. Most urban areas are near Brunswick, Kingsland, Woodbine, and St. Marys.

General nature of the counties

This section gives general information concerning the counties. It describes the climate, settlement, natural resources, farming, and geology.

Climate

Camden and Glynn Counties are hot and humid in summer, but the coast is frequently cooled by sea breezes. Winters are cool, with occasional brief cold spells. Rains occur throughout the year and are fairly heavy; snowfall is rare. Annual precipitation is adequate for all crops.

Table 1 gives data on temperature and precipitation for the survey area, as recorded at Brunswick for the period 1951 to 1975. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 53 degrees F, and the average daily minimum temperature is 43 degrees. The lowest temperature on record, which occurred at Brunswick on December 13, 1962, is 14 degrees. In summer the average temperature is 81 degrees, and the average daily maximum temperature is 88 degrees. The highest recorded temperature, which occurred on June 26, 1952, is 101 degrees.

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

Of the total annual precipitation, 33 inches, or 65 percent, usually falls in April through September, which includes the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 27 inches. The heaviest 1-day rainfall during the period of record was 12.36 inches at Brunswick on August 22, 1969. There are about 65 thunderstorms each year, and most occur in summer.

Snowfall is rare; in 90 percent of the winters, there is no measurable snowfall. In 5 percent, the snowfall, usually of short duration, is more than 2 inches. The heaviest 1-day snowfall on record was more than 2 inches.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 90 percent. The percentage of possible sunshine is 60 in summer and 60 in winter. The prevailing wind is from the northwest. Average windspeed is highest, 10 miles per hour, in spring. Every few years a hurricane crosses the area.

Climatic data in this section were specially prepared for the Soil Conservation Service by the National Climatic Center, Asheville, North Carolina.

Settlement

A French explorer, Ribault, reportedly visited in 1562 the area that is now Camden and Glynn Counties. He described it as a country full of havens, rivers, and islands.

The French built forts in the area. The Spanish later destroyed these forts and built missions on the mainland and the islands. In 1663, the English Crown claimed Georgia. The British General Oglethorpe established Fort Frederica on St. Simons Island in 1736 and shortly thereafter built two forts on Cumberland Island.

Camden and Glynn Counties were formed in 1777 by English Crown Grants of land from the colonial parishes of St. David, St. James, St. Marys, and St. Patrick. Camden County was named for the Earl of Camden, Chief Justice and Lord Chancellor of England. Glynn County was named in honor of John Glynn, a member of the British House of Commons who had defended the cause of the American Colonies. Camden and Glynn became two of the original eight counties in Georgia, and parts of Camden County were later used to form Wayne and Charlton Counties.

Settlement of Camden and Glynn Counties advanced slowly until the timber resources began to be used. Then, for a century, this was one of the principal lumber areas in the country. Europe was the major market, and an interesting reminder of this trade is the large number of rocks of all kinds that were brought here from the Old World as ballast. These rocks were left on the islands and along the rivers as the vessels were loaded with lumber for the return trip. Locally, logs were cut for construction of navy vessels.

Plantations were established in the 1800's and increased settlement. Camden County had a population of 305 in 1790 and 5,482 in 1845. Glynn County had a population of 413 in 1791 and 5,302 in 1840. By 1900 the population was 7,669 in Camden County and 14,317 in Glynn County.

During this century, industry and military bases have come into the area, and the population has further increased. In 1970 the population of Camden County was 11,334, and the population of Glynn County was 50,528.

Today, forestry and industry are the main enterprises in Camden and Glynn Counties. The counties have many ground transportation routes to local and out-of-state markets, including a railroad line. Air transportation is also available.

Natural resources

Soil is the most important resource in Camden and Glynn Counties. Well-managed soils produce abundant wood crops, and many of the soils in these counties have high potential for forestry. The counties have two pulp mills and several industries that require a wood supply.

Deep wells drilled into the limestone strata produce abundant water for Camden and Glynn Counties. The Altamaha, St. Marys, and Satilla Rivers are permanent streams that also provide water. There are many bodies of water that provide opportunities for fishing, shrimping, and recreation.

Wildlife is important in the two counties. Deer, raccoon, squirrel, and many songbirds and nongame animals are common in the wooded areas. Rabbits and wetland wildlife are numerous, particularly on the poorly drained and very poorly drained soils.

Farming

Agricultural development in Camden and Glynn Counties was slight until after 1800, when plantations were started. Cotton and rice were the principal crops. Sea Island cotton was grown mainly on the coastal islands, and rice was grown in the low marshy soils along the rivers. Cattle and hogs were an important addition to farming. During this period, this part of Georgia was one of the most intensively farmed areas in the United States.

Production of vegetable and fruit crops was important from the beginning. In the early 1600's, the Spaniards grew many fruits, including oranges, figs, and pomegranates, on the coastal islands. Watermelons, turnips, pumpkins, and potatoes were also important crops.

Farming steadily decreased and the plantation period ended because of the abolition of slavery, low yields, and high maintenance costs of dikes and levees.

According to the 1974 Agricultural Stabilization and Conservation Service Annual Report, farmland covered 1,457 acres in Camden County and 1,688 acres in Glynn County. These counties now produce mainly corn, small grains, squash, cabbage, improved bermudagrass, and bahiagrass. The acreage in blueberries is increasing, particularly in Camden County.

The 1969 Census of Agriculture indicated that in 1949 Camden County had a total of 240 farms and these farms averaged 545 acres. By 1969 the number of farms had decreased to 58 and the average size had increased to 965 acres. In 1949 Glynn County had a total of 145 farms and these farms averaged 600 acres. By 1969 the number of farms had decreased to 126 and the average size was 358 acres.

Sales of timber and agricultural products produce a large part of the income in the two counties. The sale of seafood is also important.

Most of the soils have poor potential for row crops because of wetness. About 18,000 acres, or about 2.5 percent of the survey area, does not have wetness limitations.

Geology

Camden and Glynn Counties were greatly influenced by the raising and lowering of the sea during the Pleistocene and Holocene epochs of the Quaternary Period. Glaciers repeatedly advanced and retreated in the northern part of the United States and, although the great ice sheets did not reach Georgia, influences of the melted ice are evident in the Shoreline Complexes.

These complexes were deposited as the sea was at different levels in response to changes in climate, and each Shoreline Complex is at a lower elevation seaward. The Shoreline Complexes have not been accurately dated, but the Holocene is estimated to be 4,000 to 5,000 years old and the Silver Bluff is estimated to be 25,000 to 36,000 years old (*4*).

Five Shoreline Complexes have been identified in the survey area. The oldest is the highest on the landscape. Conversely, the youngest is the lowest on the landscape (*3*).

The Talbot is the oldest and highest Shoreline Complex and commonly ranges from 35 to 45 feet above sea level. It is in the western part of the survey area along the post road.

The Pamlico Shoreline Complex generally ranges from 15 to 35 feet above sea level. It covers most of the survey area and consists chiefly of clayey and sandy materials.

The Princess Ann Shoreline Complex is 10 to 15 feet above sea level. It is on low upland ridges just west of the salt marsh. It is not as sharply defined and developed as the others, which indicates that the sea was at this level for a relatively short time.

The Silver Bluff Shoreline Complex is 6 to 10 feet above sea level. It contains the intercoastal flats, the salt marshes, and the offshore barrier islands. Parts of the barrier islands formed in recent times. More recent deposits, however, are on the flood plains of the major streams. These flood plain deposits are of Coastal Plain origin, except deposits along the Altamaha River that have sediments mixed with Coastal Plain and Piedmont materials.

The Holocene is the youngest Shoreline Complex and was probably formed within the past 4,000 to 5,000 years. It is on the seaward side of the barrier islands. Sea Island and Little Cumberland are examples of this Shoreline Complex.

How this survey was made

Soil scientists made this survey to learn what kinds of soil are in the survey area, where they are, and how they can be used. The soil scientists went into the area knowing they likely would locate many soils they already knew something about and perhaps identify some they had never seen before. They observed the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; the kinds of native plants or crops; the kinds of rock; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material, which has been changed very little by leaching or by the action of plant roots.

The soil scientists recorded the characteristics of the profiles they studied, and they compared those profiles with others in counties nearby and in places more distant. Thus, through correlation, they classified and named the soils according to nationwide, uniform procedures.

After a guide for classifying and naming the soils was worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, roads, and other details that help in drawing boundaries accurately. The soil map at the back of this publication was prepared from aerial photographs.

The areas shown on a soil map are called soil map units. Some map units are made up of one kind of soil, others are made up of two or more kinds of soil, and a few have little or no soil material at all. Map units are discussed in the sections "General soil map for broad land use planning" and "Soil maps for detailed planning."

While a soil survey is in progress, samples of soils are taken as needed for laboratory measurements and for engineering tests. The soils are field tested, and interpretations of their behavior are modified as necessary during the course of the survey. New interpretations are added to meet local needs, mainly through field observations of different kinds of soil in different uses under different levels of management. Also, data are assembled from other sources, such as test results, records, field experience, and information available from state and local specialists. For example, data on crop yields under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soil.

But only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information is then organized and published so that it is readily available to different groups of users, among them farmers, managers of rangeland and woodland, engineers, planners, developers and builders, homebuyers, and those seeking recreation.

General soil map for broad land use planning

The general soil map at the back of this publication shows, in color, map units that have a distinct pattern of soils and of relief and drainage. Each map unit 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 provides a broad perspective of the soils and landscapes in the survey area. It provides a basis for comparing the potential of large areas for general kinds of land use. Areas that are, for the most part, suited to certain kinds of farming or to other land uses can be identified on the map. Likewise, areas of soils having properties that are distinctly unfavorable for certain land uses can be located.

Because of its small scale, the map does not show the kind of soil at a specific site. Thus, it is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The kinds of soil in any one map unit differ from place to place in slope, depth, stoniness, drainage, or other characteristics that affect their management.

The soils in the survey area vary in their potential for major land uses. General ratings of the potential of each, in relation to the other map units, are given for major land uses. Soil properties that pose limitations to the use are indicated. The ratings of soil potential are based on the assumption that practices in common use in the survey area are being used to overcome soil limitations. These ratings reflect the ease of overcoming the soil limitations and the probability of soil problems persisting after such practices are used.

Map units are given potential ratings for cultivated crops, woodland, urban uses, wildlife habitats, and recreation areas. Cultivated crops are those grown extensively by farmers in the survey area. Woodland refers to land that is producing either trees native to the area or introduced species. Urban uses include residential, commercial, and industrial developments. Wildlife habitats depend largely on the amount and distribution of food, cover, and water available to wildlife. Recreation areas include campsites, picnic areas, ballfields, and areas used for nature study and as wilderness.

Camden County

There are eight general soil map units in Camden County. These are further grouped according to slope and landscape.

Level soils on flood plains

These two map units consist of very poorly drained soils on flood plains adjacent to major streams. The soils have a grayish loamy surface layer underlain by brownish organic material or a surface layer of dark reddish brown organic material underlain by predominantly brownish organic material. These units are mainly along the Little Satilla, Satilla, and St. Marys Rivers.

1. Satilla

Level soils that have a loamy surface layer over organic material, on flood plains

This map unit consists of very poorly drained soils on broad flood plains that are influenced by the tide. Slope is less than 1 percent. Areas of this unit are on the flood plain of the Satilla River.

This unit covers about 5 percent of Camden County. Satilla soils make up about 95 percent of the unit, and minor soils about 5 percent.

Typically, Satilla soils have a surface layer about 24 inches thick. The upper 5 inches is very dark gray loam.

Below that it is sandy clay loam that is predominantly very dark gray, mottled with dark grayish brown. This is underlain, to a depth of 65 inches or more, by very dark brown organic material that contains many stumps, logs, and roots.

The minor soils in this unit are Kingsland and Meggett soils. Very poorly drained Kingsland soils are on flood plains that are subject to daily flooding by the tide. Poorly drained Meggett soils are on broad, low terraces and flood plains.

This unit is used mainly as habitat for wildlife. Much of this unit had been diked and used for farming, but has reverted to giant cutgrass, big cordgrass, and maidencane. Thick stands of blackgum, bay, cypress, and other water-tolerant trees grow on the rest. This unit has good potential as habitat for openland and woodland wildlife. Potential is poor as habitat for wetland wildlife. The surface layer is commonly dry during the summer, and wetland areas are difficult to maintain. Potential is fair for woodland production. Equipment limitations and seedling mortality are management problems. This unit has poor potential for farming and urban use. Wetness is the primary concern in managing this unit for most uses.

2. Kingsland

Level soils that are organic throughout, on flood plains

This map unit consists of very poorly drained soils on long, narrow flood plains that are subject to daily flooding by the tide. Slope is less than 1 percent. Areas of this unit are on the flood plain of the Little Satilla River and the St. Marys River.

This unit covers about 4 percent of Camden County. Kingsland soils make up about 88 percent of the unit, and minor soils about 12 percent.

Typically, Kingsland soils have a surface layer of dark reddish brown mucky peat about 10 inches thick. Next, to a depth of 20 inches, is black mucky peat. Below this, to a depth of 65 inches or more, is very dark brown mucky peat.

The minor soils in this unit are Brookman and Meggett. Brookman and Meggett soils formed in clayey sediment. The very poorly drained Brookman soils are in broad, shallow depressions on marine terraces. Poorly drained Meggett soils are on flood plains and broad, low terraces.

This unit is used mainly as habitat for wildlife. The vegetation is chiefly water-loving hardwoods, such as blackgum, tupelo, cypress, water oak, and ash. This unit has good potential as habitat for wetland wildlife. Potential is poor for most other uses. Flooding and wetness are the primary concerns for use and management.

Nearly level or gently sloping soils on ridges and flats and in depressions and drainageways

These two map units consist of soils that are sandy throughout. Commonly, somewhat excessively drained soils that have a grayish surface layer over layers that are brown, gray, white, and yellow are on the slightly higher ridges. Somewhat poorly drained soils that have a grayish surface layer and a thick mottled subsurface layer over a brown or black organic hardpan layer are on lower ridges and flats. Very poorly drained soils that have a black surface layer and mainly grayish underlying layers are in depressions and drainageways. These units are in the east-central and extreme western part of Camden County and on the coastal islands.

3. Mandarin-Rutlege

Nearly level soils that are sandy throughout, on ridges and flats and in depressions and drainageways

This map unit consists of soils on marine terraces. Somewhat poorly drained soils are on slight ridges and broad flats. Very poorly drained soils are in poorly defined drainageways and shallow depressions. Slope is mainly less than 1 percent. Areas of this unit are in the east-central and extreme western part of Camden County and on the coastal islands.

This unit covers about 24 percent of the county. Mandarin soils make up about 59 percent of the unit; Rutlege soils, about 21 percent; and minor soils, about 20 percent.

The Mandarin soils are somewhat poorly drained and are on ridges and flats. Typically, these soils are fine sand throughout. The surface layer is very dark gray about 3 inches thick. The subsurface layer is predominantly light gray and extends to a depth of 19 inches. It is underlain by a weakly cemented organic hardpan that extends to a depth of 34 inches. This hardpan is black in the upper part, very dark brown in the middle part, and dark brown in the lower part. Beneath the hardpan, to a depth of 62 inches, are light gray, white, and grayish brown layers. These layers are underlain by a second weakly cemented organic hardpan that is black and extends to a depth of 80 inches or more.

The Rutlege soils are very poorly drained and are in depressions and drainageways. Typically, these soils are fine sand throughout. The surface layer is predominantly black and is about 15 inches thick. The underlying material to a depth of 70 inches or more is light gray mottled with brownish gray in the upper part, light brownish gray in the middle part, and grayish brown mottled with very dark grayish brown in the lower part.

The minor soils in this unit are in the Cainhoy, Pelham, and Pottsburg series. Somewhat excessively drained, nearly level and gently sloping Cainhoy soils are on ridges. Poorly drained Pelham soils are on broad flats and in depressions and drainageways. Somewhat poorly drained Pottsburg soils are on low ridges.

This unit is used mainly for woodland. Slash pine and longleaf pine are on the ridges and broad flats. Sand pine, blackgum, bays, and a few cypress are in the depressions and drainageways. The major soils on the higher areas of this unit have fair potential for the locally grown pines; potential is good for loblolly pine and slash pine on the soils in shallow depressions and drainageways. This unit has poor potential for most other uses. Wetness is the primary concern for use and management. Soils in the depressions and drainageways are commonly inundated for brief periods, and flooding is an additional concern.

4. Pottsburg-Cainhoy

Nearly level or gently sloping soils that are sandy throughout, on ridges

This map unit consists of soils on marine terraces. Somewhat poorly drained, nearly level soils are in lower areas adjacent to somewhat excessively drained, nearly level or gently sloping soils on slightly higher ridges. Slope is 5 percent or less. This unit is on Cumberland Island and in the extreme western part of Camden County.

This unit covers about 3 percent of the county. Pottsburg soils make up about 50 percent of the unit; Cainhoy soils, about 35 percent; and minor soils, about 15 percent.

The Pottsburg soils are somewhat poorly drained and are nearly level. Typically, these soils are sand throughout. The surface layer is gray and about 4 inches thick. The subsurface layer extends to a depth of 63 inches. It is light gray with brownish yellow and brown mottles in the upper part and white with brownish yellow and dark grayish brown mottles in the lower part. Below this a weakly cemented, dark brown organic hardpan extends to a depth of 80 inches or more.

The Cainhoy soils are somewhat excessively drained and are nearly level and gently sloping. Typically, the surface layer is dark gray fine sand about 5 inches thick. The underlying layers, to a depth of 120 inches, are fine sand. The upper 18 inches of the underlying material is brownish yellow. Below this is a very pale brown layer to a depth of 50 inches. Next are light gray and white layers to a depth of 101 inches. Below these is a black and dark reddish brown layer to a depth of 120 inches.

The minor soils in this unit are Duckston, Fripp, and Mandarin soils. Poorly drained Duckston soils are in shallow depressions between dunes and on flats between dunes and marshes. Excessively drained Fripp soils are on undulating and rolling dunes. Somewhat poorly drained Mandarin soils are on slight ridges and broad flats.

This unit is used mainly for community development and recreation. Longleaf pine and live oaks are in most areas that have not been cleared for urban purposes. The soils on the lower landscapes have poor potential for urban uses because of wetness. Soils on the higher areas, however, have good potential for most urban uses. The soils in the unit are sandy throughout, and potential is poor for most recreational purposes and most other uses. Wetness on the lower landscapes and low available water capacity on the slightly higher areas are the main concerns for use and management.

Nearly level soils on flats, flood plains, and terraces and in depressions and drainageways

These two map units consist of poorly drained soils on flats, flood plains, and terraces. The landscape also includes poorly drained and very poorly drained soils in depressions and drainageways. The poorly drained soils are grayish throughout and have a loamy or sandy surface layer and a clayey or loamy subsoil. The very poorly drained soils have a black loamy surface layer and a grayish clayey subsoil. These units are in the west and west-central part of Camden County.

5. Bladen-Brookman-Meggett

Nearly level soils that have a loamy surface layer and a clayey subsoil, on flats and terraces and in depressions

This unit consists of soils that are subject to flooding during winter and spring. Poorly drained soils are commonly on low flats, low terraces, and flood plains. Very poorly drained soils are in broad, shallow depressions. Slope is mainly 1 percent or less. Areas of this unit are in the western part of Camden County.

This unit covers about 22 percent of the county. Bladen soils make up about 41 percent of the unit; Brookman soils, about 36 percent; Meggett soils, about 19 percent; and minor soils, about 4 percent.

The Bladen soils are poorly drained and are on low flats. Typically, the surface layer is dark gray loam about 5 inches thick. The subsoil is clay and extends to a depth of 65 inches or more. The upper part of the subsoil is gray and has yellowish brown mottles; the lower part is light gray and has dominantly yellowish brown and yellowish red mottles.

The Brookman soils are very poorly drained and are in depressions. Typically, the surface layer is about 15 inches thick. The upper part of the surface layer is black clay loam, and the lower part is very dark gray clay. The subsoil is clay that extends to a depth of 65 inches or more. The upper part of the subsoil is dark gray with brownish yellow mottles, the middle part is grayish brown with brownish yellow and gray mottles, and the lower part is coarsely mottled gray, yellowish brown, and greenish gray.

The Meggett soils are poorly drained and are on low terraces. Typically, the surface layer is dark gray fine sandy loam about 5 inches thick. The subsurface layer, about 3 inches thick, is gray fine sandy loam mottled with yellowish brown. The subsoil extends to a depth of 65 inches or more. The upper part of the subsoil is sandy clay and clay mottled with gray and strong brown and is greenish gray on the surface of the peds. The middle part is light olive brown clay mottled with yellowish brown. The lower part is gray sandy clay mottled with yellowish brown.

The minor soil in this unit is in the Rains series. Poorly drained Rains soils are on broad flats and in shallow depressions and drainageways.

This unit is used mainly for woodland. Loblolly pine and sweetgum are on the low flats. Blackgum, bays, cypress, water oaks, and sand pine are in the depressions and drainageways and on flood plains. This unit has good potential for the locally grown pines and as habitat for wetland wildlife. Potential is poor for most other uses. Wetness and flooding are the primary concerns for use and management.

6. Pelham-Sapelo

Nearly level soils that have a sandy surface layer over sandy and loamy underlying layers, on flats and in depressions and drainageways

This map unit consists of poorly drained soils on broad flats and in depressions and drainageways. Slope is mainly 1 percent or less. Areas of this unit are in the west-central part of Camden County.

This unit covers about 21 percent of the county. Pelham soils make up about 46 percent of the unit; Sapelo soils, about 32 percent; and minor soils, about 22 percent.

Pelham soils are on flats and in depressions and drainageways. Typically, the surface layer is very dark gray loamy sand about 7 inches thick. The subsurface layer is grayish brown loamy sand about 18 inches thick. The subsoil is gray and extends to a depth of 75 inches or more. The upper part of the subsoil is mainly sandy clay loam with yellow and red mottles, and the lower part is sandy clay with yellow, red, and gray mottles.

Sapelo soils are on flatwood areas that border depressions and drainageways. Typically, the surface layer is black fine sand about 4 inches thick. The subsurface layer is light gray fine sand that extends to a depth of 17 inches. It is underlain by a weakly cemented fine sand organic hardpan that is predominantly dark brown mottled with dark reddish brown, dark brown, and yellowish brown. This hardpan extends to a depth of 25 inches. Next, to a depth of 49 inches, is a layer of pale yellow fine sand mottled with strong brown and light yellowish brown. Underlying this layer is a subsoil of light gray sandy clay loam mottled with yellowish brown and red to a depth of 84 inches or more.

The minor soils in this unit are in the Albany, Bladen, Brookman, and Olustee series. Somewhat poorly drained Albany soils are on low ridgetops. Poorly drained Bladen soils are on broad, low flats and in small isolated depressions. Very poorly drained Brookman soils are in broad, shallow depressions. Poorly drained Olustee soils are on convex ridgetops that are somewhat lower than the better drained Albany soils.

This unit is used mainly for woodland. Loblolly pine, slash pine, sweetgum, and water oak are dominant on flatwood areas. Sand pine is in the depressions and drainageways. The soils on the flats and low ridgetops of this unit have fair potential for the locally grown pines; potential is good for loblolly pine and slash pine on the soils in depressions and drainageways. This unit has fair potential as habitat for most kinds of wildlife. Potential is poor for most other uses. Wetness is the primary concern for use and management. In addition, flooding is a problem on the soils in depressions and drainageways.

Level to rolling soils on dunes and flats and in depressions, and nearly level beaches

This map unit consists of soils that are sandy throughout. Somewhat excessively drained soils are on undulating and rolling dunes adjacent to poorly drained soils in depressions and on flats. Commonly, sandy ocean beaches lie immediately east of the dunes. The soils on dunes have a brownish surface layer; the underlying material is brown and white. Soils in depressions and on flats are grayish throughout. This unit is on Cumberland Island.

7. Fripp-Duckston-Beaches

Level to rolling soils that are sandy throughout, on dunes and flats and in depressions, and sandy beaches

This map unit consists of excessively drained soils on undulating and rolling dunes and poorly drained soils in shallow depressions between the dunes and on flats between the dunes and marshes. The eastern part of the unit consists of beaches that are covered twice each day by the tide, and the shores are continuously changing in extent and shape. Slope ranges from 0 to 20 percent. This unit is on Cumberland Island.

This unit covers about 1 percent of Camden County. Fripp soils make up about 60 percent of the unit; Duckston soils, about 20 percent; Beaches, about 16 percent; and minor soils, about 4 percent.

The Fripp soils are excessively drained and are on undulating and rolling dunes. Typically, the surface layer is grayish brown fine sand about 6 inches thick. The underlying material, to a depth of 80 inches, is fine sand. The upper part is pale brown, and the lower part is white.

The Duckston soils are poorly drained and are in shallow depressions and on flats. Typically, the surface layer is sand about 17 inches thick. The upper part is grayish brown, and the lower part is light brownish gray. The underlying material, to a depth of 80 inches, is sand. It is predominantly light gray, but the lower part is greenish gray.

Beaches are adjacent to the ocean and are covered twice each day by the tide. Typically, beaches are made up of fine sand, sand, coarse sand, and varying amounts of small shell fragments.

The minor soil in this unit is in the Rutlege series. Very poorly drained Rutlege soils are in shallow depressions and drainageways.

This unit is mainly in live oak, brush, and grasses. Some areas have been developed for dwellings and recreation. Potential is poor for most uses because of flooding and wetness. In addition, the soils are too sandy for many recreation and wildlife uses.

Level soils in tidal marshes

This map unit consists of very poorly drained soils in tidal marshes that are flooded frequently by the tide. The soils are predominantly grayish and clayey throughout and contain many grass roots. This unit is mainly along the Cumberland Sound and Satilla River.

8. Bohicket-Capers

Level soils that are clayey throughout, in tidal marshes

This unit consists of very poorly drained soils in tidal marshes (fig. 1). Soils in this unit border the Atlantic Ocean and extend inland several miles along creeks and rivers. This unit contains numerous sounds and tidal streams and is flooded frequently by the tide. Slope is less than 1 percent. Areas of this unit are mainly along the Cumberland Sound and Satilla River and their tributaries.

Figure 1.—Typical vegetation on the Bohicket-Capers general soil map unit. Most of this unit is used for wetland wildlife.

This unit covers about 20 percent of Camden County. Bohicket soils make up about 75 percent of the unit; Capers soils, about 14 percent; and minor soils, about 11 percent.

Bohicket soils border the ocean and are flooded twice each day by the tide. Typically, the surface layer is dark gray silty clay loam about 8 inches thick. The underlying material is dark greenish gray silty clay and clay to a depth of 65 inches or more. There are many fibrous grass roots throughout.

Capers soils extend inland several miles along the creeks and rivers and are flooded frequently by the tide. Typically, the surface layer is very dark gray silty clay about 8 inches thick. The underlying material, to a depth of about 42 inches, is very dark gray and dark gray clay. Below this is greenish gray clay to a depth of 60 inches or more. Fine grass roots are throughout.

The minor soils in this unit are in the Kingsland and Satilla series. These very poorly drained soils formed partly or entirely in organic material and are on flood plains of tidal streams.

This unit, which is mainly in its natural state, is used primarily by wetland wildlife. A few small areas near the Altamaha River are farmed. Soils near the ocean are covered with smooth cordgrass. Soils along the creeks and rivers are mainly in black rush. This unit has good potential as habitat for wetland wildlife. Potential is poor for most other uses. Flooding and wetness are the primary concerns for use and management. Also, the natural sulfur in these soils, which causes an unpleasant odor if exposed to air, further limits the potential of this unit.

Glynn County

There are nine general soil map units in Glynn County. These are further grouped according to slope and landscape.

Level and nearly level soils on flood plains and terraces

These three map units consist of soils on flood plains and terraces adjacent to major streams. Commonly, very poorly drained soils are on flood plains adjacent to poorly drained soils on low terraces. In most places, the soils on flood plains have a grayish loamy surface layer underlain by brownish organic material or a surface layer of dark reddish brown organic material underlain by predominantly brownish organic material. The soils on low terraces are grayish throughout and have a loamy surface layer and a clayey subsoil. These units are mainly along the Altamaha and Little Satilla Rivers and near Buffalo Swamp.

1. Satilla

Level soils that have a loamy surface layer over organic material, on flood plains

This map unit consists of very poorly drained soils on broad flood plains that are influenced by the tide. Slope is less than 1 percent. Areas of this unit are on the flood plain of the Altamaha River.

This unit covers about 2 percent of Glynn County. Satilla soils make up about 95 percent of the unit, and minor soils about 5 percent.

Typically, Satilla soils have a surface layer about 24 inches thick. The upper 5 inches is very dark gray loam. Below that, it is sandy clay loam that is predominantly very dark gray, mottled with dark grayish brown. This is underlain, to a depth of 65 inches or more, by very dark brown organic material that contains many stumps, logs, and roots.

The minor soil in this unit is in the Meggett series. Poorly drained Meggett soils are on broad, low terraces and flood plains.

This unit is used mainly as habitat for wildlife. Much of this unit had been diked and used for farming, but has reverted to giant cutgrass, big cordgrass, and maiden-cane. Thick stands of blackgum, bay, cypress, and other water-tolerant trees grow on the rest. This unit has good potential as habitat for openland and woodland wildlife. Potential is poor as habitat for wetland wildlife. The surface layer is commonly dry during the summer, and wetland areas are difficult to maintain. Potential is fair for woodland production. Equipment limitations and seedling mortality are management problems. This unit has poor potential for farming and urban use. Wetness is the primary concern in managing this unit for most uses.

2. Kingsland

Level soils that are organic throughout, on flood plains

This map unit consists of very poorly drained soils on long, narrow flood plains that are subject to daily flooding by the tide. Slope is less than 1 percent. Areas of this unit are mainly on the flood plain of the Little Satilla River and Buffalo Swamp.

This unit covers about 2 percent of Glynn County. Kingsland soils make up about 82 percent of the unit, and minor soils about 18 percent.

Typically, Kingsland soils have a surface layer of dark reddish brown mucky peat about 10 inches thick. Next, to a depth of 20 inches, is black mucky peat. Below this, to a depth of 65 inches or more, is very dark brown mucky peat.

The minor soils in this unit are in the Brookman and Meggett series. These soils formed in clayey sediment. The very poorly drained Brookman soils are in broad, shallow depressions on marine terraces. Poorly drained Meggett soils are on flood plains and broad, low terraces.

This unit is used mainly as habitat for wildlife. The vegetation is chiefly water-loving hardwoods, such as blackgum, tupelo, cypress, water oak, and ash. This unit has good potential as habitat for wetland wildlife. Potential is poor for most other uses. Flooding and wetness are the primary concerns for use and management.

3. Meggett

Nearly level soils that have a loamy surface layer and a clayey subsoil, on flood plains and terraces

This map unit consists of poorly drained soils on flood plains and broad, low terraces. The soils are saturated or flooded during winter and spring. Slope is less than 1 percent. Areas of this unit are near the Altamaha River.

This unit covers about 2 percent of Glynn County. Meggett soils make up about 95 percent of the unit, and minor soils about 5 percent.

Typically, Meggett soils have a dark gray fine sandy loam surface layer about 5 inches thick. The subsurface layer is gray fine sandy loam mottled with yellowish brown to a depth of 8 inches. The subsoil extends to a depth of 65 inches or more. The upper part of the subsoil is mottled gray and strong brown sandy clay and clay and is greenish gray on the surface of the peds. The middle part is light olive brown clay mottled with yellowish brown. The lower part is gray sandy clay mottled with yellowish brown.

The minor soils in this unit are in the Bohicket, Brookman, Capers, and Satilla series. These soils are very poorly drained. Bohicket and Capers soils are in salt marshes, Brookman soils are in broad shallow depressions, and Satilla soils are on broad flood plains.

This unit is used for woodland and as habitat for wildlife. Water oak, blackgum, and cypress grow on most of the unit, but pines are on some slightly higher areas. This unit has good potential for the locally grown pines and as a habitat for wetland wildlife. Potential is fair for farming in areas not frequently flooded. This unit has poor potential for most other uses. Wetness and flooding are the primary concerns for use and management.

Nearly level or gently sloping soils on ridges and flats and in depressions and drainageways

These two map units consist of soils that are sandy throughout. Commonly, somewhat excessively drained soils that have a grayish surface layer over layers that are brown, gray, white, and yellow are on the slightly higher ridges. Somewhat poorly drained soils that have a grayish surface layer and a thick mottled subsurface layer over a brown or black organic hardpan layer are on lower ridges and flats. Very poorly drained soils that have a black surface layer and mainly grayish underlying layers are in depressions and drainageways. These units are in the east-central and extreme western part of Glynn County and on the coastal islands.

4. Mandarin-Rutlege

Nearly level soils that are sandy throughout, on ridges and flats and in depressions and drainageways

This map unit consists of soils on marine terraces. Somewhat poorly drained soils are on slight ridges and broad flats. Very poorly drained soils are in poorly defined drainageways and shallow depressions. Slope is mainly less than 1 percent. Areas of this unit are in the east-central and extreme western part of Glynn County and on the coastal islands.

This unit covers about 25 percent of the county. Mandarin soils make up about 53 percent of the unit; Rutlege soils, about 26 percent; and minor soils, about 21 percent.

The Mandarin soils are somewhat poorly drained and are on ridges and flats. Typically, these soils are fine sand throughout. The surface layer is very dark gray about 3 inches thick. The subsurface layer is predominantly light gray and extends to a depth of 19 inches. It is underlain by a weakly cemented organic hardpan that extends to a depth of 34 inches. This hardpan is black in the upper part, very dark brown in the middle part, and dark brown in the lower part. Beneath the hardpan, to a depth of 62 inches, are light gray, white, and grayish brown layers. These layers are underlain by a second weakly cemented organic hardpan that is black and extends to a depth of 80 inches or more.

The Rutlege soils are very poorly drained and are in depressions and drainageways. Typically, these soils are fine sand throughout. The surface layer is predominantly black and about 15 inches thick. The underlying material, to a depth of 70 inches or more, is light gray mottled with brownish gray in the upper part, light brownish gray in the middle part, and grayish brown mottled with very dark grayish brown in the lower part.

The minor soils in this unit are Cainhoy, Pelham, and Pottsburg soils and Urban land. Somewhat excessively drained, nearly level and gently sloping Cainhoy soils are on ridges. Poorly drained Pelham soils are on broad flats and in depressions and drainageways. Somewhat poorly drained Pottsburg soils are on low ridges. Urban land is on ridges and broad flats.

This unit is used mainly for woodland. Slash pine and longleaf pine are on the ridges and broad flats. Sand pine, blackgum, bays, and a few cypress are in the depressions and drainageways. The major soils on the higher areas of this unit have fair potential for the locally grown pines; potential is good for loblolly pine and slash pine on the soils in shallow depressions and drainageways. This unit has poor potential for most other uses. Wetness is the primary concern for use and management. Soils in the depressions and drainageways are commonly inundated for brief periods, and flooding is an additional concern.

5. Cainhoy-Mandarin-Pottsburg

Nearly level and gently sloping soils that are sandy throughout, on ridges and flats

This map unit consists of soils on ridges and flat areas of marine terraces. Somewhat poorly drained, nearly level soils are on lower landscapes adjacent to slightly higher, somewhat excessively drained, nearly level or gently sloping soils. Slope is 5 percent or less. This unit is on St. Simons Island and the northern part of Jekyll Island.

This unit covers about 2 percent of Glynn County. Cainhoy soils make up about 46 percent of the unit; Mandarin soils, about 29 percent; Pottsburg soils, about 20 percent; and minor soils, about 5 percent.

The Cainhoy soils are somewhat excessively drained and are nearly level and gently sloping. Typically, the surface layer is dark gray fine sand about 5 inches thick. The underlying layers, to a depth of 120 inches, are fine sand. The upper layer, to a depth of 18 inches, is brownish yellow; below that is a very pale brown layer to a depth of 50 inches. Next are light gray and white layers to a depth of 101 inches. Below these is a dark brown and dark reddish brown layer to a depth of 120 inches.

The Mandarin soils are somewhat poorly drained and are on ridges and flats. Typically, these soils are fine sand throughout. The surface layer is very dark gray about 3 inches thick. The subsurface layer is predominantly light gray and extends to a depth of 19 inches. It is underlain by a weakly cemented organic hardpan that extends to a depth of 34 inches. This hardpan is black in the upper part, very dark brown in the middle part, and dark brown in the lower part. Beneath the hardpan, to a depth of 62 inches, are light gray, white, and grayish brown layers. These layers are underlain by a second weakly cemented organic hardpan that is black and extends to a depth of 80 inches or more.

The Pottsburg soils are somewhat poorly drained and are on low ridges. Typically, these soils are sand throughout. The surface layer is gray about 4 inches thick. The subsurface layer extends to a depth of 63 inches. It is light gray with brownish yellow and brown mottles in the upper part and white with brownish yellow and dark grayish brown mottles in the lower part. This is underlain, to a depth of 80 inches or more, by a weakly cemented dark brown organic hardpan.

The minor soils in this unit are in the Duckston, Fripp, and Rutlege series. Poorly drained Duckston soils are in shallow depressions between dunes and are on flats between dunes and marshes. Excessively drained Fripp soils are on undulating and rolling dunes. Very poorly drained Rutlege soils are in shallow depressions and drainageways.

This unit is used mainly for community development and recreation. Longleaf pine and live oaks are in most areas that have not been cleared for urban purposes. The soils on the lower landscapes have poor potential for urban uses because of wetness. Soils on the higher areas, however, have good potential for most urban uses. The soils in the unit are sandy throughout, and potential is poor for most recreational purposes and most other uses. Wetness on the lower landscapes and low available water capacity on the slightly higher areas are the main concerns for use and management.

Nearly level soils on flats and in depressions and drainageways

These two map units consist of poorly drained soils on flats and poorly and very poorly drained soils in depressions and drainageways. The poorly drained soils are grayish throughout and have a loamy or sandy surface layer and a clayey or loamy subsoil. The very poorly drained soils have a black loamy surface layer and a grayish clayey subsoil. These units are in the west-central and western parts of Glynn County.

6. Bladen-Brookman-Rains

Nearly level soils that have a loamy surface layer and a clayey and loamy subsoil, on flats and in depressions and drainageways

This map unit consists of soils that are subject to flooding or are commonly saturated during winter and spring. Poorly drained soils are commonly on low flats that contain shallow depressions and poorly defined drainageways. Very poorly drained soils are in broad shallow depressions. Slope is mainly 1 percent or less. Areas of this unit are in the western part of Glynn County.

This unit covers about 26 percent of the county. Bladen soils make up about 46 percent of the unit; Brookman soils, about 32 percent; Rains soils, about 10 percent; and minor soils, about 12 percent.

The Bladen soils are poorly drained and are on low flats. Typically, the surface layer is dark gray loam about 5 inches thick. The subsoil is clay and extends to a depth of 65 inches or more. The upper part of the subsoil is gray and has yellowish brown mottles; the lower part is light gray and has dominantly yellowish brown and yellowish red mottles.

The Brookman soils are very poorly drained and are in depressions. Typically, the surface layer is about 15 inches thick. The upper part of the surface layer is black clay loam, and the lower part is very dark gray clay. The subsoil is clay that extends to a depth of 65 inches or more. The upper part of the subsoil is dark gray with brownish yellow mottles, the middle part is grayish brown with brownish yellow and gray mottles, and the lower part is coarsely mottled gray, yellowish brown, and greenish gray.

The Rains soils are poorly drained and are on broad flats and in shallow depressions and drainageways. Typically, the surface layer is very dark gray fine sandy loam about 6 inches thick. The subsurface layer is dark gray sandy loam that extends to a depth of about 18 inches. The subsoil is predominantly gray and extends to a depth of 65 inches or more. The upper part of the subsoil is sandy loam with yellowish brown mottles, the middle part is sandy clay loam with strong brown mottles, and the lower part is sandy clay mottled with yellow, red, and brown.

The minor soils in this unit are the poorly drained Meggett and Pelham soils. Meggett soils are on flood plains and broad low terraces that flood. Pelham soils are on broad flats and in depressions and drainageways.

This unit is used mainly for woodland. Loblolly pine and sweetgum are on the low flats. Blackgum, bays, cypress, water oaks, and sand pine are in the depressions and drainageways. This unit has good potential for the locally grown pines and as habitat for wetland wildlife. Potential is poor for most other uses. Wetness and flooding are the primary concerns for use and management.

7. Pelham-Sapelo

Nearly level soils that have a sandy surface layer over sandy and loamy underlying layers, on flats and in depressions and drainageways

This map unit consists of poorly drained soils on broad flats and in depressions and drainageways. Slope is mainly 1 percent or less. Areas of this unit are in the west-central part of Glynn County.

This unit covers about 12 percent of the county. Pelham soils make up about 50 percent of the unit; Sapelo soils, about 26 percent; and minor soils, about 24 percent.

Pelham soils are on flats and in depressions and drainageways. Typically, the surface layer is very dark gray loamy sand about 7 inches thick. The subsurface layer is grayish brown loamy sand about 18 inches thick. The subsoil is gray and extends to a depth of 75 inches or more. The upper part of the subsoil is mainly sandy clay loam with yellow and red mottles, and the lower part is sandy clay with yellow, red, and gray mottles.

Sapelo soils are on flatwood areas that border depressions and drainageways. Typically, the surface layer is black fine sand about 4 inches thick. The subsurface layer is light gray fine sand that extends to a depth of 17 inches. It is underlain, to a depth of 25 inches, by a weakly cemented fine sand organic hardpan that is predominantly dark brown mottled with dark reddish brown, dark brown, and yellowish brown. Next, to a depth of 49 inches, is a layer of pale yellow fine sand mottled with strong brown and light yellowish brown. Underlying this layer is a subsoil of light gray sandy clay loam mottled with yellowish brown and red to a depth of 84 inches or more.

The minor soils in this unit are in the Albany and Olustee series. Somewhat poorly drained Albany soils are on low ridges. The poorly drained Olustee soils are on convex ridges and are somewhat lower than the better drained Albany soils.

This unit is mainly woodland. Loblolly pine, slash pine, sweetgum, and water oak are dominant on flatwood areas. Sand pine is in the depressions and drainageways. The soils on the flats and low ridges have fair potential for the locally grown pines; potential is good for loblolly pine and slash pine on the soils in depressions and drainageways. This unit has fair potential for habitat for most kinds of wildlife. Potential is poor for most other uses. Wetness is the primary concern for use and management. In addition, flooding is a problem on the soils in depressions and drainageways.

Level to rolling soils on dunes and flats and in depressions, and nearly level beaches

This map unit consists of soils that are sandy throughout. Somewhat excessively drained soils are on undulating and rolling dunes adjacent to poorly drained soils in depressions and on flats. Commonly, sandy ocean beaches lie immediately east of the dunes. The soils on dunes have a brownish surface layer; the underlying material is brown and white. Soils in depressions and on flats are grayish throughout. This unit is on the islands of Jekyll, Sea, and Little St. Simons.

8. Fripp-Duckston-Beaches

Level to rolling soils that are sandy throughout, on dunes and flats and in depressions, and sandy beaches

This map unit consists of excessively drained soils on undulating and rolling dunes and poorly drained soils in shallow depressions between the dunes and on flats between the dunes and marshes (fig. 2). The eastern part of the unit consists of beaches that are covered twice each day by the tide, and the shores are continuously changing in extent and shape. Slope ranges from 0 to 20 percent. This unit is on the islands of Jekyll, Sea, and Little St. Simons.

This unit covers about 1 percent of Glynn County. Fripp soils make up about 55 percent of the unit; Duckston soils, about 21 percent; Beaches, about 19 percent; and minor soils, about 5 percent.

The Fripp soils are excessively drained and are on undulating and rolling dunes. Typically, the surface layer is grayish brown fine sand about 6 inches thick. The underlying material, to a depth of 80 inches, is fine sand; the upper part is pale brown, and the lower part is white.

The Duckston soils are poorly drained and are in shallow depressions and on flats. Typically, the surface layer is sand about 17 inches thick. The upper part is grayish brown, and the lower part is light brownish gray. The underlying material, to a depth of 80 inches, is sand. It is predominantly light gray, but the lower part is greenish gray.

Beaches are adjacent to the ocean and are covered twice each day by the tide. Typically, beaches are made up of fine sand, sand, coarse sand, and varying amounts of small shell fragments.

The minor soil in this unit is in the Rutlege series. Very poorly drained Rutlege soils are in shallow depressions and drainageways.

This unit is mainly in live oak, brush, and grasses. Some areas have been developed for dwellings and recreation. Potential is poor for most uses because of flooding and wetness. In addition, the soils are too sandy for many recreation and wildlife uses.

Level soils in tidal marshes

This map unit consists of very poorly drained soils in tidal marshes that are flooded frequently by the tide. The soils are predominantly grayish and clayey throughout and contain many grass roots. This unit is mainly near the Brunswick, Mackay, and Little Satilla Rivers.

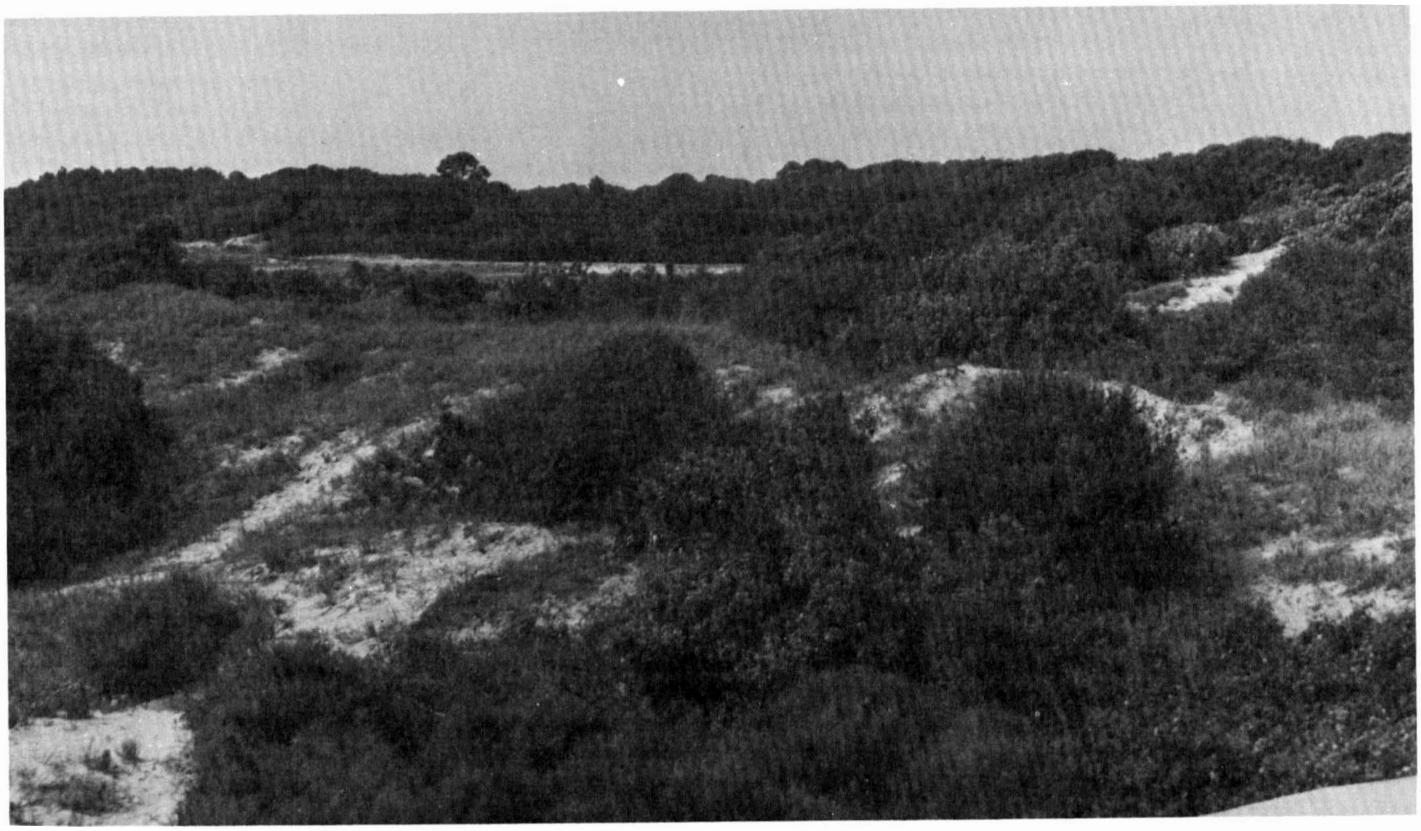


Figure 2.—Fripp-Duckston complex, 0 to 20 percent slopes. The nearness of these soils to the ocean and beaches makes them valuable for recreational uses.

9. Bohicket-Capers

Level soils that are clayey throughout, in tidal marshes

This map unit consists of very poorly drained soils in tidal marshes. Soils in this unit border the Atlantic Ocean and extend inland several miles along creeks and rivers. This unit contains numerous sounds and tidal streams and is flooded frequently by the tide. Slope is less than 1 percent. Areas of this unit are mainly near the Brunswick, Mackay, and Little Satilla Rivers.

This unit covers about 28 percent of Glynn County. Bohicket soils make up about 80 percent of the unit; Capers soils, about 15 percent; and minor soils, about 5 percent.

Bohicket soils border the ocean and are flooded twice each day by the tide. Typically, the surface layer is dark gray silty clay loam about 8 inches thick. The underlying material is dark greenish gray silty clay and clay to a depth of 65 inches or more. There are many fibrous grass roots throughout.

Capers soils extend inland several miles along the creeks and rivers and are flooded frequently by the tide. Typically, the surface layer is very dark gray silty clay about 8 inches thick. The underlying material, to a depth of about 42 inches, is very dark gray and dark gray clay. Below this is greenish gray clay to a depth of 60 inches or more. Fine grass roots are throughout.

The minor soil in this unit is in the Satilla series. These very poorly drained soils formed partly in organic material and are on flood plains of tidal streams.

This unit, which is mainly in its natural state, is used primarily by wetland wildlife. A few small areas near the Altamaha River are farmed. Soils near the ocean are covered by smooth cordgrass. Soils along the creeks and rivers are mainly in black rush. This unit has good potential as habitat for wetland wildlife. Potential is poor for most other uses. Flooding and wetness are the primary concerns for use and management. Also, the natural sulfur in these soils, which causes an unpleasant odor if exposed to air, further limits the potential of this unit.

Broad land use considerations

Deciding which land should be used for urban development is an important issue in the survey area. Each year a considerable amount of land is developed for urban uses in Brunswick, Kingsland, Woodbine, and St. Marys. It is estimated that about 31,000 acres, or nearly one-sixteenth of the survey area, is urban or built-up land.

The general soil map is helpful for general urban planning, but it should not be used for the selection of sites for specific urban structures. In general, the soils that have the best potential for cultivated crops also have the best potential for urban development. The data in this survey about specific soils, however, can be helpful in planning future land use patterns. The following broad land use considerations refer to the survey area as a whole.

Most of the survey area is not well suited to urban development. The Bohicket-Capers, Kingsland, and Satilla units are subject to tidal flooding, and the Meggett unit is subject to stream flooding. The clayey soils in the Bladen-Brookman-Meggett unit and Bladen-Brookman-Rains unit have poor potential for urban development because of wetness and flooding. Most parts of the Pelham-Sapelo unit and Mandarin-Rutlege unit have poor potential for urban development because of wetness.

There are soils in small areas that can be developed for urban uses at lower costs. These include soils in the Cainhoy-Mandarin-Pottsburg unit, Pottsburg-Cainhoy unit, and Fripp-Duckston-Beaches unit. Most of the soils in these units have a water table at a greater depth than is common in the other soils in the survey area.

In some areas there are soils that have better potential for farming than for nonfarm uses. These soils are in general soil map units in which the Bladen, Brookman, Meggett, Pelham, Pottsburg, Rains, and Sapelo soils are dominant. Wetness is the main limitation. In places, installing drainage measures can satisfactorily overcome the wetness problem so that farming is feasible. If proper water management is implemented, vegetables and other specialty crops are suited to soils of the Bladen-Brookman-Meggett, Bladen-Brookman-Rains, Kingsland, Meggett, and Satilla units.

Many of the soils have good or fair potential for woodland. Commercially valuable trees are less common and generally do not grow as rapidly on the wetter soils of the Kingsland, Rutlege, and Satilla units as they do on soils in the other units. Trees do not grow on the soils of the Bohicket-Capers unit because of tidal flooding and high salt content.

The Cainhoy-Mandarin-Pottsburg, Pottsburg-Cainhoy, and Fripp-Duckston-Beaches units have good potential as parks and recreation areas. Hardwood forests enhance the beauty of much of these units. Marshes and swamps of the Bohicket-Capers, Kingsland, and Satilla units are good for nature study areas. All of these units provide excellent habitat for many important species of wildlife.

Soil maps for detailed planning

The map units shown on the detailed soil maps at the back of this publication represent the kinds of soil in the survey area. They are described in this section. The descriptions together with the soil maps can be useful in determining the potential of a soil and in managing it for food and fiber production; in planning land use and developing soil resources; and in enhancing, protecting, and preserving the environment. More information for each map unit, or soil, is given in the section "Use and management of the soils."

Preceding the name of each map unit is the symbol that identifies the soil on the detailed soil maps. Each soil description includes general facts about the soil and a brief description of the soil profile. In each description, the principal hazards and limitations are indicated, and the management concerns and practices needed are discussed.

Each map unit on the detailed soil maps represents an area on the landscape made up mostly of the soil or soils for which the unit is named. Most of the delineations shown on the detailed soil map are phases of soil series.

Soils that have profiles that are almost alike make up a *soil series*. Except for allowable differences in texture of the surface layer or of the underlying substratum, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement in the profile. A soil series commonly is named for a town or geographic feature near the place where a soil of that series was first observed and mapped.

Soils of one series can differ in texture of the surface layer or in the underlying substratum and in slope, erosion, stoniness, salinity, wetness, or other characteristics that affect their use. On the basis of such differences, a soil series is divided into phases. The name of a *soil phase* commonly indicates a feature that affects use or management. For example, Meggett loam, frequently flooded, is one of several phases within the Meggett series.

Some map units are made up of two or more dominant kinds of soil. Such map units are called soil complexes, soil associations, and undifferentiated groups.

A *soil complex* consists of areas of two or more soils that are so intricately mixed or so small in size that they cannot be shown separately on the soil map. Each area includes some of each of the two or more dominant soils, and the patterns and proportions are somewhat similar in all areas. Fripp-Duckston complex, 0 to 20 percent slopes, is an example.

A *soil association* is made up of soils that are geographically associated and are shown as one unit on the map because it is not practical to separate them. A soil association has considerable regularity in geographic pattern and in the kinds of soil that are a part of it. The extent of the soils can differ appreciably from one delineation to another; nevertheless, interpretations can be made for use and management of the soils. Bohicket-Capers association is an example.

Most map units include small, scattered areas of soils other than those that appear in the name of the map unit. Some of these soils have properties that differ substantially from those of the dominant soil or soils and thus could significantly affect use and management of the map unit. These soils are described in the description of each map unit. Some of the more unusual or strongly contrasting soils that are included are identified by a special symbol on the soil map.

Most mapped areas include places that have little or no soil material and support little or no vegetation. Such places are called *miscellaneous areas*; they are delineated on the soil map and given descriptive names. Beaches is an example. Some of these areas are too small to be delineated and are identified by a special symbol on the soil map.

The acreage and proportionate extent of each map unit are given in table 4, and additional information on properties, limitations, capabilities, and potentials for many soil uses is given for each kind of soil in other tables in this survey. (See "Summary of tables.") Many of the terms used in describing soils are defined in the Glossary.

AdA—Albany fine sand, 0 to 2 percent slopes. This deep, somewhat poorly drained, nearly level soil is on low ridges of the Atlantic Coast Flatwoods. Individual areas are 10 to 150 acres.

Typically, the surface layer is dark grayish brown fine sand 8 inches thick. The subsurface layer is fine sand 40 inches thick; it is very pale brown mottled with gray and brown. The subsoil, to a depth of 80 inches, is sandy clay loam. The upper part of the subsoil is brownish yellow mottled with light gray and strong brown, and the lower part is mottled light gray, brownish yellow, and red.

This soil is low in natural fertility and organic matter content. Reaction ranges from very strongly acid to medium acid throughout except in the surface layer of limed areas. Permeability is rapid in the surface layer and thick subsurface layer and moderate in the subsoil. Available water capacity is low. This soil has good tilth and can be worked throughout a wide range of moisture conditions. The root zone is deep, but the water table, which is commonly 12 to 30 inches below the surface during winter and spring, limits root penetration.

Included in mapping are a few areas in which the subsoil is 60 inches or more below the surface. A few areas are included in which the upper part of the subsoil is between 20 and 40 inches below the surface. Also included are a few intermingled areas of Olustee, Pelham, and Pottsburg soils. These included areas make up about 5 to 10 percent of this map unit, but separate areas generally are smaller than 1 acre.

This soil has fair potential for row crops, small grains, hay, and pasture. Its potential is limited because of wetness and low available water capacity.

Potential is fair for loblolly pine and slash pine. The major management problem is wetness, which causes equipment limitations and seedling mortality. Bedding in conjunction with open ditches can help overcome this problem.

This soil has poor potential for most urban uses. Wetness is the major limitation. Some places can be satisfactorily drained if the drainage system is properly designed and carefully installed.

Potential is poor for wetland wildlife. The soil is somewhat poorly drained, and wetland areas cannot be created easily.

The capability subclass is IIIw; woodland suitability group is 3w.

Be—Beaches. This map unit consists of beaches on the ocean side of the islands of Little St. Simons, St. Simons, Jekyll, and Cumberland. Sand dunes commonly are west of the beaches. The beaches are made up of fine sand, sand, coarse sand, and varying amounts of small shell fragments.

Beaches are covered twice each day by ocean tides, and the sandy shores are constantly washed and rewashed by waves. Since the prevailing currents move southward parallel to the beaches, the areas are continuously changing in extent and shape. Because of the current and the action of breakers, the northern end of each island is eroding and the southern end is increasing in size as the sand is shifted by wind and water.

Bk—Bladen loam. This deep, poorly drained, nearly level soil is on broad, low flats and in small isolated depressions of the Atlantic Coast Flatwoods. It is commonly flooded for long periods during winter and early spring. Individual areas are 15 to 75 acres.

Typically, the surface layer is dark gray loam about 5 inches thick. The subsoil is clay that extends to a depth of 65 inches or more. The upper part of the subsoil is gray and has yellowish brown mottles, and the lower part is light gray and has dominantly yellowish brown and yellowish red mottles.

This soil is low in natural fertility and organic matter content. Reaction ranges from strongly acid to extremely acid throughout except in the surface layer of limed areas. Permeability is slow, and available water capacity is medium. This soil has fair tilth and can be worked more easily during the drier seasons. Although the root zone is deep, the water table is commonly less than 12 inches below the surface during winter and spring and limits depth of root penetration.

Included in mapping are a few intermingled areas of Brookman, Meggett, and Rains soils. These included areas make up about 10 to 15 percent of this map unit, but separate areas are generally smaller than 1 acre.

This soil has poor potential for farming because of wetness and flooding. Commonly, open ditches can help overcome these limitations. Although rice is not commonly grown in the survey area, this soil has good potential for rice culture if a good water management system is installed.

Potential is good for loblolly pine, slash pine, and American sycamore. The major management problems are wetness and flooding, which cause equipment limitations and seedling mortality. Bedding in conjunction with open ditches can help overcome the wetness problem.

This soil has poor potential for most urban uses. Wetness and flooding are limitations that can be overcome only by major flood control and drainage measures. In addition, the slow permeability of the subsoil is a limitation for septic tank absorption fields. This can be overcome by placing the filter field in a mound of suitable material and installing subsurface drains.

Potential is good for wetland wildlife. Wetland areas can easily be created for habitat for wetland wildlife.

The capability subclass is Vw; woodland suitability group is 2w.

BO—Bohicket-Capers association. This map unit consists of very poorly drained soils in a regular and repeating pattern. The landscape consists of level tidal marshes that border the Atlantic Ocean and extend a few miles inland along creeks and rivers. Bohicket soils are in broad marshes that border the Atlantic Ocean. Capers soils are in narrow marshes that interfinger the mainland and in narrow floodways of inland creeks and rivers. These soils formed in silty and clayey marine sediment. Mapped areas commonly are 1,000 acres or more. The composition of this unit is more variable than that of the other map units in this survey, but has been controlled well enough for interpretations to be made for the expected uses.

Bohicket soils make up 80 percent of the unit. Typically, the surface layer is dark gray silty clay loam about 8 inches thick. The substratum is dark greenish gray silty clay and clay to a depth of 65 inches or more. There are many fibrous grass roots throughout.

Bohicket soils have very slow permeability. Available water capacity is very low. Reaction ranges from slightly acid to moderately alkaline. The sulfur content is 2 or 3 percent, and a strong hydrogen sulfide odor is noticeable if the soil is disturbed. Bohicket soils are flooded by sea water twice each day.

Capers soils make up about 15 percent of the unit. Typically, the surface layer is very dark gray silty clay about 8 inches thick. The substratum, to a depth of about 42 inches, is very dark gray and dark gray clay. Below this is greenish gray clay to a depth of 60 inches or more. There are fine grass roots throughout.

Capers soils have very slow permeability and very low available water capacity. Reaction is neutral or mildly alkaline throughout. Capers soils are flooded by spring tides and, in some places, daily tides.

Included in mapping are a few small areas of Mandarin soils. Also included are spoil areas from dredging and small areas that are sandy and more firm than the Bohicket and Capers soils.

Most of this map unit has good potential for, and is used as, wetland wildlife habitat. A few scattered areas near the edge of the unit are in pasture. Potential is poor for most other uses. Tidal flooding and salinity prevent establishment of trees. Frequent flooding is the main limitation and it is extremely difficult to overcome. In addition, very slow permeability, low strength, and high shrink-swell potential are limitations for community development.

The capability subclass is VIIIw.

Br—Brookman clay loam. This deep, very poorly drained, nearly level soil is in broad, shallow depressions of the Atlantic Coast Flatwoods. It is commonly flooded for long periods from fall until spring. Individual areas are 10 to 75 acres.

Typically, the surface layer is about 15 inches thick. The upper part of the surface layer is black clay loam, and the lower part is very dark gray clay. The subsoil is clay that extends to a depth of 65 inches or more. The upper part of the subsoil is dark gray with brownish yellow mottles, the middle part is grayish brown with brownish yellow and gray mottles, and the lower part is coarsely mottled gray, yellowish brown, and greenish gray.

This soil is medium in natural fertility and organic matter content. Reaction ranges from strongly acid to slightly acid in the surface layer and upper subsoil. The lower subsoil ranges from strongly acid to mildly alkaline. Permeability is slow, and available water capacity is medium. This soil has poor tilth and can be worked more easily during the drier seasons. Although the root zone is deep, the water table is commonly less than 12 inches below the surface from fall until late spring and limits depth of root penetration.

Included in mapping are a few areas of a similar soil that is very strongly acid throughout. Also included are a few intermingled areas of Bladen, Meggett, and Rains soils. These included soils make up about 15 percent of this map unit.

Potential is poor for farming because of wetness and flooding. Bedding in conjunction with open ditches will help overcome these limitations. Although rice is not commonly grown in the survey area, this soil has good potential for rice culture if a good water management system is installed.

Potential is good for loblolly pine, slash pine, and American sycamore. The major management concern is wetness, which causes equipment limitations and seedling mortality. Ponding of floodwater and poor outlets contribute to the wetness. This problem can be overcome by using special equipment and by logging during the drier seasons. Commonly, bedding in conjunction with open ditches can help reduce the high seedling mortality rate.

This soil has poor potential for most urban uses. Wetness and ponding of floodwater are limitations that can be overcome only by major drainage measures. In addition, slow permeability is a limitation for septic tank absorption fields. Low strength is a limitation for many urban uses.

Potential is good for wetland wildlife. Areas of habitat for wetland wildlife can be easily created.

The capability subclass is VIw; woodland suitability group is 2w.

CaB—Cainhoy fine sand, 0 to 5 percent slopes. This deep, somewhat excessively drained, nearly level and gently sloping soil is on ridges of the Atlantic Coast Flatwoods. Individual areas are 10 to 100 acres.

Typically, the surface layer is dark gray fine sand about 5 inches thick. The underlying layers, to a depth of 120 inches, are fine sand. The upper layer, to a depth of 18 inches, is brownish yellow; below that is a very pale brown layer to a depth of 50 inches. Next are light gray and white layers to a depth of 101 inches. Below these is a black and dark reddish brown layer to a depth of 120 inches.

This soil is low in natural fertility and organic matter content. Reaction ranges from very strongly acid to slightly acid except in the surface layer of limed areas. Permeability is rapid, and available water capacity is low. This soil has good tilth and can be worked throughout a wide range of moisture conditions. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few intermingled areas of Mandarin and Pottsburg soils. These included soils make up about 5 to 10 percent of this map unit, but areas generally are smaller than 1 acre.

This soil has poor potential for row crops, small grains, hay, and pasture. Its potential is limited mainly by low available water capacity. Crop residue returned to the soil can help overcome this limitation to some extent.

This soil has poor potential for slash pine, loblolly pine, and longleaf pine. Equipment limitations and seedling mortality are management problems.

Potential is good for most urban uses. The soil is too sandy, however, for most recreational uses, and seepage is a limitation for most sanitary facilities.

The potential is very poor for wetland wildlife. The soil is somewhat excessively drained, and wetland areas cannot be easily created.

The capability subclass is IVs; woodland suitability group is 3s.

FdD—Fripp-Duckston complex, 0 to 20 percent slopes. This map unit consists of small areas of Fripp and Duckston soils that are so intermingled that they could not be separated at the scale selected for mapping. Fripp soils are on undulating and rolling dunes; Duckston soils are generally in shallow depressions between the dunes and on flats between the dunes and marshes. Some areas of gently sloping Duckston soils are on the lower parts of the dunes. The Duckston soils are frequently flooded for long to very long periods throughout the year. Mapped areas are 25 to 100 acres.

Fripp fine sand makes up about 70 percent of each mapped area. Typically, the surface layer is grayish brown fine sand about 6 inches thick. The underlying material, to a depth of 80 inches, is fine sand. The upper part is pale brown, and the lower part is white.

This Fripp soil is very low in natural fertility and organic matter content. Reaction ranges from medium acid to mildly alkaline throughout. Permeability is rapid, and available water capacity is very low.

Duckston sand makes up about 30 percent of each mapped area. Typically, the surface layer is sand about 17 inches thick. The upper part is grayish brown, and the lower part is light brownish gray. The underlying material, to a depth of 80 inches, is sand. It is predominantly light gray, but the lower part is greenish gray.

This Duckston soil is very low in natural fertility and organic matter content. Reaction ranges from medium acid to mildly alkaline throughout. Permeability is very rapid, and available water capacity is very low.

Most of this unit is in live oak, brush, and grasses. Potential is poor for most uses.

Fripp soils are subject to seepage if used for community development and are too sandy for many recreational uses. The lower Duckston soils are commonly wet throughout the year and are subject to frequent flooding. Because the soils in this unit are sandy throughout and predominantly excessively drained, wetland areas for wildlife cannot be easily created.

The capability subclass is VIIs; woodland suitability group is 4s.

Kk—Kingsland mucky peat. This deep, very poorly drained, level and depressional organic soil is on flood plains of the Atlantic Coast Flatwoods. It is subject to daily flooding by the tide. Individual areas are 100 to 300 acres.

Typically, the surface layer is dark reddish brown mucky peat about 10 inches thick. Below this, to a depth of 20 inches, is black mucky peat. This is underlain, to a depth of 65 inches or more, by very dark brown mucky peat.

This soil is high in natural fertility and organic matter content. Reaction ranges from very strongly acid to slightly acid throughout. Permeability is rapid, and available water capacity is high. The root zone is deep, but penetration by plant roots depends on the depth to the water table during the growing season.

Included in mapping are intermingled areas of Brookman and Meggett soils. These included soils make up about 5 to 10 percent of this map unit, but areas are generally smaller than 1 acre.

This soil has good potential for wetland wildlife. Potential is poor for most other uses. Flooding is the main limitation and it is extremely difficult to overcome. In addition, year-round wetness, subsidence, and the high content of organic matter are limitations for urban and recreational development.

The capability subclass is VIIw; woodland suitability group is 4w.

Ma—Mandarin fine sand. This deep, somewhat poorly drained, nearly level soil is on slight ridges and broad flats in the Atlantic Coast Flatwoods. Individual areas are 10 to 100 acres.

Typically, the soil is fine sand throughout. The surface layer is very dark gray about 3 inches thick. The subsurface layer is predominantly light gray and extends to a depth of 19 inches. It is underlain by a weakly cemented organic hardpan that extends to a depth of 34 inches; this hardpan is black in the upper part, very dark brown in the middle part, and dark brown in the lower part. Beneath the hardpan, to a depth of 62 inches, are light gray, white, and grayish brown layers. These layers are underlain by a second weakly cemented organic hardpan that is black and extends to a depth of 80 inches or more.

This soil is low in natural fertility and organic matter content. Reaction ranges from extremely acid to medium acid in the surface layer, subsurface layer, and first organic hardpan; below this it is medium acid to neutral. Permeability is rapid except in the organic hardpan layers, where it is moderate. Available water capacity is low. Tilth is good, but the soil can be worked more easily during the drier seasons. The hardpan restricts root penetration. In addition, the water table is commonly at depths of 18 to 40 inches during summer and fall.

Included in mapping are a few small areas of Cainhoy, Pottsburg, and Rutlege soils.

This soil has poor potential for row crops and small grains because of low available water capacity. Potential is fair for hay and pasture.

The potential is fair for loblolly pine and slash pine. Low available water capacity is the main limitation to obtaining good woodland production.

Mandarin soils have poor potential for most urban uses because of wetness. If the soil is altered by drainage systems, fill material, or other suitable modifications, however, the potential will be increased.

Potential is very poor for wetland wildlife. Because the soil is sandy throughout and somewhat poorly drained, wetland areas for wildlife cannot be easily created.

The capability subclass is VIs; woodland suitability group is 4s.

Mb—Mandarin-Urban land complex. This complex consists of somewhat poorly drained Mandarin soils and Urban land so intermingled that they could not be mapped separately at the scale selected. It is on nearly level ridges and broad flats in the Atlantic Coast Flatwoods. Areas are mostly 50 to 500 acres.

Mandarin fine sand makes up about 55 percent of each mapped area. Typically, the soil is fine sand throughout. The surface layer is very dark gray about 3 inches thick. The subsurface layer is predominantly light gray and extends to a depth of 19 inches. It is underlain by a weakly cemented organic hardpan that extends to a depth of 34 inches; this hardpan is black in the upper part, very dark brown in the middle part, and dark brown in the lower part. Beneath the hardpan, to a depth of 62 inches, are light gray, white, and grayish brown layers. These layers are underlain by a second weakly cemented organic hardpan that is black and extends to a depth of 80 inches or more.

This Mandarin soil is low in natural fertility and organic matter content. Reaction ranges from extremely acid to medium acid in the surface layer, subsurface layer, and first organic hardpan; below this it is medium acid to neutral. Permeability is rapid except in the organic hardpan layers, where it is moderate. Available water capacity is low. Tilth is good, but the soil can be worked more easily during the drier seasons. The weakly cemented hardpan restricts root penetration. In addition, the water table is commonly at depths of 18 to 40 inches during summer and spring.

Urban land makes up about 45 percent of each mapped area. Most areas are used for private dwellings, industries, parking lots, streets, shopping centers, commercial buildings, schools, and churches (fig. 3). The soils have been altered by grading, cutting, filling, shaping, and smoothing.

This complex is used primarily for nonfarm purposes, including gardens, shrubs, shade trees, and lawns. Although wetness is a limitation, this complex can commonly be altered by draining, filling, or employing other suitable measures. Because this complex has a seasonal high water table, water-tolerant plants are best suited to landscaping and vegetable gardens.

The capability subclass is VIs.

Me—Meggett fine sandy loam. This deep, poorly drained, nearly level soil is on broad, low terraces of the Atlantic Coast Flatwoods. Individual areas are 20 to 200 acres.

Typically, the surface layer is dark gray fine sandy loam about 5 inches thick. The subsurface layer, about 3 inches thick, is gray fine sandy loam mottled with yellowish brown. The subsoil extends to a depth of 65 inches or more. The upper part of the subsoil is mottled gray and strong brown sandy clay and clay and is greenish gray on the surface of the peds. The middle part is light olive brown clay mottled with yellowish brown. The lower part is gray sandy clay mottled with yellowish brown.

This soil is high in natural fertility and low in organic matter content. Reaction is slightly acid or medium acid

Figure 3.—Mandarin-Urban land complex. Urban areas are not extensive in Camden and Glynn Counties.

in the surface layer and ranges from slightly acid to moderately alkaline in the subsoil. Permeability is slow, and available water capacity is medium. Tilth is fair. Although the root zone is deep, the water table is less than 12 inches below the surface from fall until spring and limits the depth of root penetration.

Included in mapping are soils that are loamy sand, sand, clay loam, or sandy loam below a depth of 50 inches. Also included are a few intermingled areas of Bladen, Brookman, and Rains soils. These included soils make up about 5 to 10 percent of this map unit, but areas are generally smaller than 1 acre.

This soil has fair potential for row crops, small grains, hay, and pasture. Its potential is limited mainly by wetness. Commonly, open ditches can help overcome this limitation. Although rice is not commonly grown in the survey area, this soil has good potential for rice culture if a good water management system is installed.

Potential is good for loblolly pine and slash pine. The major management problem is wetness, which causes equipment limitations and seedling mortality. This problem can be overcome to some extent by using special equipment and logging during the drier seasons. Bedding in conjunction with surface ditches can reduce the high seedling mortality rate.

This soil has poor potential for most urban uses. Commonly, wetness can be overcome by installing drainage systems. The slow permeability of the subsoil is a limitation for septic tank absorption filter fields, but this can be overcome by placing the filter field in a mound of suitable material and installing subsurface drains.

Potential is good for wetland wildlife. Wetland areas can be easily created for habitat for wetland wildlife.

The capability subclass is IIIw; woodland suitability group is 1w.

Mf—Meggett loam, frequently flooded. This deep, poorly drained, nearly level soil is on the flood plain of the Altamaha River. It is frequently flooded for brief periods during winter and early spring.

Typically, the surface layer is very dark gray loam about 3 inches thick. The subsurface layer is gray loam to a depth of 10 inches. The subsoil, to a depth of 65 inches, is mainly gray and has yellowish brown mottles. The upper part of the subsoil is sandy clay, the middle part is clay, and the lower part is sandy clay.

This soil has high natural fertility and medium organic matter content. Reaction is slightly acid or medium acid in the surface layer and ranges from slightly acid to moderately alkaline in the subsoil. Permeability is slow, and available water capacity is medium. Tilth is fair. The root zone is deep, but the water table is less than 12 inches below the surface from fall until spring and limits the depth of root penetration.

Included in mapping are a few intermingled areas of Brookman soils. These included soils make up about 5 to 10 percent of this map unit, but areas are generally smaller than 1 acre.

This soil is wooded. It has good potential for loblolly pine, slash pine, and sweetgum. The major management problems are wetness and flooding, which cause equipment limitations and seedling mortality. These limitations can be overcome by using special equipment and logging during the drier seasons.

The potential is poor for farming and urban use. Wetness and flooding are the main limitations and can be overcome only by major flood control and drainage measures.

Potential is good for wetland wildlife. Areas of habitat for wetland wildlife can be easily created.

The capability subclass is VIw; woodland suitability group is 1w.

Om—Olustee sand. This deep, poorly drained, nearly level soil is on convex ridges that border depressions and drainageways of the Atlantic Coast Flatwoods. Individual areas are 10 to 100 acres.

Typically, the surface layer is black sand about 5 inches thick. It is underlain by a weakly cemented organic sand hardpan that extends to a depth of 19 inches; this hardpan is very dark grayish brown in the upper part and dark grayish brown in the lower part. Below the hardpan, to a depth of 35 inches, is predominantly light brownish gray sand that has yellow and brown mottles. Under this layer, to a depth of 80 inches or more, is a subsoil of light gray sandy clay loam mottled with yellowish brown and gray.

This soil is low in natural fertility and organic matter content. Reaction is very strongly acid or strongly acid except in the surface layer of limed areas. Permeability is moderate in the organic hardpan and in the underlying subsoil. Available water capacity is medium. Tilth is good. Although the root zone is deep, this soil is commonly saturated during the growing season, and the growth of plants is limited.

Included in mapping are a few areas of soils that have sandy layers that extend more than 40 inches below the surface. Also included are a few intermingled areas of Albany, Pelham, and Sapelo soils. These included soils make up about 5 to 10 percent of this map unit, but areas are generally smaller than 1 acre.

This soil has poor potential for row crops and small grains because of wetness. It has fair potential for hay and pasture.

The potential is fair for loblolly pine and slash pine. The major management problem is wetness, which causes equipment limitations and seedling mortality. Using special equipment and logging during the drier seasons can help overcome this problem. Also, bedding can be used in places to help reduce the seedling mortality rate.

This soil has poor potential for most urban uses. Wetness is the major limitation, but this limitation can be overcome if the soil is adequately drained.

Potential is poor for wetland wildlife. Because the soil has a sandy surface layer, wetland areas for wildlife cannot be created easily.

The capability subclass is IIIw; woodland suitability group is 3w.

Pe—Pelham loamy sand. This deep, poorly drained, nearly level soil is on broad flats and in depressions and drainageways of the Atlantic Coast Flatwoods. It is commonly flooded for brief periods during the winter. Individual areas are 10 to 200 acres.

Typically, the surface layer is very dark gray loamy sand about 7 inches thick. The subsurface layer is grayish brown loamy sand that extends to a depth of 25 inches. The subsoil is gray and extends to a depth of 75 inches or more. The upper part of the subsoil is mainly sandy clay loam with yellow and red mottles, and the lower part is sandy clay with yellow, red, and gray mottles.

This soil is low in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid except in the surface layer of limed areas. Permeability is moderate, and available water capacity is medium. Tilth is fair. This soil can be worked most easily during the drier seasons. Although the root zone is deep, the water table is commonly at a depth of 6 to 18 inches during the winter and spring and limits the depth of root penetration.

Included in mapping are a few areas that have sandy layers to a depth of more than 40 inches and a few areas in which the subsoil is entirely sandy clay. Also included are a few intermingled areas of Albany, Olustee, Rains, and Sapelo soils. These included soils make up about 5 to 10 percent of this map unit, but areas generally are smaller than 1 acre.

This soil has poor potential for farming because of wetness and flooding. In places, open ditches can help overcome these limitations.

Potential is good for loblolly pine and slash pine. The major management problems are wetness and flooding, which cause equipment limitations and seedling mortality. Bedding in conjunction with open ditches can help overcome the wetness problem.

This soil has poor potential for most urban uses. Wetness and flooding are major management problems that are difficult to overcome.

Potential is fair for wetland wildlife. Because the soil has a thick sandy surface layer, wetland areas for wildlife cannot be easily created.

The capability subclass is Vw; woodland suitability group is 2w.

Po—Pottsburg sand. This deep, somewhat poorly drained, nearly level soil is on low ridges of the Atlantic Coast Flatwoods. Individual areas are 15 to 75 acres.

Typically, the soil is sand throughout. The surface layer is gray and about 4 inches thick. The subsurface layer extends to a depth of 63 inches; it is light gray with brownish yellow and brown mottles in the upper part and white with brownish yellow and dark grayish brown mottles in the lower part. This is underlain by a very weakly cemented, dark brown organic hardpan to a depth of 80 inches or more.

This soil is very low in natural fertility and organic matter content. Reaction ranges from very strongly acid to slightly acid in the surface layer and very strongly acid to medium in the hardpan. Permeability is rapid in the thick sandy layers and moderate in the organic hardpan. The available water capacity is low. This soil has good tilth and can be worked throughout a wide range of moisture conditions. The root zone is deep and easily penetrated by plant roots. The water table is commonly at a depth of 12 to 40 inches during summer to winter.

Included in mapping are a few intermingled areas of Cainhoy and Mandarin soils. These included soils make up about 5 to 10 percent of this map unit, but areas generally are smaller than 1 acre.

This soil has poor potential for row crops and small grains because of wetness and low available water capacity. It has fair potential for hay and pasture (fig. 4).

This soil has fair potential for loblolly pine and slash pine. Wetness is the main limitation to equipment use in managing and harvesting the tree crop, but this can be overcome by using special equipment and logging during the drier seasons. In addition, drainage is needed to reduce the seedling mortality rate.

Potential is poor for most urban uses because of wetness. If the soil is altered by drainage systems, fill material, or other suitable modifications, however, the potential will be increased.

Potential is very poor for wetland wildlife. Because the soil is sandy throughout and somewhat poorly drained, wetland areas for wildlife cannot be easily created.

The capability subclass is IVw; woodland suitability group is 3w.

Ra—Rains fine sandy loam. This deep, poorly drained, nearly level soil is on broad flats and in shallow depressions and drainageways of the Atlantic Coast Flatwoods. Individual areas are 10 to 50 acres.

Typically, the surface layer is very dark gray fine sandy loam about 6 inches thick. The subsurface layer is dark gray sandy loam that extends to a depth of about 18 inches. The subsoil extends to a depth of 65 inches or more. The upper part of the subsoil is gray sandy loam with yellowish brown mottles. The middle part is gray sandy clay loam with strong brown mottles. The lower

Figure 4.—Bahiagrass on Pottsburg sand. Potential is fair for hay and pasture on this soil.

part is grayish brown sandy clay mottled with yellow, red, and brown.

This soil is low in natural fertility and organic matter content. It is very strongly acid or strongly acid throughout except where the surface layer has been limed. Permeability is moderate, and available water capacity is medium. Tilth is fair. Although the root zone is deep, this soil is commonly saturated from fall to early spring, and the growth of plants is limited.

Included in mapping are small intermingled areas of Bladen and Pelham soils. Also included on the upper flood plain of the Satilla River in Camden County are areas of Rains soils that flood each year for 2 to 4 days. These included soils make up about 10 to 20 percent of this map unit, but areas generally are smaller than 3 acres.

This soil has poor potential for farming because of wetness. If this soil is used for farming, open ditches can help overcome the wetness problem.

Potential is good for loblolly pine, slash pine, American sycamore, and sweetgum. The potential is limited by wetness, but this limitation can be overcome if surface drainage systems are installed. Using special equipment and logging during the drier seasons can also help.

This soil has poor potential for urban uses. Wetness is the primary limitation. It can commonly be overcome by drainage measures.

Potential is good for wetland wildlife. Areas of habitat for wetland wildlife can be easily created.

The capability subclass is IVw; woodland suitability group is 2w.

Ru—Rutlege fine sand. This deep, very poorly drained, nearly level soil is in shallow depressions and drainageways of the Atlantic Coast Flatwoods. It is commonly flooded for brief periods during winter and spring. Individual areas are 10 to 100 acres.

Typically, the soil is fine sand throughout. The surface layer is predominantly black and about 15 inches thick. The underlying material, to a depth of 70 inches or more, is light gray mottled with brownish gray in the upper part, light brownish gray in the middle part, and grayish brown mottled with very dark grayish brown in the lower part.

This soil has high organic matter content in the surface layer. It is low in natural fertility. Reaction is extremely acid or very strongly acid throughout. Permeability is rapid, and available water capacity is low. Tilth is fair. Although the root zone is deep, this soil is commonly saturated during winter and spring, and the growth of plants is limited.

Included in mapping are soils that have a sand surface layer. Also included are a few intermingled areas of Mandarin and Pelham soils. These included soils make up 5 to 10 percent of this map unit, but individual areas generally are smaller than 1 acre.

This soil has poor potential for farming because of wetness. Difficulty in locating outlets for drainage systems and low available water capacity are also limitations. Although rice is not commonly grown in the survey area, this soil has good potential for rice culture if a good water management system is installed.

Potential is good for loblolly pine, slash pine, American sycamore, and sweetgum. The potential is limited by wetness, but this limitation can be overcome if surface drainage systems are installed. Using special equipment and logging during the drier seasons can also help.

This soil has poor potential for urban uses. Wetness and ponding of floodwater are limitations that can be overcome only by major drainage measures or other suitable soil modifications.

Potential is fair for wetland wildlife. Because the soil is sandy throughout, wetland areas for wildlife cannot be created easily.

The capability subclass is VIw; woodland suitability group is 2w.

Sa—Sapelo fine sand. This deep, poorly drained, nearly level soil is on flatwood areas that border depressions, drainageways, and bays of the Atlantic Coast Flatwoods. Individual areas are 10 to 100 acres.

Typically, the surface layer is black fine sand about 4 inches thick. The subsurface layer is light gray fine sand that extends to a depth of 17 inches. This is underlain, to a depth of 25 inches, by a weakly cemented fine sand organic hardpan that is predominantly dark brown mottled with dark reddish brown, dark brown, and yellowish brown. Next, to a depth of 49 inches, is a layer of pale yellow fine sand mottled with strong brown and light yellowish brown. Under this, to a depth of 84 inches or more, is a subsoil of light gray sandy clay loam mottled with yellowish brown and red.

This soil is low in natural fertility and organic matter content. Reaction ranges from extremely acid to strongly acid except in the surface layer of limed areas. Permeability is moderate, and available water capacity is low. This soil has good tilth. It can be worked most easily in the drier seasons. The weakly cemented hardpan restricts root penetration. The water table, which is commonly at a depth of 18 to 30 inches during winter and spring, also limits the depth of root penetration.

Included in mapping are a few areas of soil in which sandy clay loam is at a depth of less than 40 inches. Also included are a few intermingled areas of Albany, Olustee, and Pelham soils. These included soils make up about 5 to 10 percent of this map unit, but areas are generally smaller than 1 acre.

This soil has poor potential for row crops and small grains, mainly because of wetness. It has fair potential for hay and pasture.

The potential is fair for loblolly pine and slash pine. The major management problem is wetness, which causes equipment limitations and seedling mortality. Using special equipment and logging during the drier seasons can help overcome the wetness problem. Also, bedding can be used in places to help reduce the seedling mortality rate.

This soil has poor potential for most urban uses. Wetness is the major limitation, but this limitation can be overcome if the soil is adequately drained.

Potential is fair for wetland wildlife. Because the soil has a sandy surface layer, wetland areas for wildlife cannot be easily created.

The capability subclass is IVw; woodland suitability group is 3w.

Sb—Satilla loam. This deep, very poorly drained, level soil is on broad flood plains of the Atlantic Coast Flatwoods. It is frequently flooded for long periods during the winter and spring. Individual areas are 50 to 200 acres.

Typically, the surface layer is about 24 inches thick. The upper 5 inches is very dark gray loam. Below that it is sandy clay loam that is predominantly very dark gray mottled with dark grayish brown. This is underlain by very dark brown organic material that contains many stumps, logs, and roots to a depth of 65 inches or more.

This soil is high in natural fertility and organic matter content. Reaction is strongly acid or very strongly acid except in the surface layer of limed areas. Permeability is moderately rapid, and available water capacity is medium. Tilth is fair. The root zone is deep, but penetration by plant roots depends on the depth to the water table during the growing season.

Included in mapping are a few intermingled areas of Kingsland and Meggett soils. These included soils make up about 5 to 10 percent of this map unit, but individual areas are smaller than 1 acre.

This soil has poor potential for farming because of wetness. If drainage systems are regulated and dikes are installed, the potential is good for farm crops and truck crops. Although rice is not commonly grown in the survey area, this soil has good potential for rice culture if a good water management system is installed.

Potential is fair for yellow-poplar, sweetgum, and water oak. The major management problem is wetness, which causes equipment limitations and seedling mortality. Using special equipment and logging during the drier seasons can help overcome the wetness problem. Also, drainage systems can help reduce the seedling mortality rate.

This soil has poor potential for urban uses. Wetness, subsidence, and the underlying organic material are major limitations.

Potential is poor for wetland wildlife. Although the soil is saturated most of the year, the surface layer, to a depth of about 18 inches, is commonly dry during the summer. Because of this, wetland areas for wildlife are difficult to maintain.

The capability subclass is IVw; woodland suitability group is 3w.

Use and management of the soils

The soil survey is a detailed inventory and evaluation of the most basic resource of the survey area—the soil. It is useful in adjusting land use, including urbanization, to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in uses of the land.

While a soil survey is in progress, soil scientists, conservationists, engineers, and others keep extensive notes about the nature of the soils and about unique aspects of behavior of the soils. These notes include data on erosion, drought damage to specific crops, yield estimates, flooding, the functioning of septic tank disposal systems, and other factors affecting the productivity, potential, and limitations of the soils under various uses and management. In this way, field experience and measured data on soil properties and performance are used as a basis for predicting soil behavior.

Information in this section is useful in planning use and management of soils for crops and pasture and woodland; as sites for buildings, highways and other transportation systems, sanitary facilities, and parks and other recreation facilities; and for wildlife habitat. From the data presented, the potential of each soil for specified land uses can be determined, soil limitations to these land uses can be identified, and costly failures in houses and other structures, caused by unfavorable soil properties, can be avoided. A site where soil properties are favorable can be selected, or practices that will overcome the soil limitations can be planned.

Planners and others using the soil survey can evaluate the impact of specific land uses on the overall productivity of the survey area or other broad planning area and on the environment. Productivity and the environment are closely related to the nature of the soil. Plans should maintain or create a land use pattern in harmony with the natural soil.

Contractors can find information that is useful in locating sources of sand and gravel, roadfill, and topsoil. Other information indicates the presence of bedrock, wetness, or very firm soil horizons that cause difficulty in excavation.

Health officials, highway officials, engineers, and many other specialists also can find useful information in this soil survey. The safe disposal of wastes, for example, is closely related to properties of the soil. Pavements, sidewalks, campsites, playgrounds, lawns, and trees and shrubs are influenced by the nature of the soil.

Crops and pasture

The major management concerns in the use of the soils for crops and pasture are described in this section. In addition, the crops or pasture plants best suited to the soil, including some not commonly grown in the survey area, are discussed; 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 presented for each soil.

This section provides information about the overall agricultural potential of the survey area and about the management practices that are needed. The information is useful to equipment dealers, land improvement contractors, fertilizer companies, processing companies, planners, conservationists, and others. For each kind of soil, information about management is presented in the section "Soil maps for detailed planning." Planners of management systems for individual fields or farms should also consider the detailed information given in the description of each soil.

Soil erosion is not a major soil problem in Camden and Glynn Counties. However, soil blowing can be a hazard on the sandy soils. It can damage these soils in a few hours if winds are strong and the soils are dry and bare of vegetation and surface mulch. Maintaining vegetative cover, surface mulch, or rough surfaces through proper tillage can minimize soil blowing on these soils.

Erosion caused by tidal action is a problem on the banks of some estuaries (fig. 5). This is a concern if permanent structures are near these banks. This erosion is difficult to control and results in extensive loss of land. Although the use of vegetation has not been successful in controlling this erosion, structural measures have reduced erosion in some places. Information about erosion on banks of estuaries and possible methods of control for specific sites can be obtained from the U.S. Army, Corps of Engineers.

Figure 5.—Erosion of bank caused by tidal stream action on Mandarin fine sand. This hazard is common on soils adjacent to tidal streams.

Soil drainage is the major management need on nearly all the acreage used for crops and pasture in the survey area. Some soils are so naturally wet that the production of crops common to the area is generally not possible. These are the poorly drained and very poorly drained Bladen, Brookman, Meggett, Olustee, Pelham, Rains, Rutlege, Sapelo, and Satilla soils, which cover about 353,700 acres in the survey area. Also in this category are the organic Kingsland soils and the tidal marsh Bohicket and Capers soils which cover about 175,000 acres.

Unless artificially drained, the somewhat poorly drained soils are so wet that crops are damaged during most years. In this category are the Albany, Mandarin, and Pottsburg soils, which cover about 130,000 acres.

The design of both surface and subsurface drainage systems varies with the kind of soil. A combination of surface drainage and subsurface drainage is needed in most areas of the poorly drained and very poorly drained soils used for intensive row cropping. Drains have to be more closely spaced in slowly permeable soils than in the more permeable soils. Subsurface drainage is very slow in Bladen, Brookman, and Meggett soils. Locating adequate outlets is difficult on most of the soils that have a wetness limitation.

Organic soils oxidize and subside when the pore space is filled with air. To reduce this, special drainage systems are needed to control the depth and the period of drainage. Keeping the water table at the level required by crops during the growing season and raising it to the surface during other parts of the year minimizes the oxidation and subsidence of organic soils. Information on drainage design for each kind of soil can be found in the Technical Guide, available in local offices of the Soil Conservation Service.

Soil fertility is naturally low in most of the acid soils on the higher landscapes. The soils on flood plains, such as Kingsland and Meggett soils, range from slightly acid to alkaline and are higher in plant nutrients than most upland soils. Brookman, Pelham, Rains, and Rutlege soils, in depressions, flats, and drainageways, are very strongly acid to alkaline.

Many of the soils on the higher landscapes are naturally very strongly acid. Low pH levels are desirable for crops such as blueberries. If the soils have never been limed, they require applications of ground limestone to raise the pH level sufficiently for good growth of corn and most other crops. Available phosphorus and potash levels are naturally low in most of these soils. On all soils additions of lime and fertilizer should be based on the results of soil tests, on the 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 the infiltration of water into the soil. Soils with good tilth are granular and porous.

Most of the soils used for crops in the survey area have a sandy surface layer that is light in color and low in content of organic matter. These soils have good tilth and can be worked throughout a wide range of moisture conditions.

Bladen, Brookman, and Meggett soils are clayey, and tilth is a problem because the soils often stay wet until late in spring. If they are wet when plowed, they tend to be very cloddy when dry, which makes good seedbeds difficult to prepare. Fall plowing is generally not a good practice because the soils are left unprotected and subject to wind erosion.

Field crops suited to the soils and climate of the survey area include many that are not now commonly grown. Corn, soybeans, and vegetables are the row crops. Grain sorghum, beans, beets, potatoes, and similar crops can be grown if economic conditions are favorable.

Rye and oats are the common close-growing crops. Ryegrass and flax could be grown, and grass seed could be produced from bahiagrass.

Special crops grown commercially in the survey area are vegetables, sugarcane, and nursery plants. Cabbage, squash, and lettuce are grown in the large areas of organic soils north of Woodbine. A small acreage throughout the survey area is used for sweet corn, tomatoes, peppers, and other vegetables and small fruits. In addition, large areas can be adapted to other special crops, such as blueberries, and to many vegetables. Although rice is not grown in the survey area, the potential is good for it.

Deep soils that have good natural drainage and that warm up early in spring are especially well suited to many vegetables and small fruits. In the survey area, this is true of Cainhoy fine sand, 0 to 5 percent slopes. This soil covers about 13,000 acres. Crops can generally be planted and harvested earlier on this soil than on the other soils in the survey area.

If adequately drained, the soils that have a large amount of organic matter, such as Brookman, Kingsland, and Satilla soils, are well suited to a wide range of vegetable crops. These soils cover about 108,000 acres in the survey area.

Excessively drained Fripp soils are not suitable for orchards and nursery plants. Most of the soils are in low areas where air drainage is poor and frost is frequent. Commonly, this causes the soils to be poorly suited to early vegetables, small fruits, and orchards.

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

Yields per acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. Absence of an estimated yield indicates that the soil is not suited to the crop or the crop is not commonly grown on the soil.

The estimated yields were based mainly on the experience and records of farmers, conservationists, and extension agents. Results of field trials and demonstrations and available yield data from nearby counties were also considered.

The yields were estimated assuming that the latest soil and crop management practices were used. Hay and pasture yields were estimated for the most productive varieties of grasses and legumes suited to the climate and the soil. A few farmers may be obtaining average yields higher than those shown in table 5.

The management needed to achieve the indicated yields of the various crops depends on the kind of soil and the crop. Such management provides drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate tillage practices, including time of tillage and seedbed preparation and tilling when soil moisture is favorable; 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 residues, barnyard manure, and green-manure crops; harvesting crops with the smallest possible loss; and timeliness of all fieldwork.

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

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

Capability classes and subclasses

Capability classes and subclasses show, in a general way, the suitability of soils for most kinds of field crops. The soils are classed according to their limitations when they are used for field crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to rice, horticultural crops, or other crops that require special management. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forest trees, or for engineering purposes.

In the capability system, all kinds of soil are grouped at three levels: capability class, subclass, and unit. These levels are defined in the following paragraphs. A survey area may not have soils of all classes.

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

Class I soils have few limitations that restrict their use. There are no class I soils in the survey area.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices. There are no class II soils in the survey area.

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

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

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

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

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

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

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

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

The acreage of soils in each capability class and subclass is indicated in table 6. All soils in the survey area except Beaches are included. Some of the soils that are well suited to crops and pasture may be in low-intensity use. Data in this table can be used to determine the farming potential of such soils.

The capability subclass is identified in the description of each soil map unit in the section "Soil maps for detailed planning."

Woodland management and productivity

W.P. Thompson, forester, Soil Conservation Service, helped prepare this section.

Virgin forest once covered most of the land in Camden and Glynn Counties. At present, about 76 percent of the total land area is in commercial forest. Forty percent is classified as longleaf-slash pine forest type; 18 percent, oak-gum-cypress; 17 percent, oak-pine; 14 percent, oak-hickory; and 11 percent, loblolly-shortleaf pine. The value of the wood products in these counties is high, and the woodland is also important for wildlife, recreation, and conservation of soil and water.

Table 7 contains information useful to woodland owners or forest managers planning use of the soils for wood crops. Only those soils suitable for wood crops are listed, and the ordination (woodland suitability) symbol for each soil is given. All soils bearing the same ordination symbol require the same general kinds of woodland management and have about the same potential productivity.

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

In table 7 the soils are also rated for a number of factors to be considered in management. *Slight, moderate,* and *severe* are used to indicate the degree of major soil limitations.

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

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

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

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

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

Engineering

Hugh Park, civil engineer, Soil Conservation Service, helped prepare this section.

This section provides information about the use of soils for building sites, sanitary facilities, construction material, and water management. Among those who can benefit from this information are engineers, landowners, community planners, town and city managers, land developers, builders, contractors, and farmers and ranchers.

The ratings in the engineering tables are based on test data and estimated data in the "Soil properties" section. The ratings were determined jointly by soil scientists and engineers of the Soil Conservation Service using known relationships between the soil properties and the behavior of soils in various engineering uses.

Among the soil properties and site conditions identified by a soil survey and used in determining the ratings in this section were grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock that is within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure or aggregation, in-place soil density, and geologic origin of the soil material. Where pertinent, data about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of absorbed cations were also considered.

On the basis of information assembled about soil properties, ranges of values can be estimated for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, shear strength, compressibility, slope stability, and other factors of expected soil behavior in engineering uses. As appropriate, these values can be applied to each major horizon of each soil or to the entire profile.

These factors of soil behavior affect construction and maintenance of roads, airport runways, pipelines, foundations for small buildings, ponds and small dams, irrigation projects, drainage systems, sewage and refuse disposal systems, and other engineering works. The ranges of values can be used to (1) select potential residential, commercial, industrial, and recreational areas; (2) make preliminary estimates pertinent to construction in a particular area; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for location of sanitary landfills, onsite sewage disposal systems, and other waste disposal facilities; (5) plan detailed onsite investigations of soils and geology; (6) find sources of gravel, sand, clay, and topsoil; (7) plan farm drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; (8) relate performance of structures already built to the properties of the kinds of soil on which they are built so that performance of similar structures on the same or a similar soil in other locations can be predicted; and (9) predict the trafficability of soils for cross-country movement of vehicles and construction equipment.

Data presented in this section are useful for land use planning and for choosing alternative practices or general designs that will overcome unfavorable soil properties and minimize soil-related failures. Limitations to the use of these data, however, should be well understood. First, the data are generally not presented for soil material below a depth of 5 or 6 feet. Also, because of the scale of the detailed map in this soil survey, small areas of soils that differ from the dominant soil may be included in mapping. Thus, these data do not eliminate the need for onsite investigations, testing, and analysis by personnel having expertise in the specific use contemplated.

The information is presented mainly in tables. Table 8 shows, for each kind of soil, the degree and kind of limitations for building site development; table 9, for sanitary facilities; and table 11, for water management. Table 10 shows the suitability of each kind of soil as a source of construction materials.

The information in the tables, along with the soil map, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations and to construct interpretive maps for specific uses of land.

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

Building site development

The degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, and local roads and streets are indicated in table 8. A *slight* limitation indicates that soil properties generally are favorable for the specified use; any limitation is minor and easily overcome. A *moderate* limitation indicates that soil properties and site features are unfavorable for the specified use, but the limitations can be overcome or minimized by special planning and design. A *severe* limitation indicates that one or more soil properties or site features are so unfavorable or difficult to overcome that a major increase in construction effort, special design, or intensive maintenance is required. For some soils rated severe, such costly measures may not be feasible.

Shallow excavations are made for pipelines, sewerlines, communications and power transmission lines, basements, open ditches, and cemeteries. Such digging or trenching is influenced by soil wetness caused by a seasonal high water table; the texture and consistence of soils; the tendency of soils to cave in or slough; and the presence of very firm, dense soil layers, bedrock, or large stones. In addition, excavations are affected by slope of the soil and the probability of flooding. Ratings do not apply to soil horizons below a depth of 6 feet unless otherwise noted.

In the soil series descriptions, the consistence of each soil horizon is given, and the presence of very firm or extremely firm horizons, usually difficult to excavate, is indicated.

Dwellings and *small commercial buildings* referred to in table 8 are built on undisturbed soil and have foundation loads of a dwelling no more than three stories high. Separate ratings are made for small commercial buildings without basements and for dwellings with and without basements. For such structures, soils should be sufficiently stable that cracking or subsidence of the structure from settling or shear failure of the foundation does not occur. These ratings were determined from estimates of the shear strength, compressibility, and shrink-swell potential of the soil. Soil texture, plasticity and in-place density, potential frost action, soil wetness, and depth to a seasonal high water table were also considered. Soil wetness and depth to a seasonal high water table indicate potential difficulty in providing adequate drainage for basements, lawns, and gardens. Depth to bedrock, slope, and large stones in or on the soil are also important considerations in the choice of sites for these structures and were considered in determining the ratings. Susceptibility to flooding is a serious hazard.

Local roads and streets referred to in table 8 have an all-weather surface that can carry light to medium traffic all year. They consist of a subgrade of the underlying soil material; a base of gravel, crushed rock fragments, or soil material stabilized with lime or cement; and a flexible or rigid surface, commonly asphalt or concrete. The roads are graded with soil material at hand, and most cuts and fills are less than 6 feet deep.

The load supporting capacity and the stability of the soil as well as the quantity and workability of fill material available are important in design and construction of roads and streets. The classifications of the soil and the soil texture, density, shrink-swell potential, and potential frost action are indicators of the traffic supporting capacity used in making the ratings. Soil wetness, flooding, slope, depth to hard rock or very compact layers, and content of large stones affect stability and ease of excavation.

Sanitary facilities

Favorable soil properties and site features are needed for proper functioning of septic tank absorption fields, sewage lagoons, and sanitary landfills. The nature of the soil is important in selecting sites for these facilities and in identifying limiting soil properties and site features to be considered in design and installation. Also, those soil properties that affect ease of excavation or installation of these facilities will be of interest to contractors and local officials. Table 9 shows the degree and kind of limitations of each soil for such uses and for use of the soil as daily cover for landfills. It is important to observe local ordinances and regulations.

If the degree of soil limitation is expressed as *slight*, soils are generally favorable for the specified use and limitations are minor and easily overcome; if *moderate*, soil properties or site features are unfavorable for the specified use, but limitations can be overcome by special planning and design; and if *severe*, soil properties or site features are so unfavorable or difficult to overcome that major soil reclamation, special designs, or intensive maintenance is required. Soil suitability is rated by the terms *good*, *fair*, and *poor*, which, respectively, mean about the same as the terms *slight*, *moderate*, and *severe*.

Septic tank absorption fields are subsurface systems of tile or perforated pipe that distribute effluent from a septic tank into the natural soil. Only the soil horizons between depths of 18 and 72 inches are evaluated for this use. The soil properties and site features considered are those that affect the absorption of the effluent and those that affect the construction of the system.

Properties and features that affect absorption of the effluent are permeability, depth to seasonal high water table, depth to bedrock, and susceptibility to flooding. Stones, boulders, and shallowness to bedrock interfere with installation. Excessive slope can cause lateral seepage and surfacing of the effluent. Also, soil erosion and soil slippage are hazards if absorption fields are installed on sloping soils.

In some soils, loose sand and gravel or fractured bedrock is less than 4 feet below the tile lines. In these soils the absorption field does not adequately filter the effluent, and ground water in the area may be contaminated.

On many of the soils that have moderate or severe limitations for use as septic tank absorption fields, a system to lower the seasonal water table can be installed or the size of the absorption field can be increased so that performance is satisfactory.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons have a nearly level floor and cut slopes or embankments of compacted soil material. Aerobic lagoons generally are designed to hold 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. Soils that are very high in content of organic matter and those that have cobbles, stones, or boulders are not suitable. Unless the soil has very slow permeability, contamination of ground water is a hazard where the seasonal high water table is above the level of the lagoon floor. In soils where the water table is seasonally high, seepage of ground water into the lagoon can seriously reduce the lagoon's capacity for liquid waste. Slope, depth to bedrock, and susceptibility to flooding also affect the suitability of sites for sewage lagoons or the cost of construction. Shear strength and permeability of compacted soil material affect the performance of embankments.

Sanitary landfill is a method of disposing of solid waste by placing refuse in successive layers either in excavated trenches or on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil material. Landfill areas are subject to heavy vehicular traffic. Risk of polluting ground water and trafficability affect the suitability of a soil for this use. The best soils have a loamy or silty texture, have moderate to slow permeability, are deep to a seasonal water table, and are not subject to flooding. Clayey soils are likely to be sticky and difficult to spread. Sandy or gravelly soils generally have rapid permeability, which might allow noxious liquids to contaminate ground water. Soil wetness can be a limitation, because operating heavy equipment on a wet soil is difficult. Seepage into the refuse increases the risk of pollution of ground water.

Ease of excavation affects the suitability of a soil for the trench type of landfill. A suitable soil is deep to bedrock and free of large stones and boulders. If the seasonal water table is high, water will seep into trenches.

Unless otherwise stated, the limitations in table 9 apply only to the soil material within a depth of about 6 feet. If the trench is deeper, a limitation of slight or moderate may not be valid. Site investigation is needed before a site is selected.

Daily cover for landfill should be soil that is easy to excavate and spread over the compacted fill in wet and dry periods. Soils that are loamy or silty and free of stones or boulders are better than other soils. Clayey soils may be sticky and difficult to spread; sandy soils may be subject to soil blowing.

The soils selected for final cover of landfills should be suitable for growing plants. Of all the horizons, the A horizon in most soils has the best workability, more organic matter, and the best potential for growing plants. Thus, for either the area- or trench-type landfill, stockpiling material from the A horizon for use as the surface layer of the final cover is desirable.

If it is necessary to bring in soil material for daily or final cover, thickness of suitable soil material available and depth to a seasonal high water table in soils surrounding the sites should be evaluated. Other factors to be evaluated are those that affect reclamation of the borrow areas. These factors include slope, erodibility, and potential for plant growth.

Construction materials

The suitability of each soil as a source of roadfill, sand, gravel, and topsoil is indicated in table 10 by ratings of good, fair, or poor. The texture, thickness, and organic-matter content of each soil horizon are important factors in rating soils for use as construction materials. Each soil is evaluated to the depth observed, generally about 6 feet.

Roadfill is soil material used in embankments for roads. Soils are evaluated as a source of roadfill for low embankments, which generally are less than 6 feet high and less exacting in design than high embankments. The ratings reflect the ease of excavating and working the material and the expected performance of the material where it has been compacted and adequately drained. The performance of soil after it is stabilized with lime or cement is not considered in the ratings, but information about some of the soil properties that influence such performance is given in the descriptions of the soil series.

The ratings apply to the soil material between the A horizon and a depth of 5 to 6 feet. It is assumed that soil horizons will be mixed during excavation and spreading. Many soils have horizons of contrasting suitability within their profile. The estimated engineering properties in table 14 provide specific information about the nature of each horizon. This information can help determine the suitability of each horizon for roadfill.

Soils rated *good* are coarse grained. They have low shrink-swell potential, low frost action potential, and few cobbles and stones. They are at least moderately well drained and have slopes of 15 percent or less. Soils rated *fair* have a plasticity index of less than 15 and have other limiting features, such as moderate shrink-swell potential, moderately steep slopes, wetness, or many stones. If the thickness of suitable material is less than 3 feet, the entire soil is rated *poor*.

Sand and *gravel* are used in great quantities in many kinds of construction. The ratings in table 10 provide guidance as to where to look for probable sources and are based on the probability that soils in a given area contain sizable quantities of sand or gravel. A soil rated *good* or *fair* has a layer of suitable material at least 3 feet thick, the top of which is within a depth of 6 feet. Coarse fragments of soft bedrock material, such as shale and siltstone, are not considered to be sand and gravel. Fine-grained soils are not suitable sources of sand and gravel.

The ratings do not take into account depth to the water table or other factors that affect excavation of the material. Descriptions of grain size, kinds of minerals, reaction, and stratification are given in the soil series descriptions and in table 14.

Topsoil is used in areas where vegetation is to be established and maintained. Suitability is affected mainly by the ease of working and spreading the soil material in preparing a seedbed and by the ability of the soil material to support plantlife. Also considered is the damage that can result at the area from which the topsoil is taken.

The ease of excavation is influenced by the thickness of suitable material, wetness, slope, and amount of stones. The ability of the soil to support plantlife is determined by texture, structure, and the amount of soluble salts or toxic substances. Organic matter in the A1 or Ap horizon greatly increases the absorption and retention of moisture and nutrients. Therefore, the soil material from these horizons should be carefully preserved for later use.

Soils rated *good* have at least 16 inches of friable loamy material at their surface. They are free of stones and cobbles, are low in content of gravel, and have gentle slopes. They are low in soluble salts that can restrict plant growth. They are naturally fertile or respond well to fertilizer. They are not so wet that excavation is difficult during most of the year.

Soils rated *fair* are loose sandy soils or firm loamy or clayey soils in which the suitable material is only 8 to 16 inches thick or soils that have appreciable amounts of gravel, stones, or soluble salt.

Soils rated *poor* are very sandy soils or very firm clayey soils; soils that have suitable layers less than 8 inches thick; soils that have large amounts of gravel, stones, or soluble salt; steep soils; and poorly drained soils.

Although a rating of *good* is not based entirely on high content of organic matter, a surface horizon is generally preferred for topsoil because of its organic-matter content. This horizon is designated as A1 or Ap in the soil series descriptions. The absorption and retention of moisture and nutrients for plant growth are greatly increased by organic matter.

Water management

Many soil properties and site features that affect water management practices have been identified in this soil survey. In table 11 the degree of soil limitation and soil and site features that affect use are indicated for each kind of soil. This information is significant in planning, installing, and maintaining water control structures.

Soil and site limitations are expressed as slight, moderate, and severe. *Slight* means that the soil properties and site features are generally favorable for the specified use and that any limitation is minor and easily overcome. *Moderate* means that some soil properties or site features are unfavorable for the specified use but can be overcome or modified by special planning and design. *Severe* means that the soil properties and site features are so unfavorable and so difficult to correct or overcome that major soil reclamation, special design, or intensive maintenance is required.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have a low seepage potential, which is determined by permeability and the depth to fractured or permeable bedrock or other permeable material.

Embankments, dikes, and levees require soil material that is resistant to seepage, erosion, and piping and has favorable stability, shrink-swell potential, shear strength, and compaction characteristics. Large stones and organic matter in a soil downgrade the suitability of the soil for use in embankments, dikes, and levees.

Aquifer-fed excavated ponds are bodies of water made by excavating a pit or dugout into a ground-water aquifer. Excluded are ponds that are fed by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Ratings in table 11 are for ponds that are properly designed, located, and constructed. Soil properties and site features that affect aquifer-fed ponds are depth to a permanent water table, permeability of the aquifer, quality of the water, and ease of excavation.

Drainage of soil is affected by such soil properties as permeability; texture; depth to bedrock, hardpan, or other layers that affect the rate of water movement; depth to the water table; slope; stability of ditchbanks; susceptibility to flooding; salinity and alkalinity; and availability of outlets for drainage.

Irrigation is affected by such features as slope, susceptibility to flooding, hazards of water erosion and soil blowing, texture, presence of salts and alkali, depth of root zone, rate of water intake at the surface, permeability of the soil below the surface layer, available water capacity, need for drainage, and depth to the water table.

Grassed waterways are constructed to channel runoff to outlets at a nonerosive velocity. Features that affect the use of soils for waterways are slope, permeability, erodibility, wetness, and suitability for permanent vegetation.

Recreation

The major recreation facilities in the survey area are on the coastal islands or near the larger towns. The potential is very high for fishing in both tidal and nontidal rivers and creeks. The potential is good throughout the counties for hunting deer, wild hogs, and turkey. The tidal marsh areas provide good hunting for marsh hens and ducks.

The soils of the survey area are rated in table 12 according to limitations that affect their suitability for recreation uses. The ratings are based on such restrictive soil features as flooding, wetness, slope, and texture of the surface layer. Not considered in these ratings, but important in evaluating a site, are location and accessibility of the area, size and shape of the area and its scenic quality, the ability of the soil to support vegetation, access to water, potential water impoundment sites available, and either access to public sewerlines or capacity of the soil to absorb septic tank effluent. Soils subject to flooding are limited, in varying degree, for recreation use by the duration and intensity of flooding and the season when flooding occurs. Onsite assessment of height, duration, intensity, and frequency of flooding is essential in planning recreation facilities.

The degree of the limitation of the soils is expressed as slight, moderate, or severe. *Slight* means that the soil properties are generally favorable and that the limitations are minor and easily overcome. *Moderate* means that the 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 12 can be supplemented by information in other parts of this survey. Especially helpful are interpretations for septic tank absorption fields, given in table 9, and interpretations for dwellings without basements and for local roads and streets, given in table 8.

Camp areas require such site preparation as shaping and leveling for 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 for this use have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing camping sites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for use as picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that will 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 or boulders, is firm after rains, and is not dusty when dry. If shaping is required to obtain a uniform grade, the depth of the soil over bedrock or hardpan should be enough to allow necessary grading.

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

Wildlife habitat

Jesse Mercer, Jr., biologist, Soil Conservation Service, helped prepare this section.

The survey area is very diverse in plant and animal life. Plant life includes salt, brackish, and freshwater communities. Deer, raccoon, squirrel, and many songbirds and other nongame animals are common to woodland areas. Although rabbits are relatively abundant in marshlands, quail and dove populations are low because of the small acreage of cropland.

Birds and mammals requiring aquatic habitats are numerous. The survey area attracts thousands of migratory waterfowl each year.

Sport and commercial species of fish are abundant in the many bays, sounds, and rivers throughout the area.

Soils directly affect the kind and amount of vegetation that is available to wildlife as food and cover, and they affect the construction of water impoundments. The kind and abundance of wildlife that populate an area depend largely on the amount and distribution of food, cover, and water. If any one of these elements is missing, is inadequate, or is inaccessible, wildlife either are scarce or do not inhabit the area.

If the soils have the potential, wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by helping the natural establishment of desirable plants.

In table 13, the soils in the survey area are rated according to their potential to support the main kinds of wildlife habitat in the area. This information can be used in planning for parks, wildlife refuges, nature study areas, and other developments for wildlife; selecting areas that are suitable for wildlife; selecting soils that are suitable for creating, improving, or maintaining specific elements of wildlife habitat; and 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* means that the element of wildlife habitat or the kind of habitat is easily created, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected if the soil is used for the designated purpose. A rating of *fair* means that the element of wildlife habitat or kind of habitat can be created, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* means that limitations are severe for the designated element or kind of wildlife habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* means that restrictions for the element of wildlife habitat or kind of habitat are very severe and that unsatisfactory results can be expected. Wildlife habitat is impractical or even impossible to create, improve, or maintain on soils having such a rating.

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

Grain and seed crops are seed-producing annuals used by wildlife. The major soil properties 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, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, sorghum, wheat, oats, barley, millet, cowpeas, soybeans, and sunflowers.

Grasses and legumes are domestic perennial grasses and herbaceous legumes that are planted for wildlife food and cover. Major soil properties that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, lovegrass, clover, cowpeas, rescuegrass, and ryegrass.

Wild herbaceous plants are native or naturally established grasses, legumes, and forbs, including weeds, that provide food and cover for wildlife. Major soil properties that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, indiangrass, goldenrod, beggarweed, pokeweed, partridgepea, fescue, ragweed, croton, and lespedeza.

Hardwood trees and the associated woody understory provide cover for wildlife and produce nuts or other fruit, buds, catkins, twigs, bark, or foliage that wildlife eat. Major soil properties that affect growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of hardwood plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, persimmon, sassafras, sumac, hazelnut, black walnut, grape, blackhaw, viburnum, blueberry, bayberry, and briers. Examples of fruit-producing shrubs that are commercially available and suitable for planting on soils rated *good* are autumn-olive and crabapple.

Coniferous plants are cone-bearing trees, shrubs, or ground cover plants that furnish habitat or supply food in the form of browse, seeds, or fruitlike cones. Soil properties that have a major effect on the growth of coniferous plants are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, yew, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites, exclusive of submerged or floating aquatics. They produce food or cover for wildlife that use wetland as habitat. Major soil properties affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, and slope. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, and cordgrass and rushes, sedges, and reeds.

Shallow water areas are bodies of water that have an average depth of less than 5 feet and that are useful to wildlife. They can be naturally wet areas, or they can be created by dams or levees or by water-control structures in marshes or streams. Major soil properties affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. The availability of a dependable water supply is important if water areas are to be developed. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The kinds of wildlife habitat are briefly described in the following paragraphs.

Openland habitat 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 kinds of wildlife attracted to these areas include bobwhite quail, meadowlark, field sparrow, cottontail rabbit, and red fox.

Woodland habitat consists of areas of hardwoods or conifers, or a mixture of both, and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, deer, and bear.

Wetland habitat consists of open, marshy or swampy, shallow water areas where water-tolerant plants grow. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Soil properties

Extensive data about soil properties are summarized on the following pages. The two main sources of these data are the many thousands of soil borings made during the course of the survey and the laboratory analyses of selected soil samples from typical profiles.

In making soil borings during field mapping, soil scientists can identify several important soil properties. They note the seasonal soil moisture condition or the presence of free water and its depth. For each horizon in the profile, they note the thickness and color of the soil material; the texture, or amount of clay, silt, sand, and gravel or other coarse fragments; the structure, or the natural pattern of cracks and pores in the undisturbed soil; and the consistence of the soil material in place under the existing soil moisture conditions. They record the depth of plant roots, determine the pH or reaction of the soil, and identify any free carbonates.

Samples of soil material are analyzed in the laboratory to verify the field estimates of soil properties and to determine all major properties of key soils, especially properties that cannot be estimated accurately by field observation. Laboratory analyses are not conducted for all soil series in the survey area, but laboratory data for many soil series not tested are available from nearby survey areas.

The available field and laboratory data are summarized in tables. The tables give the estimated range of engineering properties, the engineering classifications, and the physical and chemical properties of each major horizon of each soil in the survey area. They also present data about pertinent soil and water features, engineering test data, and data obtained from physical and chemical laboratory analyses of soils.

Engineering index properties

Table 14 gives estimates of engineering properties and classifications for the major horizons of each soil in the survey area.

Most soils have, within the upper 5 or 6 feet, horizons of contrasting properties. Table 14 gives information for each of these contrasting horizons in a typical profile. *Depth* to the upper and lower boundaries of each horizon is indicated. More information about the range in depth and about other properties in each horizon is given for each soil series in the section "Soil series and morphology."

Texture is described in table 14 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 soil material that is less than 2 millimeters in diameter. "Loam," for example, is soil material that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If a soil contains gravel or other particles coarser than sand, an appropriate modifier is added, for example, "gravelly loam." Other texture terms are defined in the Glossary.

The two systems commonly used in classifying soils for engineering use are the Unified Soil Classification System (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO) (*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, plasticity index, liquid limit, and organic-matter content. Soils are grouped into 15 classes—eight classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils, identified as ML, CL, OL, MH, CH, and OH; and one class of highly organic soils, identified as Pt. Soils on the borderline between two classes have a dual classification symbol, for example, CL-ML.

The *AASHTO* system classifies soils according to those properties that affect their use in highway construction and maintenance. In this system a mineral soil is classified in one of seven basic groups ranging 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. At the other extreme, in group A-7, are fine-grained soils. Highly organic soils are classified in group A-8 on the basis of visual inspection.

When laboratory data are available, the A-1, A-2, and A-7 groups are further classified as follows: A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, and A-7-6. As an additional refinement, the desirability of soils as subgrade material can be indicated by a group index number. These numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested in the survey area, with group index numbers in parentheses, is given in table 17. The estimated classification, without group index numbers, is given in table 14. Also in table 14 the percentage, by weight, of rock fragments more than 3 inches in diameter is estimated for each major horizon. These estimates are determined mainly by observing volume percentage in the field and then converting that, by formula, to weight percentage.

Percentage of the soil material less than 3 inches in diameter that passes each of four sieves (U.S. standard) is estimated for each major horizon. The estimates are based on tests of soils that were sampled in the survey area and in nearby areas and on field estimates from many borings made during the survey.

Liquid limit and *plasticity index* indicate the effect of water on the strength and consistence of soil. These indexes are used in both the Unified and AASHTO soil classification systems. They are also used as indicators in making general predictions of soil behavior. Range in liquid limit and plasticity index are estimated on the basis of test data from the survey area or from nearby areas and on observations of the many soil borings made during the survey.

Physical and chemical properties

Table 15 shows estimated values for several soil characteristics and features that affect behavior of soils in engineering uses. These estimates are given for each major horizon, at the depths indicated, in the typical pedon of each soil. The estimates are based on field observations and on test data for these and similar soils.

Permeability is estimated on the basis of known relationships among the soil characteristics observed in the field—particularly soil structure, porosity, and gradation or texture—that influence the downward movement of water in the soil. The estimates are for vertical water movement when the soil is saturated. Not considered in the estimates is lateral seepage or such transient soil features as plowpans and surface crusts. Permeability of the soil is an important factor to be considered in planning and designing drainage systems, in evaluating the potential of soils for septic tank systems and other waste disposal systems, and in many other aspects of land use and management.

Available water capacity is rated on the basis of soil characteristics that influence the ability of the soil to hold water and make it available to plants. Important characteristics are content of organic matter, soil texture, and soil structure. Shallow-rooted plants are not likely to use the available water from the deeper soil horizons. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design of irrigation systems. It is expressed as inches of water per inch of soil.

Soil reaction is expressed as a range in pH values. The range in pH of each major horizon is based on many field checks. For many soils, the values have been verified by laboratory analyses. Soil reaction is important in selecting the crops, ornamental plants, or other plants to be grown; in evaluating soil amendments for fertility and stabilization; and in evaluating the corrosivity of soils.

Salinity 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 the nonirrigated soils. The salinity of individual irrigated fields is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of individual fields can differ greatly from the value given in table 15. Salinity affects the suitability of a soil for crop production, its stability when used as a construction material, and its potential to corrode metal and concrete.

Shrink-swell potential depends mainly on the amount and kind of clay in the soil. Laboratory measurements of the swelling of undisturbed clods were made for many soils. For others the swelling was estimated on the basis of the kind and amount of clay in the soil and on measurements of similar soils. The size of the load and the magnitude of the change in soil moisture content also influence the swelling of soils. Shrinking and swelling of some soils can cause damage to building foundations, basement walls, roads, and other structures unless special designs are used. A high shrink-swell potential indicates that special design and added expense may be required if the planned use of the soil will not tolerate large volume changes.

Erosion factors are used to predict the erodibility of a soil and its tolerance to erosion in relation to specific kinds of land use and treatment. The soil erodibility factor (K) is a measure of the susceptibility of the soil to erosion by water. Soils having the highest K values are the most erodible. K values range from 0.10 to 0.64. To estimate annual soil loss per acre, the K value of a soil is modified by factors representing plant cover, grade and length of slope, management practices, and climate. The soil-loss tolerance factor (T) is the maximum rate of soil erosion, whether from rainfall or soil blowing, that can occur without reducing crop production or environmental quality. The rate is expressed in tons of soil loss per acre per year.

Soil and water features

Table 16 contains information helpful in planning land uses and engineering projects that are likely to be affected by soil and water features.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are placed in one of four groups on the basis of the intake of water after the soils have been wetted and have received 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 chiefly of deep, well drained to excessively drained sands or gravels. 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 that have a layer that impedes the downward movement of water or soils that have 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 clay soils that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding is the temporary covering of soil with water from overflowing streams, with runoff from adjacent slopes, and by tides. Water standing for short periods after rains or after snow melts is not considered flooding, nor is water in swamps and marshes. Flooding is rated in general terms that describe the frequency and duration of flooding and the time of year when flooding is most likely. The ratings are based on evidence in the soil profile of the effects of flooding, namely thin strata of gravel, sand, silt, or, in places, clay deposited by floodwater; irregular decrease in organic-matter content with increasing depth; and absence of distinctive soil horizons that form in soils of the area that are not subject to flooding. The ratings are also based on local information about floodwater levels in the area and the extent of flooding; and on information that relates the position of each soil on the landscape to historic floods.

The generalized description of flood hazards is of value in land-use planning and provides a valid basis for land-use restrictions. The soil data are less specific, however, than those provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table is the highest level of a saturated zone more than 6 inches thick for a continuous period of more than 2 weeks during most years. The depth to a seasonal high water table applies to undrained soils. Estimates are based mainly on the relationship between grayish colors or mottles in the soil and the depth to free water observed in many borings made during the course of the soil survey. Indicated in table 16 are the depth to the seasonal high water table; the kind of water table, that is, perched, artesian, or apparent; and the months of the year that the water table commonly is high. Only saturated zones above a depth of 5 or 6 feet are indicated.

Information about the seasonal high water table helps in assessing the need for specially designed foundations, the need for specific kinds of drainage systems, and the need for footing drains to insure dry basements. Such information is also needed to decide whether or not construction of basements is feasible and to determine how septic tank absorption fields and other underground installations will function. Also, a seasonal high water table affects ease of excavation.

Subsidence is the settlement of organic soils or of soils containing semifluid layers. Initial subsidence generally results from drainage. Total subsidence is initial subsidence plus the slow sinking that occurs over a period of several years as a result of the oxidation or compression of organic material.

Risk of corrosion pertains to potential soil-induced chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to soil moisture, particle-size distribution, total acidity, and electrical conductivity of the soil material. The rate of corrosion of concrete is based mainly on the sulfate content, texture, and acidity of the soil. Protective measures for steel or more resistant concrete help to avoid or minimize damage resulting from the corrosion. Uncoated steel intersecting soil boundaries or soil horizons is more susceptible to corrosion than an installation that is entirely within one kind of soil or within one soil horizon.

Engineering test data

The results of analyses of engineering properties of several typical soils of the survey area are given in table 17.

The data presented are for soil samples that were collected from carefully selected sites. The soil profiles sampled are typical of the series and are discussed in the section "Soil series and morphology." The soil samples were analyzed by the Office of Materials and Research, Georgia Department of Transportation.

The methods used in obtaining the data are listed by code in the next paragraph. Most of the codes, in parentheses, refer to the methods assigned by the American Association of State Highway and Transportation Officials (*1*). The codes for Unified (*2*) classification were assigned by the American Society for Testing and Materials.

The methods and codes are AASHTO classification (M-145); Unified classification (D-2487); mechanical analysis (T88); liquid limit (T89); plasticity index (T90); moisture-density, method A (T99); volume change (ABER).

Soil series and morphology

In this section, each soil series recognized in the survey area is described in detail. The descriptions are arranged in alphabetic order by series name.

Characteristics of the soil and the material in which it formed are discussed for each series. The soil is then compared to similar soils and to nearby soils of other series. Then a pedon, a small three-dimensional area of soil that is typical of the soil series in the survey area, is described. The detailed descriptions of each soil horizon follow standards in the Soil Survey Manual (*5*). Unless otherwise noted, colors described are for moist soil.

Following the pedon description is the range of important characteristics of the soil series in this survey area. Phases, or map units, of each soil series are described in the section "Soil maps for detailed planning."

Albany series

The Albany series consists of deep, somewhat poorly drained soils that are rapidly permeable in the surface layer and thick subsurface layer and moderately permeable in the subsoil. These nearly level soils formed in sandy and loamy marine sediment and are on broad ridges of the Atlantic Coast. The water table is 12 to 30 inches below the surface during winter and early in spring. Slope ranges from 0 to 2 percent.

Albany soils are closely associated geographically with poorly drained Olustee, Pelham, Rains, and Sapelo soils. Olustee and Sapelo soils have a spodic horizon. In addition, Olustee soils have a Btg horizon within 40 inches of the surface. Pelham and Rains soils are on lowland flats and in depressions and drainageways. Pelham soils have a Bt horizon within 40 inches of the surface. Rains soils have a Bt horizon within 20 inches of the surface.

Typical pedon of Albany fine sand in area of Albany fine sand, 0 to 2 percent slopes, in woodland plantation 3.7 miles north of Georgia Highway 32, about 2.8 miles north of Church of Christ on U.S. Highway 341, 100 feet east of highway; Glynn County:

A1—0 to 8 inches; dark grayish brown (10YR 4/2) fine sand; weak fine granular structure; loose, very friable, nonsticky; common fine and medium roots; very strongly acid; clear wavy boundary.

A21—8 to 26 inches; very pale brown (10YR 7/4) fine sand; common medium faint light gray (10YR 7/2) mottles; single grained; loose, very friable, nonsticky; few fine roots; specks of charcoal; very strongly acid; gradual wavy boundary.

A22—26 to 48 inches; very pale brown (10YR 7/4) fine sand; common medium distinct yellowish brown (10YR 5/8) and light gray (10YR 7/1) mottles; weak medium granular structure; loose; very friable, nonsticky; very strongly acid; gradual wavy boundary.

B21t—48 to 65 inches; brownish yellow (10YR 6/6) sandy clay loam; common medium and fine distinct light gray (10YR 7/1) and strong brown (7.5YR 5/8) mottles and few medium prominent red (2.5YR 4/6) mottles; weak fine subangular blocky structure; slightly hard, friable, slightly sticky; sand grains bridged with clay; very strongly acid; gradual wavy boundary.

B22t—65 to 80 inches; mottled light gray (10YR 7/1), brownish yellow (10YR 6/8), and red (2.5YR 4/8) sandy clay loam; weak medium subangular blocky structure; slightly hard, friable, slightly sticky; sand grains bridged with clay; very strongly acid.

Solum thickness ranges from 65 to 80 inches or more. The soil ranges from very strongly acid to medium acid except in the surface layer of limed areas. Depth to the Bt horizon ranges from 46 to 60 inches.

The A1 or Ap horizon is 5 to 8 inches thick. It has hue of 10YR, value of 3 to 5, and chroma of 1 or 2.

The A2 horizon is 40 to 52 inches thick. It has hue of 10YR and 2.5Y, value of 5 to 8, and chroma of 2 to 6. Mottles, if present, are few or common, fine or medium, gray, brown, yellow, olive, and red throughout.

The B21t horizon is 6 to 18 inches thick. It has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 4 or 6. Common or many, medium brown, yellow, and gray mottles are throughout. The horizon is sandy clay loam or sandy loam.

The B22t horizon is 15 inches or more thick. It is mottled in hue of 2.5YR, 10YR, or 2.5Y; value of 4 to 7; and chroma of 1 to 8; or the matrix has hue of 10YR to 5Y, value of 6 or 7, and chroma of 1 or 2, with few to many brown, red, and yellow mottles.

Bladen series

The Bladen series consists of deep, poorly drained, slowly permeable soils that formed in thick clayey marine sediment. These nearly level soils are on broad, low flats and in small isolated depressions of the Pamlico Shoreline Complex. The water table is less than 12 inches below the surface during winter and early in spring. Slope is dominantly less than 1 percent, but ranges to 2 percent along drainageways.

Bladen soils are closely associated geographically with Brookman, Meggett, Pelham, and Rains soils. Brookman soils have an umbric epipedon. Meggett soils are slightly acid to mildly alkaline in the Bt horizon. Pelham soils have a sandy A horizon 20 to 40 inches thick. Rains soils do not have an abrupt textural change between the A horizon and B horizon and are fine-loamy within the control section.

Typical pedon of Bladen loam in woodland plantation 0.5 mile west of Waverly and U.S. Highway 17 on Georgia Highway 110, 1,200 feet north of highway; Camden County:

Ap—0 to 5 inches; dark gray (10YR 4/1) loam; weak fine granular structure parting to subangular blocky; slightly hard, friable, slightly sticky; many fine and very fine roots; very strongly acid; clear smooth boundary.

B21tg—5 to 20 inches; gray (10YR 5/1) clay; many medium distinct yellowish brown (10YR 5/8) mottles; moderate fine subangular blocky structure; hard, firm, plastic; many fine roots; few thin patchy clay films on faces of peds; very strongly acid; clear smooth boundary.

B22tg—20 to 28 inches; gray (10YR 5/1) clay; many medium distinct yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; very hard, firm, plastic; few very fine roots; few thin patchy clay films on faces of peds; very strongly acid; gradual smooth boundary.

B23tg—28 to 35 inches; light gray (10YR 6/1) clay; many medium distinct yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; very hard, firm, plastic; few very fine roots; few thick patchy clay films on faces of peds; very strongly acid; gradual smooth boundary.

B24tg—35 to 60 inches; light gray (10YR 6/1) clay; many medium distinct yellowish brown (10YR 5/8) mottles and common medium prominent yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; very hard, firm, plastic; few very fine roots; few thick patchy clay films on faces of peds; very strongly acid; gradual smooth boundary.

B25tg—60 to 65 inches; mottled light gray (5Y 6/1), yellowish brown (10YR 5/8), yellowish red (5YR 5/8), greenish gray (5GY 6/1), and dark gray (N 4/0) clay; weak fine subangular blocky structure; very hard, firm, plastic; few thin patchy clay films on faces of peds; very strongly acid.

Solum thickness ranges from 60 to 80 inches. The soil is strongly acid to extremely acid except in the surface layer of limed areas.

The A horizon is less than 6 inches thick in more than 50 percent of any pedon, but ranges to 10 inches thick. It has hue of 10YR and 2.5Y, value of 3 to 5, and chroma of 1 or 2.

The Btg horizon is 55 to 75 inches thick. It has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1. Mottles are few to many, fine or medium, brown and red. They have hue of 5Y to 2.5YR, value of 4 to 7, and chroma of 1 to 8. This horizon is sandy clay or clay and has thin to thick clay films on faces of most peds.

Bohicket series

The Bohicket series consists of deep, very poorly drained, very slowly permeable soils that formed in thick clayey marine sediment. These level soils border the Atlantic Ocean and are on broad tidal marshes on the Silver Bluff Shoreline Complex. Bohicket soils are flooded by seawater twice each day. Slope is less than 1 percent.

Bohicket soils are closely associated geographically with Capers, Duckston, and Fripp soils. Capers soils are slightly higher and have an *n* value of less than 1. Poorly drained Duckston soils and excessively drained Fripp soils are sandy throughout. These soils are not flooded daily by the tide. Fripp soils are on dunes.

Typical pedon of Bohicket silty clay loam in area of Bohicket-Capers association, in broad level tidal marsh 500 feet south of St. Simons Island causeway, 1,300 feet east of Terry Creek; Glynn County:

A1—0 to 8 inches; dark gray (5Y 4/1) silty clay loam; massive; very sticky; about 60 percent of layer is large live and dead grass roots; upper 2 inches is very dark gray (10YR 3/1), soil flows readily between the fingers if squeezed (*n* value 1.0 or more); neutral; gradual wavy boundary.

C1g—8 to 36 inches; dark greenish gray (5GY 4/1) silty clay; massive; very sticky; about 30 percent of layer is mostly dead fibrous grass roots; soil flows easily between the fingers if squeezed, and no soil remains in hand (*n* value 1.0 or more); neutral; gradual discontinuous boundary.

C2g—36 to 65 inches; dark greenish gray (5GY 4/1) clay; massive; very sticky; about 10 percent of layer is dead fibrous grass roots; soil flows easily between fingers if squeezed, and no soil remains in hand (*n* value 1.0 or more); moderately alkaline.

Bohicket soils range from slightly acid to moderately alkaline and have high to very high salinity. The *n* value of the soil within the 10- to 40-inch control section is 1.0 or more.

The A horizon is more than 6 inches thick in 75 percent of any pedon, and ranges to 10 inches thick. It has hue of 10YR or 5Y, value of 2 to 4, and chroma of 1 or 2. This horizon has many medium coarse pithy fibrous roots.

The Cg horizon has hue of 5GY, 5Y, or 5G; value of 4 or 5; and chroma of 1. It is silty clay or clay. The 10- to 40-inch control section has a clay content of 40 to 50 percent and a silt content of 30 to 50 percent. About 10 to 30 percent of the Cg horizon is dead fibrous grass roots.

Brookman series

The Brookman series consists of deep, very poorly drained, slowly permeable soils that formed in thick clayey marine sediment. These nearly level soils are in broad, shallow depressions of the Pamlico Shoreline Complex. The water table is less than 12 inches below the surface from fall until late in spring. Slope is less than 1 percent.

Brookman soils are closely associated geographically with Bladen and Meggett soils. Bladen and Meggett soils are somewhat better drained and do not have an umbric epipedon. In addition, Bladen soils have less than 35 percent base saturation in the argillic horizon.

Typical pedon of Brookman clay loam, in wooded area 1.8 miles north of Kingsland city limits, 0.75 mile south of Harriet's Bluff Road on U.S. Highway 17, 150 feet west of highway; Camden County:

A11—0 to 10 inches; black (10YR 2/1) clay loam; weak fine granular structure; slightly hard, friable, sticky; many fine and medium tree and shrub roots; strongly acid; clear wavy boundary.

A12—10 to 15 inches; very dark gray (10YR 3/1) clay; weak fine subangular blocky structure; slightly hard, firm, very sticky; common fine and medium roots; strongly acid; gradual wavy boundary.

B21tg—15 to 33 inches; dark gray (10YR 4/1) clay; few fine distinct brownish yellow mottles; weak medium subangular blocky structure; hard, firm, very sticky; few fine and common medium and large tree roots; continuous clay film on faces of peds; common nodules of calcium carbonate in pockets; strongly acid; gradual wavy boundary.

B22tg—33 to 58 inches; grayish brown (10YR 5/2) clay; common medium distinct brownish yellow (10YR 6/8) and gray (N 5/0) mottles; moderate medium subangular blocky structure; hard, firm, very sticky; continuous clay film on faces of peds; many coarse nodules of calcium carbonate in pockets; slightly acid; gradual wavy boundary.

B3g—58 to 65 inches; coarsely mottled gray (10YR 6/1), yellowish brown (10YR 5/8), and greenish gray (5G 5/1) clay; weak medium subangular blocky structure; hard, firm, sticky; many coarse nodules of calcium carbonate in pockets; neutral.

Solum thickness ranges from 50 to 90 inches. Reaction ranges from strongly acid to slightly acid in the A and upper B horizons and strongly acid to mildly alkaline in the lower B horizon.

The A horizon is commonly 10 to 15 inches thick but ranges to as much as 20 inches. It has hue of 7.5YR to 2.5Y, value of 2 or 3, and chroma of 1 or 2.

The Btg horizon is 40 to 70 inches thick. It has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2. It is clay or sandy clay. The clay content in the upper 20 inches of the argillic horizon ranges from 40 to 55 percent. Few or common, fine or medium, yellow, brown, red, and olive mottles are throughout the horizon.

The B3g horizon is mottled in hue of 5YR to 5G, value of 3 to 7, and chroma of 1 to 8. It is clay or sandy clay. Fine concretions of calcium carbonate range from none to many.

Cainhoy series

The Cainhoy series consists of deep, somewhat excessively drained, rapidly permeable soils that formed in sandy marine sediment. These soils are on broad, nearly level, and gently sloping ridgetops of the Talbot and Princess Ann Shoreline Complexes. Slope ranges from 0 to 5 percent.

Cainhoy soils are closely associated geographically with Mandarin, Pottsburg, and Rutlege soils. Somewhat poorly drained Mandarin soils have a Bh horizon within a depth of 30 inches and a B'h horizon within a depth of 70 inches. Somewhat poorly drained Pottsburg soils have a Bh horizon within a depth of 50 inches. Very poorly drained Rutlege soils are in lower concave depressions. In addition, Rutlege soils have an umbric epipedon and do not have a Bh horizon.

Typical pedon of Cainhoy fine sand in an area of Cainhoy fine sand, 0 to 5 percent slopes, in wooded plantation 2.0 miles south of Crooked River State Park on Highway 40 spur, 6.5 miles north of St. Marys, on Highway 40 spur, 100 feet east of highway; Camden County:

A1—0 to 5 inches; dark gray (10YR 4/1) fine sand; single grained; loose, very friable, nonsticky; many fine and medium roots; very strongly acid; clear smooth boundary.

B21—5 to 18 inches; brownish yellow (10YR 6/6) fine sand; single grained; slightly hard, very friable, nonsticky; many fine roots; strongly acid; gradual wavy boundary.

B22—18 to 40 inches; very pale brown (10YR 7/4) fine sand; single grained; slightly hard, very friable, nonsticky; common fine and medium roots; strongly acid; gradual wavy boundary.

B23—40 to 50 inches; very pale brown (10YR 7/4) fine sand; few fine faint pale brown mottles, common medium distinct reddish yellow (7.5YR 6/8) mottles, and a few medium distinct light gray (2.5Y 7/2) mottles; single grained; slightly hard, very friable, nonsticky; strongly acid; gradual wavy boundary.

A'21—50 to 65 inches; light gray (2.5Y 7/2) fine sand; few fine faint pale brown mottles and common fine faint olive yellow mottles; single grained; slightly hard, very friable, nonsticky; strongly acid; gradual wavy boundary.

A'22—65 to 101 inches; white (10YR 8/2) fine sand; single grained; slightly hard, very friable, nonsticky; medium acid; gradual wavy boundary.

B'2h—101 to 120 inches; black (5YR 2/1) and dark reddish brown (5YR 2/2) fine sand; single grained; slightly hard, very friable; nonsticky; very strongly acid.

Solum thickness ranges from 90 to 120 inches. The soil is very strongly acid to slightly acid throughout.

The A horizon is 5 to 8 inches thick. It has hue of 10YR, value of 3 or 4, and chroma of 1 or 2.

The B2 horizon is 40 to 60 inches thick. It has hue of 10YR, value of 6 or 7, and chroma of 4 or 6. Few to common, fine or medium, brown and yellow mottles are in the lower part of the B2 horizon in some pedons.

The A'2 horizon is 20 to 60 inches thick. It has hue of 10YR or 2.5Y, value of 7 and 8, and chroma of 2. Few to common, medium yellow mottles are throughout this horizon in some pedons.

The B'2h horizon is at a depth of more than 80 inches. It has hue of 5YR, value of 2 or 3, and chroma of 1 and 2.

Capers series

The Capers series consists of deep, very poorly drained, very slowly permeable soils that formed in thick clayey marine sediment. These level soils are in narrow tidal marshes that interfinger the mainland, and in narrow floodways of tidal inland creeks on the Silver Bluff Shoreline Complex. Capers soils are flooded by spring tides; in some places they are flooded by daily tides. Slope is less than 1 percent.

Capers soils are closely associated geographically with Bohicket, Duckston, and Fripp soils. Bohicket soils are slightly lower and have an *n* value of 1.0 or more; in addition, Bohicket soils are flooded by seawater twice each day. Poorly drained Duckston soils and excessively drained Fripp soils are sandy throughout. These soils are flooded less often by the tide. Fripp soils are on dunes.

Typical pedon of Capers silty clay in an area of Bohicket-Capers association, in level tidal flat adjoining the mainland, 100 feet south of Georgia Highway 32, 75 feet south of Buffalo Creek; Glynn County:

A1—0 to 8 inches; very dark gray (10YR 3/1) silty clay; massive; sticky; if squeezed in hand, soil flows with some difficulty between the fingers and some soil remains in hand (*n* value 0.7); sulphide gas odor apparent; many matted, medium and fine, live and dead grass roots; few shells on surface; neutral; gradual wavy boundary.

C1g—8 to 30 inches; very dark gray (N 3/0) clay; massive; sticky; if squeezed in hand, soil flows with some difficulty between the fingers and some soil remains in hand (*n* value 0.7); many fine grass roots; neutral; gradual wavy boundary.

C2g—30 to 42 inches; dark gray (5Y 4/1) clay; massive; very sticky; *n* value 0.7 or less; common fine grass roots; mildly alkaline; gradual wavy boundary.

C3g—42 to 60 inches; greenish gray (5GY 5/1) clay; massive; very sticky; *n* value 0.7 or less; few fine grass roots; mildly alkaline.

Capers soils are neutral or mildly alkaline and have very high salinity. The *n* value of the soil within the 10- to 40-inch control section is less than 1.0.

The A horizon is more than 6 inches thick in 75 percent of any pedon, and ranges to 14 inches thick. It has hue of 10YR, value of 3 or 4, and chroma of 1.

The Cg horizon has hue of 10YR, 5Y, N, and 5GY; value of 3 to 5; and chroma of 0 or 1. It is silty clay or clay. The clay content of the 10- to 40-inch control section is 35 to 70 percent. Some pedons are sandy clay loam below a depth of about 40 inches.

Duckston series

The Duckston series consists of deep, poorly drained, very rapidly permeable soils that formed in thick sandy sediment. These nearly level to gently sloping soils are adjacent to beaches and waterways along the Atlantic coast. They are in shallow depressions between dunes and are on flats between the dunes and marshes. Duckston soils are frequently flooded by seawater. Slope is 0 to 2 percent.

Duckston soils are closely associated geographically with Bohicket, Capers, Fripp, and Mandarin soils. Very poorly drained Bohicket and Capers soils have a higher content of clay throughout and are subject to daily tidal flooding. Excessively drained Fripp soils and somewhat poorly drained Mandarin soils are on higher landscapes; in addition, Mandarin soils have a double spodic horizon.

Typical pedon of Duckston sand in an area of Fripp-Duckston complex, 0 to 20 percent slopes, in woodland area 400 feet east of comfort station and 400 feet west of paved road at southern tip of Jekyll Island; Glynn County:

A11—0 to 7 inches; grayish brown (10YR 5/2) sand; single grained; loose; many fine and medium roots; medium acid; clear wavy boundary.

A1b—7 to 17 inches; light brownish gray (2.5Y 6/2) sand; few fine faint pale yellow mottles or stains; single grained; loose; many fine roots; medium acid; clear wavy boundary.

C1g—17 to 35 inches; light gray (2.5Y 7/2) sand; common medium distinct yellowish brown (10YR 5/6) bodies with sand grains coated; few thin bands of gray (10YR 5/1); single grained; loose; few fine and medium roots; common dark minerals; neutral; gradual wavy boundary.

C2g—35 to 55 inches; light gray (2.5Y 7/2) sand; single grained; loose; uncoated; common dark and few pink mineral grains; neutral; gradual wavy boundary.

C3g—55 to 80 inches; greenish gray (5GY 6/1) sand; single grained; loose; uncoated; many dark and whitish mineral grains; mildly alkaline.

Thickness of the sand is 80 inches or more. Reaction ranges from medium acid to mildly alkaline throughout. Few to many dark, white, and pink minerals and a few shells are commonly in the soil. The A horizon is 9 to 17 inches thick. It has hue of 10YR, 2.5Y, or 5Y; value of 4 to 6; and chroma of 1 or 2.

The Cg horizon is 80 inches or more thick. It has hue of 2.5Y, 5Y, or 5GY; value of 5 to 7; and chroma of 1 or 2.

Fripp series

The Fripp series consists of deep, excessively drained, rapidly permeable soils that formed in thick sandy sediment. These undulating and rolling soils are on dunes and are adjacent to beaches and waterways along the Atlantic coast. Fripp soils are rarely flooded by seawater. Slope ranges from 2 to 20 percent.

Fripp soils are closely associated geographically with Bohicket, Capers, Duckston, and Mandarin soils. Very poorly drained Bohicket and Capers soils have a higher content of clay throughout and are subject to daily tidal flooding. Poorly drained Duckston soils are on lower flats. Somewhat poorly drained Mandarin soils have a double spodic horizon.

Typical pedon of Fripp fine sand in an area of Fripp-Duckston complex, 0 to 20 percent slopes, in brushy area 800 feet south of Holiday Inn and 300 feet west of paved road on the southern part of Jekyll Island; Glynn County:

A1—0 to 6 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; common fine and medium roots; about 15 percent of the grains are black; slightly acid; clear wavy boundary.

C1—6 to 35 inches; pale brown (10YR 6/3) fine sand; single grained; loose; thinly banded (1/2 inch-2 inches); few fine and medium roots; about 15 percent of the grains are black; slightly acid; gradual wavy boundary.

C2—35 to 55 inches; pale brown (10YR 6/3) fine sand; single grained; loose; thinly banded; about 5 percent of the grains are black; few medium pockets of light gray (10YR 7/1) clean sand grains; slightly acid; gradual wavy boundary.

C3—55 to 80 inches; white (10YR 8/2) fine sand; single grained; loose; about 15 percent of the grains are black; slightly acid.

Thickness of the sand is 80 inches or more. Reaction ranges from medium acid to mildly alkaline throughout. Few to many dark minerals and a few shell fragments are commonly in the soil.

The A1 horizon is commonly 6 inches thick but ranges from 4 to 10 inches in thickness. It has hue of 10YR and 5Y, value of 4 to 6, and chroma of 1 or 2.

The C horizon is 80 inches or more thick. The C1 horizon and C2 horizon have hue of 2.5Y or 10YR, value of 5 to 8, and chroma of 3 or 4. The C3 horizon has hue of 10YR or 2.5Y, value of 7 or 8, and chroma of 1 to 3.

Kingsland series

The Kingsland series consists of deep, very poorly drained, rapidly permeable, organic soils that formed in thick deposits of woodland hydrothytic plant remains. These level and depressional soils are on flood plains that are subject to daily flooding because of the tides. Slope is less than 1 percent.

Kingsland soils are closely associated geographically with Brookman and Meggett soils. Brookman and Meggett soils are mineral soils and are on slightly higher flats and in depressions.

Typical pedon of Kingsland mucky peat in hardwood forest about 7.0 miles west of Kingsland on Georgia Highway 40, 1.25 miles south of Georgia Highway 40 and 600 feet north of St. Marys River; Camden County:

Oe1—0 to 10 inches; dark reddish brown (5YR 2/2), unrubbed and rubbed, hemic material; about 40 percent fiber unrubbed, 22 percent fiber rubbed; fibers are 1 to 3 mm in size, about 5 percent are 3 to 5 mm; about 5 to 10 percent mineral matter; massive; slightly acid; gradual wavy boundary.

Oe2—10 to 20 inches; black (10YR 2/1), unrubbed and rubbed, hemic material; fiber content is about 40 percent unrubbed, 24 percent rubbed; fiber size 1 to 3 mm; about 5 to 10 percent mineral material; massive; slightly acid; gradual wavy boundary.

Oe3—20 to 65 inches; very dark brown (10YR 2/2), unrubbed and rubbed, hemic material; about 70 percent fiber unrubbed, 40 percent rubbed; fiber size 1 to 3 mm, about 5 percent are 3 to 6 mm; 5 percent mineral material; slightly acid.

Organic material thickness ranges from 51 to 90 inches. Reaction ranges from very strongly acid to slightly acid throughout.

The Oe1 tier is 8 to 20 inches thick. It has hue of 5YR or 10YR, value of 1 or 2, and chroma of 0 to 2. This tier is dominantly hemic material but ranges to include sapric material.

The Oe2 tier is 8 to 20 inches thick. It has hue of 5YR or 10YR, value of 1 to 3, and chroma of 0 to 2.

The Oe3 tier is 40 to 60 inches thick. It has hue of 10YR, value of 1 to 3, and chroma of 1 or 2.

Mandarin series

The Mandarin series consists of deep, somewhat poorly drained, moderately permeable soils that formed in thick sandy marine sediment. These nearly level soils are on slight ridges and broad flats of the Talbot and Princess Ann Shoreline Complexes. The water table is 18 to 40 inches below the surface during summer and fall. Slope ranges from 0 to 2 percent.

Mandarin soils are closely associated geographically with Cainhoy, Pottsburg, and Rutlege soils. Cainhoy soils have a spodic horizon at a depth of 100 inches or more and are somewhat excessively drained. Pottsburg soils have a spodic horizon at a depth of 50 inches or more. Rutlege soils do not have a spodic horizon and are very poorly drained.

Typical pedon of Mandarin fine sand in woodland plantation 6.0 miles east of Angulla community, 3.0 miles north of the junction of U.S. Highway 341 and Georgia Highway 303, 50 feet east of Crispen Avenue; Glynn County:

A1—0 to 3 inches; very dark gray (10YR 3/1) fine sand; weak fine granular structure; loose, very friable, nonsticky; common fine and medium roots; very strongly acid; clear wavy boundary.

A21—3 to 7 inches; gray (10YR 6/1) fine sand; single grained; loose, very friable, nonsticky; common fine and medium roots; very strongly acid; clear wavy boundary.

A22—7 to 19 inches; light gray (10YR 7/2) fine sand; single grained; loose, very friable, nonsticky; strongly acid; abrupt wavy boundary.

B21h—19 to 23 inches; black (10YR 2/1) fine sand; weak fine subangular blocky structure; slightly hard, friable, sticky; weakly cemented; sand grains coated with organic matter; strongly acid; gradual wavy boundary.

B22h—23 to 30 inches; very dark brown (10YR 2/2) fine sand; weak fine subangular blocky structure; slightly hard, friable, sticky; weakly cemented; sand grains coated with organic matter; strongly acid; gradual wavy boundary.

B23h—30 to 34 inches; dark brown (10YR 3/3) fine sand; weak fine subangular blocky structure; slightly hard, friable, sticky; weakly cemented; sand grains coated with organic matter; strongly acid; gradual wavy boundary.

B3—34 to 36 inches; yellowish brown (10YR 5/4) fine sand; single grained; loose, very friable, nonsticky; medium acid; gradual smooth boundary.

A'21—36 to 46 inches; light gray (10YR 7/1) fine sand; common medium distinct yellowish brown (10YR 5/8) mottles; single grained; loose, very friable, nonsticky; medium acid; gradual wavy boundary.

A'22—46 to 55 inches; white (10YR 8/2) fine sand; single grained; loose, very friable, nonsticky; medium acid; gradual wavy boundary.

A'23—55 to 62 inches; grayish brown (10YR 5/2) fine sand; single grained; loose, very friable, nonsticky; medium acid; gradual wavy boundary.

B'2h—62 to 80 inches; black (10YR 2/1) fine sand; weak fine subangular blocky structure; slightly hard, friable, sticky; weakly cemented; sand grains coated with organic matter; medium acid.

Solum thickness is 80 inches or more. Reaction ranges from extremely acid to medium acid in the A horizon and Bh horizon and from medium acid to neutral in the B3 horizon, A'2 horizon, and B'h horizon. All horizons below the A1 horizon range from fine sand to sand.

The A1 horizon is 3 to 6 inches thick. It has hue of 10YR, value of 2 to 5, and chroma of 1.

The A2 horizon is 11 to 17 inches thick. It has hue of 10YR, value of 5 to 8, and chroma of 1 or 2.

The Bh horizon is 12 to 20 inches thick. It has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 to 3.

The B3 horizon is 2 to 6 inches thick. It has hue of 10YR, value of 4 or 5, and chroma of 2 to 4.

The A'2 horizon is 20 to 38 inches thick. It has hue of 10YR, value of 5 to 8, and chroma of 1 or 2. The A'2 horizon has yellowish brown mottles in some pedons.

The B'h horizon has hue of 7.5YR and 10YR, value of 2 or 3, and chroma of 1 or 2.

Meggett series

The Meggett series consists of deep, poorly drained, slowly permeable soils that formed in clayey marine sediment and in alluvial deposits. These nearly level soils are on broad, low terraces and flood plains of the Atlantic Coast Flatwoods. The water table is within 12 inches of the surface from fall to spring. Slope ranges from 0 to 2 percent.

Meggett soils are closely associated geographically with Bladen, Brookman, Pelham, and Rains soils. Bladen soils are strongly acid to extremely acid in the argillic horizon and have a base saturation that is less than 35 percent. Brookman soils have an umbric epipedon and a base saturation that is more than 35 percent. Pelham soils are arenic. Rains soils do not have an abrupt textural change between the A horizon and B horizon and are fine-loamy within the control section.

Typical pedon of Meggett fine sandy loam in an area of Meggett fine sandy loam, 0 to 2 percent, in wooded plantation 1.0 mile east of Jerusalem on Georgia Highway 252, 1.0 mile north on private road, 600 feet west of road; Camden County:

A1—0 to 5 inches; dark gray (10YR 4/1) fine sandy loam; weak fine granular structure; very friable, slightly sticky; many fine and medium roots; medium acid; clear wavy boundary.

A2—5 to 8 inches; gray (10YR 5/1) fine sandy loam; common medium faint yellowish brown (10YR 5/6) mottles; weak fine granular structure; very friable, slightly sticky; many fine and medium roots; medium acid; abrupt wavy boundary.

B21tg—8 to 16 inches; mottled gray (10YR 5/1) and strong brown (7.5YR 5/8) sandy clay; surfaces of peds are greenish gray (5G 5/1, 6/1); moderate medium angular blocky structure; firm, sticky; few fine roots; few thick patchy clay films along vertical faces of peds; slightly acid; gradual wavy boundary.

B22tg—16 to 43 inches; mottled light gray (10YR 6/1) and strong brown (7.5YR 5/8) clay; surfaces of peds are greenish gray (5G 6/1); strong medium angular blocky structure; very firm, very sticky; few fine roots; thick continuous clay film on vertical faces of peds; common fragments of shell; few pockets of sand; neutral; gradual wavy boundary.

B23tg—43 to 52 inches; light olive gray (5Y 6/2) clay; common medium distinct yellowish brown (10YR 5/6) and gray (10YR 5/1) mottles; moderate medium angular blocky structure; very firm, very sticky; patchy clay film along vertical faces of peds; few pockets of sand; neutral; gradual wavy boundary.

B3g—52 to 65 inches; gray (5Y 6/1) sandy clay; common medium distinct yellowish brown (10YR 5/8) mottles; weak fine subangular blocky structure; firm, very sticky; few pockets of sandy clay loam; thin patchy clay film along vertical faces of peds; few fine concretions of calcium carbonate; neutral.

Solum thickness ranges from 40 to 72 inches. The A horizon is slightly acid or medium acid. The B horizon is slightly acid to moderately alkaline.

The A horizon is 3 to 13 inches thick. It has hue of 10YR and 5Y, value of 2 to 6, and chroma of 1 or 2.

The Btg horizon is 27 to 52 inches thick. It is mottled in hue of 7.5YR, 10YR, and 2.5Y; value of 4 to 6; and chroma of 1 to 8. Commonly, the soil has hue of 10YR and 5Y, value of 4 to 7, and chroma of 1 or 2 with few to many, brown, red, and gray mottles. This horizon is clay or sandy clay. Fine concretions of calcium carbonate or shell fragments are few or common in some pedons.

The B3 horizon is 10 to 15 inches thick. It has hue of 10YR and 5Y, value of 4 to 7, and chroma of 1 or 2. It is sandy clay or sandy clay loam. Fine concretions of calcium carbonate or shell fragments are few or common in some pedons.

Olustee series

The Olustee series consists of deep, poorly drained soils that are moderately permeable except for the rapidly permeable Ap horizon and A'2 horizon. These soils formed in sandy and loamy marine sediment. These nearly level soils are on broad terraces of the Atlantic Coast Flatwoods. The water table is within 12 inches of the surface during the summer. Slope ranges from 0 to 2 percent.

Olustee soils are closely associated geographically with Albany, Pelham, and Sapelo soils. Albany and Pelham soils do not have a spodic horizon; in addition, Albany soils are on slightly higher ridges and Pelham soils are on slightly lower flats and in depressions and drainageways. Sapelo soils have a B't horizon below a depth of 40 inches.

Typical pedon of Olustee sand in woodland plantation 2,000 feet south of Seals Road, 500 feet north of John Frank Road, 50 feet south of Higginbothan Road; Camden County:

Ap—0 to 5 inches; black (10YR 2/1) sand; few fine distinct light brownish gray mottles; weak fine granular structure; soft, very friable, nonsticky; common fine and medium roots; very strongly acid; gradual wavy boundary.

B2h—5 to 11 inches; very dark grayish brown (10YR 3/2) sand; weak fine granular structure; slightly hard, friable, sticky; weakly cemented; few fine and medium roots; strongly acid; gradual wavy boundary.

B3 and Bh—11 to 19 inches; dark grayish brown (10YR 4/2) sand; few fine faint grayish brown mottles and few dark brown (7.5YR 3/2) weakly cemented bodies; weak fine granular structure; soft, friable, nonsticky; strongly acid; gradual wavy boundary.

A'21—19 to 30 inches; light brownish gray (10YR 6/2) sand; common medium distinct brownish yellow (10YR 5/8) and grayish brown (10YR 5/2) mottles;

single grained; loose, very friable, nonsticky; very strongly acid; gradual wavy boundary.

A'22—30 to 35 inches; light gray (10YR 7/2) sand; few fine distinct yellowish brown mottles and few fine faint brown mottles; single grained; loose, very friable, nonsticky; very strongly acid; gradual wavy boundary.

B'21tg—35 to 60 inches; light gray (10YR 7/2) sandy clay loam; common medium distinct yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; hard, friable, slightly sticky; sand grains are bridged with clay; very strongly acid; gradual wavy boundary.

B'22tg—60 to 80 inches; light gray (10YR 7/2) sandy clay loam; common medium distinct yellowish brown (10YR 5/8) mottles, and few fine faint gray mottles; weak medium subangular blocky structure; hard, firm, slightly sticky; sand grains are bridged with clay; very strongly acid.

Solum thickness ranges from 70 to 80 inches or more. Reaction is very strongly acid or strongly acid throughout. Depth to the Bh horizon is 4 to 9 inches, and depth of the B'2t horizon is 35 to 40 inches.

The Ap or A1 horizon is commonly 5 inches thick but ranges to 9 inches. The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1.

The B2h horizon is 4 to 6 inches thick. It has hue of 7.5YR and 10YR, value of 2 or 3, and chroma of 1 or 2. The Bh and B3 horizon has hue of 10YR and 7.5YR, value of 3 to 5, and chroma of 2 to 4. The B2h horizon and the Bh and B3 horizon are fine sand or sand.

The A'2 horizon is 10 to 20 inches thick. It has hue of 10YR and 2.5Y, value of 5 to 7, and chroma of 1 or 2. It is fine sand or sand.

The B'2tg horizon is 30 inches thick or more. It has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. It has common fine and medium yellow and gray mottles. It is sandy clay loam or sandy loam.

Pelham series

The Pelham series consists of deep, poorly drained, moderately permeable soils that formed in sandy and loamy sediment. These nearly level soils are on broad flats and in shallow depressions and drainageways of the Atlantic Coast Flatwoods. The water table is commonly 6 to 18 inches below the surface during winter and early in spring. Slope ranges from 0 to 2 percent.

Pelham soils are closely associated geographically with Albany, Olustee, Rains, and Sapelo soils. Albany soils are grossarenic and somewhat poorly drained, and they are on higher ridges. Olustee and Sapelo soils have a spodic horizon; in addition, Olustee soils have a Btg horizon within 40 inches of the surface. Rains soils have a fine-loamy control section.

Typical pedon of Pelham loamy sand in woodland plantation 0.75 mile north of junction of Southern railroad track and Pennick Road, 0.75 mile east of U.S. Highway 341, 50 feet east of Pennick Road; Glynn County:

A1—0 to 7 inches; very dark gray (10YR 3/1) loamy sand; weak fine granular structure; soft, very friable; nonsticky; many fine roots; very strongly acid; clear wavy boundary.

A2—7 to 25 inches; grayish brown (10YR 5/2) loamy sand; common medium yellowish brown mottles; weak fine granular structure; soft, very friable, nonsticky; very strongly acid; clear wavy boundary.

B1—25 to 30 inches; gray (10YR 5/1) sandy loam; common medium distinct brownish yellow (10YR 6/6) and reddish yellow (7.5YR 6/8) mottles, and few fine prominent yellowish red mottles; weak fine subangular blocky structure; slightly hard, friable, slightly sticky; very strongly acid; gradual wavy boundary.

B21tg—30 to 40 inches; gray (10YR 6/1) sandy clay loam; common medium distinct reddish yellow (7.5YR 6/8) mottles; weak fine subangular blocky structure; hard, friable, slightly sticky; few thin patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

B22tg—40 to 75 inches; gray (10YR 6/1) sandy clay; common medium distinct reddish yellow (7.5YR 6/8) and greenish gray (5GY 6/1) mottles, and few fine prominent yellowish red mottles; weak medium subangular blocky structure; hard, firm, sticky; few thin patchy clay films on faces of peds; very strongly acid.

Solum thickness ranges from 60 to 90 inches. Reaction is strongly acid or very strongly acid throughout.

The A1 horizon is 4 to 8 inches thick. It has hue of 10YR, value of 3 or 4, and chroma of 0 or 1. The A2 horizon is 16 to 22 inches thick. It has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. It is loamy sand or sand.

The B1 horizon, if present, is 3 to 6 inches thick. It has hue of 10YR and 5Y, value of 5 to 7, and chroma of 1. In some pedons, mottles are few or common and predominantly yellow. This horizon is sandy clay loam or sandy loam.

The B2t horizon is 45 inches or more thick. It has hue of 10YR and 5Y, value of 5 or 6, and chroma of 1 or 2. In some pedons mottles are few or common yellow, red, and gray. This horizon is sandy clay loam in the control section and ranges to sandy clay in the lower part of the subsoil.

Pottsburg series

The Pottsburg series consists of somewhat poorly drained soils that are rapidly permeable in the thick sandy layers and moderately permeable in the organic hardpan. These soils formed in thick sandy marine deposits. These nearly level soils are on terraces of the Atlantic Coast Flatwoods. They are slightly higher than the adjacent soils. The water table is 12 to 40 inches below the surface from summer to winter. Slope ranges from 0 to 2 percent.

Pottsburg soils are closely associated geographically with Cainhoy, Mandarin, Rutlege, and Sapelo soils. Somewhat excessively drained Cainhoy soils are on higher ridges. Mandarin soils have a Bh horizon at a depth of less than 30 inches and a B'h horizon at a depth of less than 70 inches. Rutlege soils are in shallow depressions. In addition, Rutlege soils have an umbric epipedon and do not have a Bh horizon. Poorly drained Sapelo soils have a Bh horizon above a depth of 30 inches.

Typical pedon of Pottsburg sand in forest 1.0 mile north of Georgia Highway 252 on dirt road, 2.0 miles west of Jerusalem, 50 feet east of road; Camden County:

A1—0 to 4 inches; gray (10YR 5/1) sand; weak fine granular structure; very friable; many very fine and fine roots; very strongly acid; gradual smooth boundary.

A21—4 to 10 inches; light gray (10YR 7/2) sand; weak fine granular structure; very friable; many fine roots; very strongly acid; gradual wavy boundary.

A22—10 to 35 inches; light gray (10YR 7/2) sand; common medium faint brownish yellow (10YR 6/6), brown (10YR 4/3), and light gray (10YR 7/1) mottles; single grained; very friable; strongly acid; gradual wavy boundary.

A23—35 to 63 inches; white (10YR 8/1) sand; common medium faint brownish yellow (10YR 6/6) and dark grayish brown (10YR 4/2) mottles; single grained; loose; strongly acid; gradual wavy boundary.

B2h—63 to 80 inches; dark brown (7.5YR 3/2) sand; weak fine subangular blocky structure; friable; very weakly cemented; sand grains continuously coated with organic matter; strongly acid.

Solum thickness ranges from 80 to 100 inches. Reaction ranges from very strongly acid to slightly acid in the A horizon, and very strongly acid to medium acid in the Bh horizon. All horizons below the surface layer are fine sand or sand.

The A1 or Ap horizon is 4 to 8 inches thick. These horizons have hue of 10YR, value of 5, and chroma of 1 or 2.

The A21 horizon is 6 to 18 inches thick. It has hue of 10YR, value of 5 through 7, and chroma of 2 or 3.

The A22 horizon is 10 to 25 inches thick. It has hue of 10YR and 2.5Y, value of 5 through 7, and chroma of 1 or 2.

The A23 horizon is 20 to 28 inches thick. It has hue of 10YR and 2.5Y, value of 6 to 8, and chroma of 1 or 2.

The Bh horizon has hue of 5YR through 10YR, value of 3, and chroma of 2.

Rains series

The Rains series consists of deep, poorly drained, moderately permeable soils that formed in thick loamy fluvial and marine sediment. These nearly level soils are on broad flats and in shallow depressions and drainageways of the Atlantic Coast Flatwoods. The water table is within 12 inches of the surface from late fall until spring. Slopes are dominantly less than 1 percent, but range to 2 percent near drainageways.

Rains soils are closely associated geographically with Bladen, Brookman, and Pelham soils. Bladen soils are commonly slightly higher and have a clayey control section. Brookman soils are in depressions, have an umbric epipedon, and are clayey in the B horizon. Pelham soils are arenic.

Typical pedon of Rains fine sandy loam in wooded area 0.8 mile west-southwest of U.S. Highway 82 and Emanuel Church on dirt road, 20 feet south of road; Glynn County:

A1—0 to 6 inches; very dark gray (10YR 3/1) fine sandy loam; weak fine granular structure; loose; many fine roots; pockets of clean sand and organic matter; brown stains around root channels; very strongly acid; clear wavy boundary.

A2—6 to 18 inches; dark gray (10YR 4/1) sandy loam; common fine distinct yellowish brown mottles; weak medium granular structure; very friable; common fine roots; streaks and pockets of clean sand; very strongly acid; gradual wavy boundary.

B1g—18 to 28 inches; gray (10YR 5/1) sandy loam; many medium distinct yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; friable; pockets of sandy clay loam; very strongly acid; clear wavy boundary.

B21tg—28 to 36 inches; gray (N 6/0) sandy clay loam; common medium prominent strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; firm; many pockets of sandy clay and sandy loam; very strongly acid; gradual wavy boundary.

B22tg—36 to 50 inches; gray (N 6/0) sandy clay; common medium prominent yellowish red (5YR 5/8) and strong brown (7.5YR 5/8) mottles; in pockets, making up 40 percent of horizon, gray (5Y 5/1) sandy clay loam; common medium prominent yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; firm in sandy clay part, friable in sandy clay loam pockets; few patchy clay films on faces of peds; strongly acid; gradual wavy boundary.

B23tg—50 to 65 inches; grayish brown (2.5Y 5/2) sandy clay; many medium distinct yellow (2.5Y 7/6) mottles and common medium prominent yellowish red (5YR 4/8) mottles; weak medium subangular blocky structure; firm; pockets of grayish brown (5Y 5/2) sandy loam; few patchy clay films on faces of peds; strongly acid.

Solum thickness ranges from 60 to 80 inches. Reaction is very strongly acid or strongly acid except where the surface layer has been limed.

The A1 horizon is 4 to 9 inches thick. It has hue of 10YR, value of 3 to 4, and chroma of 1 or 2.

The A2 horizon is 9 to 12 inches thick. It has hue of 10YR and 2.5Y, value of 4 to 6, and chroma of 1 or 2. It is sandy loam, fine sandy loam, or loamy sand. Few or common, brown and yellow mottles are throughout.

The B1g horizon, if present, is 4 to 10 inches thick. It has hue of 10YR and 2.5Y, value of 4 to 6, and chroma of 1 or 2. Few or common, brown and yellow mottles are throughout. It is sandy loam or fine sandy loam.

The Btg horizon is more than 40 inches thick. It has hue of 10YR, 2.5Y, or 5Y; value of 5 to 7; and chroma of 0 to 2. It is sandy clay loam and ranges to sandy clay below depths of 40 inches in some pedons. The average clay content in the upper 20 inches of the B2tg horizon ranges from 20 to 34 percent. The clay content of the lower B2tg horizon ranges from 25 to 50 percent. Strong brown, yellowish red, yellowish brown, and yellow mottles are throughout.

Rutlege series

The Rutlege series consists of deep, very poorly drained, rapidly permeable soils that formed in sandy marine sediment. These nearly level soils are in drainageways and shallow depressions on the Princess Ann and Talbot Shoreline Complexes. They are saturated in winter and spring, and ponding is common during this period. Slope is dominantly less than 1 percent, but ranges to 2 percent.

Rutlege soils are closely associated geographically with Mandarin and Pottsburg soils. The associated soils have a spodic horizon, are somewhat poorly drained, and do not have an umbric epipedon. Mandarin soils are on adjacent low ridges and broad flats. Pottsburg soils are on higher ridges.

Typical pedon of Rutlege fine sand in a shallow depression 0.5 mile south of the Brantley County line on State Highway 259, 300 feet east of highway; Camden County:

O1—2 inches to 0; sphagnum moss.

A11—0 to 12 inches; black (N 2/0) fine sand; weak fine granular structure; very friable; many fine and medium roots; about 15 percent organic matter content; extremely acid; abrupt smooth boundary.

A12—12 to 15 inches; very dark gray (10YR 3/1) fine sand; single grained; loose; few fine and medium roots; extremely acid; abrupt wavy boundary.

C1g—15 to 26 inches; light gray (10YR 7/1) fine sand; common medium faint light brownish gray (10YR 6/2) mottles; single grained; loose; very strongly acid; gradual wavy boundary.

C2g—26 to 52 inches; light brownish gray (10YR 6/2) fine sand; single grained; loose; compact in places; very strongly acid; gradual wavy boundary.

C3g—52 to 70 inches; grayish brown (10YR 5/2) fine sand; common medium faint very dark grayish brown (10YR 3/2) mottles; single grained; loose; compact in places; very strongly acid.

Thickness of the sand is 80 inches or more. Reaction is extremely acid or very strongly acid throughout.

The A1 horizon is more than 10 inches thick in 75 percent of any pedon but ranges to 20 inches thick. It has hue of 10YR and 2.5Y, value of 2 or 3, and chroma of 0 to 2.

The Cg horizon is 40 to 55 inches or more thick. It has hue of 10YR, value of 4 to 7, and chroma of 1 or 2. Mottles are few or common, gray and brown in some pedons.

Sapelo series

The Sapelo series consists of deep, poorly drained, moderately permeable soils that formed in sandy and loamy marine sediment. These nearly level soils are in the transition zone of the Pamlico and Princess Ann Shoreline Complexes. The water table is 18 to 30 inches below the surface from late fall until spring. Slope ranges from 0 to 2 percent.

Sapelo soils are closely associated geographically with Albany, Bladen, Brookman, Olustee, and Pelham soils. Somewhat poorly drained Albany soils, poorly drained Bladen and Pelham soils, and very poorly drained Brookman soils do not have a spodic horizon. Albany soils are on slightly higher ridges. Bladen and Brookman soils have a clayey control section. In addition, Brookman soils are in depressions and have an umbric epipedon. Olustee soils do not have an A2 horizon; they have a B't horizon within a depth of 40 inches. Pelham soils are arenic.

Typical pedon of Sapelo fine sand in woodland plantation 1.5 miles south of Spring Bluff, 550 feet north of Church of God by Faith, 200 feet north of Interstate 95; Camden County:

A1—0 to 4 inches; black (N 2/0) fine sand; weak fine granular structure; very friable; many fine shrub roots; many clean sand grains that give a salt and pepper appearance; very strongly acid; clear smooth boundary.

A2—4 to 17 inches; light gray (10YR 7/1) fine sand; few medium distinct vertical dark gray (10YR 4/1) streaks; single grained; loose; common fine roots; very strongly acid; abrupt wavy boundary.

B21h—17 to 19 inches; very dark brown (10YR 2/2) fine sand; weak fine granular structure; weakly cemented; common fine roots; many sand grains coated with organic matter; few clean sand grains; very strongly acid; clear wavy boundary.

B22h—19 to 22 inches; dark brown (7.5YR 4/4) fine sand; common medium distinct dark reddish brown (5YR 2/2) mottles; weak fine granular structure; weakly cemented; few fine roots; sand grains coated with organic matter; very strongly acid; clear wavy boundary.

Bh&B3—22 to 25 inches; dark brown (10YR 4/3) fine sand; common medium faint dark brown (10YR 3/3) and yellowish brown (10YR 5/4) mottles; weak fine granular structure; friable with common weakly cemented bodies; few fine roots; many sand grains coated with organic matter; few clean sand grains; very strongly acid; clear wavy boundary.

A'2—25 to 49 inches; pale yellow (2.5Y 8/4) fine sand; common medium prominent strong brown (7.5YR 5/6) mottles; common 10 to 50 mm weakly cemented pockets that are mottled light yellowish brown (2.5Y 6/4); single grained; loose; common clean sand grains; very strongly acid; clear wavy boundary.

B'2tg—49 to 84 inches; light gray (5Y 7/1) sandy clay loam; common medium prominent yellowish brown (10YR 5/8) mottles and a few fine prominent red mottles; moderate medium subangular blocky structure; firm; patchy clay films on faces of peds; very strongly acid.

Solum thickness ranges from 70 to 90 inches. Reaction ranges from extremely acid to strongly acid throughout. Depth to the Bh horizon is 10 to 25 inches, and depth to the B'2tg horizon is 40 to 70 inches.

The A1 horizon is less than 8 inches thick. It has hue of 10YR, value of 2 to 4, and chroma of 1, or it is neutral with value of 2 or 4.

The A2 horizon is 7 to 16 inches thick. It has hue of 10YR and 2.5Y, value of 5 to 8, and chroma of 2 or less.

The Bh horizon is 5 to 12 inches thick. It has hue of 5YR, 7.5YR, or 10YR; value of 2 to 4; and chroma of 1 to 4. The Bh&B3 horizon has hue of 10YR; value of 3 to 7; and chroma of 3, 4, or 6. These horizons are fine sand or sand.

The A'2 horizon is 20 to 31 inches thick. It has hue of 2.5Y and 10YR, value of 6 to 8, and chroma of 2 to 4. This horizon has red, brown, and yellow mottles in some pedons. It is fine sand or sand.

The B'2tg horizon is 10 to 25 inches or more thick. It has hue of 10YR and 5Y, value of 6 to 8, and chroma of 1 or 2. This horizon has few or common, red and brown mottles.

Satilla series

The Satilla series consists of deep, very poorly drained soils that have moderately rapid permeability. These soils formed in loamy marine and fluvial sediment deposited over organic material. Level Satilla soils are on broad flood plains of rivers that are influenced by the tide. These soils are saturated in winter and spring. Slope is less than 1 percent.

Satilla soils are closely associated geographically with Bohicket, Brookman, and Meggett soils. The associated soils do not have buried organic layers. In addition, Brookman and poorly drained Meggett soils have a clayey argillic horizon. Bohicket soils have high salinity and are continuously saturated with seawater.

Typical pedon of Satilla loam in cultivated field, 3.3 miles east of Jerusalem, 0.5 mile north of Satilla River, 0.5 mile northwest of barn, 1,000 feet east of dike on the Maryfield Plantation; Camden County:

Ap—0 to 5 inches; very dark gray (10YR 3/1) loam; moderate fine and medium granular structure; slightly hard, friable, sticky; many very fine roots; strongly acid; abrupt wavy boundary.

A12—5 to 10 inches; dark gray (5Y 4/1) sandy clay loam; few medium distinct grayish brown (2.5Y 5/2) mottles; weak fine angular blocky structure; slightly hard, friable, sticky; many very fine roots; many fine pores; 5 percent by volume partly decomposed bark, leaves, and tree trunks; the lowest inch is partly decomposed organic matter; strongly acid; abrupt wavy boundary.

A13—10 to 24 inches; very dark gray (10YR 3/1) sandy clay loam; common medium distinct dark grayish brown (2.5Y 4/2) mottles; weak fine angular blocky structure; 15 percent by volume partly decomposed organic matter; soft, friable, slightly sticky; many fine pores; the lower part consists of 3-inch mineral layers separated by 1/2-inch layers of organic matter; strongly acid; gradual wavy boundary.

IIOa—24 to 65 inches; very dark brown (10YR 2/2), broken faces and rubbed, organic material; about 20 percent fibers, less than 8 percent rubbed; weak medium granular structure; very friable; common medium roots; few medium fragments of charcoal; about 15 percent by volume logs and stumps; strongly acid.

The mineral surface layer ranges from 21 to 38 inches in thickness. The soil is very strongly acid or strongly acid throughout. Soil salinity is very low in some pedons.

The Ap or A11 horizon is less than 8 inches thick. It has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. Organic matter content ranges from 15 to 40 percent.

The A12 horizon is 5 to 12 inches thick. It has hue of 5Y to 10YR, value of 3 to 5, and chroma of 2 or less. This horizon is clay loam, sandy clay loam, or silty clay loam. Mottles are few to common, fine and medium in some pedons. Organic matter content ranges from 5 to 25 percent.

The A13 horizon is 9 to 18 inches thick. It has hue of 10YR or 5YR, value of 3, and chroma of 1 or 2. This horizon is clay loam, silty clay loam, or sandy clay loam. Organic matter content ranges from 5 to 25 percent.

The IIOa horizon has hue of 10YR or 5YR, value of 2 or 3, and chroma of 1 or 2. Stumps, logs, and roots are few to many.

Classification of the soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*6*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. In this system the classification is based on the different soil properties that can be observed in the field or those that can be inferred either from other properties that are observable in the field or from the combined data of soil science and other disciplines. The properties selected for the higher categories are the result of soil genesis or of factors that affect soil genesis. In table 18, the soils of the survey area are classified according to the system. Categories of the system are discussed in the following paragraphs.

ORDER. Ten soil orders are recognized as classes in the system. The properties used to differentiate among orders are those that reflect the kind and degree of dominant soil-forming processes that have taken place. Each order is identified by a word ending in *sol*. An example is Entisol.

SUBORDER. Each order is divided into suborders based primarily on properties that influence soil genesis and are important to plant growth or that are selected to 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 expression of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and a prefix that suggests something about the properties of the soil. An example is Haplaquents (*Hapl*, meaning simple horizons, plus *aquent*, the suborder of Entisols that have an aquic moisture regime).

SUBGROUP. Each great group may be divided into three subgroups: the central (typic) concept of the great groups, which is not necessarily the most extensive subgroup; the intergrades, or transitional forms to other orders, suborders, or great groups; and the extragrades, which have some properties that are representative of the great groups 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 is thought to typify the great group. An example is Typic Haplaquents.

FAMILY. Families are established within a subgroup on the basis of similar physical and chemical properties that affect management. Among the properties considered in horizons of major biological activity below plow depth are particle-size distribution, mineral content, temperature regime, thickness of the soil penetrable by roots, consistence, moisture equivalent, soil slope, and permanent cracks. A family name consists of the name of a subgroup and a series of adjectives. The adjectives are the class names for the soil properties used as family differentiae. An example is fine-loamy, mixed, nonacid, mesic, Typic Haplaquents.

SERIES. The series consists of soils that formed in a particular kind of material and have horizons that, except for texture of the surface soil or of the underlying substratum, are similar in differentiating characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineral and chemical composition.

Formation of the soils

Glenn L. Bramlett, soil correlator, Soil Conservation Service, helped prepare this section.

This section describes the factors of soil formation, relates them to soils in the survey area, and explains the processes of soil formation.

Soil characteristics are determined by the physical and mineral composition of the parent material; the climate under which the parent material accumulated and has existed since accumulation; the plant and animal life on and in the soil; the relief, or lay of the land; and the length of time the forces of soil formation have acted on the soil material. All of these factors influence the present characteristics of every soil, but the significance of each factor varies from one place to another. In one area one factor may dominate soil formation; in another area a different factor may be the most important.

The interrelationship among these five factors is complex, and the effects of any one factor cannot be isolated and completely evaluated. It is convenient to discuss each factor separately, however, and to indicate the probable effects of each.

Parent material

Parent material is the unconsolidated mass in which soil forms. It is largely responsible for the chemical and mineral composition of a soil. The parent material in Camden and Glynn Counties was deposited during the present Holocene and late Pleistocene epochs and consists of fluvial and marine sediments (*3*).

Since rock is not recognized as parent material in the survey area, parent material is related to the various geomorphic surfaces or terraces. The youngest sediments are stream alluvium, and deposits are added each year. Kingsland and Satilla soils are representative of soils formed in these young deposits. The Holocene Terrace is composed of silty and clayey sediments in marshland that is flooded twice each day. Bohicket and Capers soils are representative of soils formed on this terrace. Mandarin and Cainhoy soils formed in sandy deposits on the Princess Ann and Silver Bluff Terraces. The Pamlico Terrace is composed of more clayey deposits than the other terraces in the survey area. Representative soils on the Pamlico Terrace are Bladen and Pelham soils. The oldest and highest sediments are on the Talbot Terrace. Albany and Pottsburg soils are representative of soils that formed in sandy and loamy sediments on the Talbot Terrace.

Plants and animals

The role of plants, animals, and other organisms is significant in soil development. Plant and animal life can increase organic matter and nitrogen, increase or decrease plant nutrients, and change soil structure and porosity.

Plants recycle plant nutrients, accumulate organic matter, and provide food and cover for animal life. They stabilize the surface layer so that soil-forming processes can continue. Vegetation also provides a more stable environment for soil-forming processes by protecting the soils from extremes in temperature.

The soils of Camden and Glynn Counties formed under a succession of plants. This succession is still evident in the smooth cordgrass, black rush, and salt bermudagrass in the marshlands; the big cordgrass and giant cutgrass in brackish water areas; the hardwood trees and cypress in very poorly drained areas; and the pine trees in the moderately well drained and poorly drained areas.

Animals rearrange soil materials by roughening the soil surface, forming and filling channels, and shaping the peds and voids. The soil is mixed by ants, wasps, worms, and spiders that make channels and by crustacea, such as crabs and crayfish, together with turtles and other reptiles that make burrows. Bacteria, fungi, and other micro-organisms hasten decomposition of organic matter and increase the release of minerals for additional plant growth. Humans affect the soil-forming process by tilling for agriculture, removing natural vegetation and establishing different plants, and reducing or increasing the fertility.

The net gains and losses caused by plants and animals in the soil-forming process are important in Camden and Glynn Counties. The fiddler crab and other crustacea continuously burrow and rework the upper horizons of Bohicket and Capers soils. Plant residue provides most of the organic matter for the formation of the umbric epipedon in Brookman and Rutlege soils. Plants recycle the calcium in Meggett soils and provide the stability necessary for the formation of the ochric epipedon.

Climate

The climate of Camden and Glynn Counties is humid, warm, and moist and is thought to be similar to the climate that existed as the soils formed. The relatively high rainfall and warm temperature contribute to rapid soil formation and are the two most important features of the climate that relate to soil properties.

Water is essential in the formation of soil. Water dissolves soluble materials and is used by plants and animals. It transports material from one part of the soil to another part, or from one area to another area. The rate of chemical reactions and other processes in the soil are dependent to some extent on temperature. In addition, temperature affects the type and quantity of vegetation, the amount and kind of organic matter, and the decomposition rate of organic matter.

Relief

Relief implies relative elevation and is defined as the elevation or inequalities of a land surface considered collectively (*5*). The relationship of relief to soil properties is not well expressed in Camden and Glynn Counties. This is because the survey area is flat except for the gently sloping terrace interfaces. Features commonly related to relief are color of the soil, wetness, thickness and content of organic matter of the A horizon, and plant cover.

In Camden and Glynn Counties the obvious effects of relief are color of the soil and wetness. Albany and Cainhoy soils have a brownish and yellowish matrix in the upper part of the B horizon; Bladen and Rains soils have a gray matrix throughout the B horizon. This color difference is attributed to a difference in elevation and a corresponding difference in internal drainage. Albany and Cainhoy soils are higher and better drained. This results in better oxidization and upper subsoils that are yellow and brown.

The movement of water across the soil surface and through the soil profile is controlled to a large extent by relief. Thus, the degree of wetness is affected. In Camden and Glynn Counties, however, tidal action is also a factor. Brookman soils have an umbric epipedon. These soils are in broad, shallow depressions and internal drainage is very poor. Fripp soils have an ochric epipedon. They are on undulating to rolling landscapes and the internal drainage is excessive. Satilla soils are an example of soils that formed in a saturated state caused by tidal action. The wet condition has contributed to the accumulation of a large amount of organic matter.

Time

The length of time the soil-forming factors act on the parent material determines to a large degree the characteristics of the soil. Determination of when soil formation began in the survey area is not exact, but the soils in Camden and Glynn Counties are considered the youngest in the state. Geologists have dated these young soils as Pleistocene or later.

Although these soils are young geologically, many are mature. Young soils do not have pedogenic horizons but do have an irregular decrease in content of carbon with an increase in depth. A mature soil is in equilibrium with the environment. It has readily recognizable pedogenic horizons and a regular decrease in content of carbon with an increase in depth.

Bohicket, Capers, and Rutlege soils receive sediment daily or annually from floodwaters. These young soils are commonly stratified and are not old enough to have a zone of illuviation. Albany and Bladen soils are on broad, stable landscapes where the soil-forming processes have been active for thousands of years. These mature soils have thick sola and well expressed zones of elluviation and illuviation.

References

(1) American Association of State Highway [and Transportation] Officials. 1970. Standard specifications for highway materials and methods of sampling and testing. Ed. 10, 2 vol., illus.

(2) American Society for Testing and Materials. 1974. Method for classification of soils for engineering purposes. ASTM Stand. D 2487-69. *In* 1974 Annual Book of ASTM Standards, Part 19, 464 pp., illus.

(3) Georgia Department of Natural Resources. 1976. Geologic map of Georgia. Geologic and Water Resources Division, Georgia Geological Survey. 1 p., map.

(4) Hoyt, John H. and John R. Hails. 1967. Pleistocene shoreline sediments in coastal Georgia; deposition and modification. Sci. 155, no. 3769: 1541-1543, illus.

(5) United States Department of Agriculture. 1951. Soil survey manual. U.S. Dep. Agric. Handb. 18, 503 pp., illus. [Supplements replacing pp. 173-188 issued May 1962]

(6) United States Department of Agriculture. 1975. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. Soil Conserv. Serv., U.S. Dep. Agric. Handb. 436, 754 pp., illus.

Glossary

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single mapping 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	More than 9

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coat, clay skin.

Complex, soil. A map unit of two or more kinds of soil occurring in such an intricate pattern that they cannot be shown separately on a soil map at the selected scale of mapping and publication.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is 40 or 80 inches (1 or 2 meters).

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cutbanks cave. Unstable walls of cuts made by earth-moving equipment. The soil sloughs easily.

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 for 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, as for example in "hillpeats" and "climatic moors."

Drainage, surface. Runoff, or surface flow of water, from an area.

Excess fines. Excess silt and clay. The soil does not provide a source of gravel or sand for construction purposes.

Fast intake. The rapid movement of water into the soil.

Favorable. Favorable soil features for the specified use.

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.

Flooding. The temporary covering of soil with water from overflowing streams, runoff from adjacent slopes, and tides. Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *occasional* that it occurs on an average of once or less in 2 years; and *frequent* that it occurs on an average of more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; *November-May*, for example, means that flooding can occur during the period November through May. Water standing for short periods after rainfall or commonly covering swamps and marshes is not considered flooding.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Habitat. The natural abode of a plant or animal; refers to the kind of environment in which a plant or animal normally lives, as opposed to the range or geographical distribution.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric and the more decomposed sapric material.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. The major horizons of mineral soil are as follows:

O horizon.—An organic layer, fresh and decaying plant residue, at the surface of a mineral soil.

A horizon.—The mineral horizon, formed or forming 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.

A2 horizon.—A mineral horizon, mainly a residual concentration of sand and silt high in content of resistant minerals as a result of the loss of silicate clay, iron, aluminum, or a combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or a combination of these; (2) by prismatic or blocky structure; (3) by redder or browner colors than those in the A horizon; or (4) by a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil lacks 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 from which the solum is presumed to have formed. If the material is known to differ from that in the solum the Roman numeral II precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

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.

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. Inadequate strength for supporting loads.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is greater than that of organic soil.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Muck. Dark colored, finely divided, well decomposed organic soil material mixed with mineral soil material. The content of organic matter is more than 20 percent.

Nutrient, plant. Any element taken in by a plant, essential to its growth, and used by it in the production of food and tissue. Plant nutrients are nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, zinc, and perhaps other elements obtained from the soil; and carbon, hydrogen, and oxygen obtained largely from the air and water.

Pan. A compact, dense layer in a soil. A pan impedes the movement of water and the growth of roots. The word "pan" is commonly combined with other words that more explicitly indicate the nature of the layer; for example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material. The great variety of unconsolidated organic and mineral material in which soil forms. Consolidated bedrock is not yet parent material by this concept.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture.

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. The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality that enables the soil to transmit water or air, measured as the number of inches per hour that water moves through the soil. Terms describing permeability are *very slow* (less than 0.06 inch), *slow* (0.06 to 0.20 inch), *moderately slow* (0.2 to 0.6 inch), *moderate* (0.6 to 2.0 inches), *moderately rapid* (2.0 to 6.0 inches), *rapid* (6.0 to 20 inches), and *very rapid* (more than 20 inches).

Phase, soil. A subdivision of a soil series or other unit in the soil classification system based on differences in the soil that affect its management. A soil series, for example, may be divided into phases on the bases of differences in slope, stoniness, thickness, or some other characterisitc that affects management. These differences are too small to justify separate series.

pH value. (See Reaction, soil). A numerical designation of acidity and alkalinity in soil.

Piping. Moving water of subsurface tunnels or pipelike cavities in 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 a semisolid to a plastic state.

Poor outlets. Surface or subsurface drainage outlets difficult or expensive to install.

Productivity (soil). The capability of a soil for producing a specified plant or sequence of plants under a specified system of management. Productivity is measured in terms of output, or harvest, in relation to input.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Root zone. The part of the soil that can be penetrated by plant roots.

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. The rapid movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils, formed from a particular type of parent material, having horizons that, except for the texture of the A or surface horizon, are similar in all profile characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineralogical and chemical composition.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slow refill. The slow filling of ponds, resulting from restricted permeability in the soil.

Soil. A natural, three-dimensional body at the earth's surface that 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.

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in mature soil consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristics of the soil are largely confined to the solum.

Stratified. Arranged in strata, or layers. The term refers to geologic material. Layers in soils that result from the processes of soil formation are called horizons; those inherited from the parent material are called strata.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates that are separated from adjoining aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that it can soak into the soil or flow slowly to a prepared outlet without harm. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

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, silt loam, 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. Otherwise suitable soil material too thin for the specified use.

Tilth, soil. The condition of the soil, especially the soil structure, as related to the growth of plants. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Topsoil (engineering). Presumably a fertile soil or soil material, or one that responds to fertilization, ordinarily rich in organic matter, used to topdress roadbanks, lawns, and gardens.

Water table. The upper limit of the soil or underlying rock material that is wholly saturated with water.

Water table, apparent. A thick zone of free water in the soil. An apparent water table is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.

Water table, artesian. A water table under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole.

Water table, perched. A water table standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

Month	Temperature[1]						Precipitation[1]				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days[2]	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January	61.4	42.4	52.0	79	20	177	2.91	1.11	4.35	6	.0
February	62.8	43.9	53.4	81	24	165	3.64	2.20	4.93	6	.1
March	68.6	49.8	59.2	86	30	303	3.84	1.88	5.44	6	.0
April	76.0	57.9	67.0	91	40	510	2.92	1.12	4.36	5	.0
May	82.7	65.7	74.2	96	50	750	3.70	1.73	5.31	6	.0
June	87.0	71.6	79.3	98	61	879	6.02	2.92	8.55	8	.0
July	89.3	73.7	81.6	98	68	980	6.01	3.27	8.25	9	.0
August	88.8	73.6	81.2	98	66	967	6.91	3.60	9.60	9	.0
September	84.8	71.0	77.9	95	58	837	7.53	3.38	10.90	8	.0
October	77.5	61.1	69.3	90	40	598	3.37	1.20	5.14	5	.0
November	69.2	50.2	59.7	84	30	295	1.96	.64	3.00	4	.0
December	63.0	43.9	53.5	80	23	181	2.66	1.13	3.89	5	.0
Year	75.9	58.7	67.4	99	19	6,642	51.47	42.66	59.88	77	.1

[1]Recorded in the period 1951-75 at Brunswick, Ga.

[2]A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50° F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

Probability	Temperature[1]		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	February 14	March 3	March 22
2 years in 10 later than--	February 5	February 21	March 14
5 years in 10 later than--	January 11	February 2	February 24
First freezing temperature in fall:			
1 year in 10 earlier than--	December 12	November 26	November 12
2 years in 10 earlier than--	December 27	December 5	November 19
5 years in 10 earlier than--	February 8	December 22	December 3

[1]Recorded in the period 1951-75 at Brunswick, Ga.

TABLE 3.--GROWING SEASON

Probability	Daily minimum temperature during growing season[1]		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	318	295	244
8 years in 10	335	303	257
5 years in 10	>365	320	281
2 years in 10	>365	338	305
1 year in 10	>365	354	317

[1]Recorded in the period 1951-75 at Brunswick, Ga.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Camden County	Glynn County	Total--	
				Area	Extent
		Acres	Acres	Acres	Pct
AdA	Albany fine sand, 0 to 2 percent slopes	7,075	2,849	9,924	1.5
Be	Beaches	700	600	1,300	0.2
Bk	Bladen loam	39,638	32,010	71,648	10.5
BO	Bohicket-Capers association	78,280	74,240	152,520	22.4
Br	Brookman clay loam	35,690	22,595	58,285	8.5
CaB	Cainhoy fine sand, 0 to 5 percent slopes	8,220	4,870	13,090	1.9
FdD	Fripp-Duckston complex, 0 to 20 percent slopes	4,890	2,245	7,135	1.0
Kk	Kingsland mucky peat	18,273	4,340	22,613	3.3
Ma	Mandarin fine sand	59,444	34,830	94,274	13.8
Mb	Mandarin-Urban land complex	210	4,215	4,425	0.6
Me	Meggett fine sandy loam	19,440	9,750	29,190	4.3
Mf	Meggett loam, frequently flooded	0	2,370	2,370	0.3
Om	Olustee sand	8,550	5,765	14,315	2.1
Pe	Pelham loamy sand	42,055	18,372	60,427	8.9
Po	Pottsburg sand	16,520	6,335	22,855	3.4
Ra	Rains fine sandy loam	6,560	6,840	13,400	2.0
Ru	Rutlege fine sand	21,285	17,440	38,725	5.7
Sa	Sapelo fine sand	29,360	8,500	37,860	5.6
Sb	Satilla loam	21,730	5,770	27,500	4.0
	Total	417,920	263,936	681,856	100.0

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Soil name and map symbol	Corn	Soybeans	Blueberries	Cabbage	Improved bermuda-grass	Bahiagrass
	Bu	Bu	Lb	Crate	AUM*	AUM*
AdA. Albany	65	25	6,000	---	7.0	6.5
Be**. Beaches						
Bk. Bladen	---	---	---	---	---	---
BO**:						
Bohicket	---	---	---	---	---	---
Capers	---	---	---	---	---	---
Br. Brookman	---	---	---	---	---	---
CaB. Cainhoy	55	20	5,500	---	6.5	5.0
FdD. Fripp-Duckston	---	---	---	---	---	---
Kk. Kingsland	---	---	---	---	---	---
Ma. Mandarin	---	---	5,500	---	---	6.0
Mb. Mandarin-Urban land	---	---	---	---	---	---
Me. Meggett	75	40	---	300	---	10.0
Mf. Meggett	---	---	---	---	---	---
Om. Olustee	70	30	6,000	---	---	8.5
Pe. Pelham	---	---	---	---	---	---
Po. Pottsburg	---	---	---	---	8.0	7.0
Ra. Rains	---	---	---	---	---	6.0
Ru. Rutlege	---	---	---	---	---	---
Sa. Sapelo	50	20	5,500	---	---	7.5
Sb. Satilla	130	45	---	320	---	10.5

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of this unit as a whole.

TABLE 6.--CAPABILITY CLASSES AND SUBCLASSES

[Miscellaneous areas are excluded. Dashes indicate no acreage]

Class	Total acreage	Major management concerns (Subclass)		
		Erosion (e)	Wetness (w)	Soil problem (s)
		Acres	Acres	Acres
I:				
Camden County	---	---	---	---
Glynn County	---	---	---	---
II:				
Camden County	---	---	---	---
Glynn County	---	---	---	---
III:				
Camden County	35,065	---	35,065	---
Glynn County	18,364	---	18,364	---
IV:				
Camden County	82,390	---	74,170	8,220
Glynn County	32,315	---	27,445	4,870
V:				
Camden County	81,693	---	81,693	---
Glynn County	50,382	---	50,382	---
VI:				
Camden County	116,629	---	56,975	59,654
Glynn County	79,080	---	40,035	39,045
VII:				
Camden County	23,163	---	18,273	4,890
Glynn County	8,955	---	6,710	2,245
VIII:				
Camden County	78,280	---	78,280	---
Glynn County	74,240	---	74,240	---

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Soil name and map symbol	Ordination symbol	Management concerns			Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	
AdA------------------ Albany	3w	Slight	Moderate	Moderate	Loblolly pine-------- Slash pine----------- Longleaf pine--------	80 80 67	Loblolly pine, slash pine.
Bk------------------ Bladen	2w	Slight	Severe	Severe	Loblolly pine-------- Slash pine----------- Sweetgum-------------	94 91 90	Loblolly pine, slash pine, American sycamore, water oak, Nuttall oak.
Br------------------ Brookman	2w	Slight	Severe	Severe	Baldcypress---------- Loblolly pine-------- Southern red oak----- Slash pine----------- Sweetgum------------- White oak------------ Yellow-poplar--------	--- 95 --- 95 94 --- ---	Loblolly pine, slash pine, sweetgum, water tupelo.
CaB------------------ Cainhoy	3s	Slight	Moderate	Moderate	Longleaf pine-------- Loblolly pine--------	70 76	Longleaf pine.
FdD*:							
Fripp---------------	4s	Slight	Moderate	Moderate	Slash pine----------- Longleaf pine-------- Loblolly pine--------	70 60 70	Slash pine, longleaf pine, loblolly pine, sand pine.
Duckston.							
Kk------------------ Kingsland	4w	Slight	Severe	Severe	Water tupelo--------- Baldcypress---------- Pond pine------------	--- --- 60	
Ma------------------ Mandarin	4s	Slight	Moderate	Severe	Slash pine----------- Longleaf pine--------	70 60	Slash pine, sand pine.
Me, Mf-------------- Meggett	1w	Slight	Severe	Severe	Slash pine----------- Loblolly pine-------- Pond pine------------	100 100 75	Slash pine, loblolly pine.
Om------------------ Olustee	3w	Slight	Moderate	Moderate	Slash pine----------- Loblolly pine-------- Longleaf pine--------	80 80 70	Slash pine, loblolly pine.
Pe------------------ Pelham	2w	Slight	Severe	Severe	Slash pine----------- Loblolly pine-------- Longleaf pine-------- Sweetgum------------- Blackgum------------- Water oak------------	90 90 74 80 80 80	Slash pine, loblolly pine.
Po------------------ Pottsburg	3w	Slight	Moderate	Moderate	Slash pine----------- Longleaf pine--------	80 70	Slash pine.
Ra------------------ Rains	2w	Slight	Severe	Severe	Loblolly pine-------- Slash pine----------- Sweetgum-------------	94 91 90	Loblolly pine, slash pine.
Ru------------------ Rutlege	2w	Slight	Severe	Severe	Loblolly pine-------- Sweetgum-------------	90 90	Loblolly pine, baldcypress.

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Potential productivity: Common trees	Potential productivity: Site index	Trees to plant
Sa: Sapelo	3w	Slight	Moderate	Moderate	Loblolly pine	77	Loblolly pine, slash pine.
					Slash pine	77	
					Longleaf pine	65	
Sb: Satilla	3w	Slight	Severe	Severe	Blackgum	---	
					Baldcypress	---	
					Red maple	---	
					Sweetgum	80	
					Water oak	80	
					Water tupelo	---	
					Yellow-poplar	90	

* See description of the map unit for composition and behavior characteristics of this unit as a whole.

TABLE 8.--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]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
AdA: Albany	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.
Be*. Beaches					
Bk: Bladen	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.
BO*:					
Bohicket	Severe: floods, too clayey, wetness.	Severe: floods, shrink-swell, low strength.	Severe: floods, shrink-swell, low strength.	Severe: floods, shrink-swell, low strength.	Severe: floods, shrink-swell, low strength.
Capers	Severe: floods, wetness.	Severe: floods, low strength.	Severe: floods, low strength.	Severe: floods, low strength.	Severe: floods, low strength.
Br: Brookman	Severe: floods, wetness.	Severe: floods, low strength, wetness.	Severe: floods, low strength, wetness.	Severe: floods, low strength, wetness.	Severe: floods, low strength, wetness.
CaB: Cainhoy	Severe: cutbanks cave.	Slight	Slight	Slight	Slight.
FdD*:					
Fripp	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
Duckston	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.
Kk: Kingsland	Severe: excess humus, floods, wetness.	Severe: floods, subsides, wetness.	Severe: floods, subsides, wetness.	Severe: floods, subsides, wetness.	Severe: floods, subsides, wetness.
Ma: Mandarin	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Mb*:					
Mandarin	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Urban land.					
Me: Meggett	Severe: wetness, too clayey.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, wetness.
Mf: Meggett	Severe: floods, wetness, too clayey.	Severe: floods, wetness, shrink-swell.	Severe: floods, wetness, shrink-swell.	Severe: floods, wetness, shrink-swell.	Severe: floods, shrink-swell, wetness.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
Om----------------- Olustee	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness, corrosive.	Severe: wetness.
Pe----------------- Pelham	Severe: floods, wetness, cutbanks cave.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.
Po----------------- Pottsburg	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ra----------------- Rains	Severe: wetness.	Severe: wetness.	Severe: wetness, floods.	Severe: wetness.	Severe: wetness, low strength.
Ru----------------- Rutlege	Severe: wetness, cutbanks cave, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.
Sa----------------- Sapelo	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Sb----------------- Satilla	Severe: wetness, excess humus, floods.	Severe: subsides, wetness, floods.	Severe: subsides, wetness, floods.	Severe: subsides, wetness, floods.	Severe: low strength, wetness, floods.

* See description of the map unit for composition and behavior characteristics of this unit as a whole.

TABLE 9.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AdA Albany	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness, seepage.	Severe: wetness, seepage.	Poor: too sandy, wetness.
Be*. Beaches					
Bk Bladen	Severe: wetness, floods.	Slight	Severe: wetness, floods.	Severe: wetness, floods.	Poor: wetness, too clayey.
BO*:					
Bohicket	Severe: floods, percs slowly, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Poor: too clayey, wetness.
Capers	Severe: wetness, floods.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Poor: too clayey, wetness.
Br Brookman	Severe: floods, percs slowly, wetness.	Slight	Severe: floods, wetness.	Severe: floods, wetness.	Poor: too clayey, wetness.
CaB Cainhoy	Slight	Severe: seepage.	Severe: too sandy, seepage.	Severe: seepage.	Poor: too sandy.
FdD*:					
Fripp	Moderate: slope.	Severe: slope, seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Duckston	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Poor: wetness.
Kk Kingsland	Severe: floods, wetness, subsides.	Severe: floods, wetness, excess humus.	Severe: excess humus, floods, wetness.	Severe: floods, seepage, wetness.	Poor: excess humus, wetness.
Ma Mandarin	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: wetness, seepage.	Poor: too sandy.
Mb*:					
Mandarin	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: wetness, seepage.	Poor: too sandy.
Urban land.					
Me Meggett	Severe: percs slowly, wetness.	Slight	Severe: too clayey, wetness.	Severe: wetness.	Poor: too clayey, wetness.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Mf-----------------Meggett	Severe: floods, percs slowly, wetness.	Severe: floods.	Severe: floods, too clayey, wetness.	Severe: floods, wetness.	Poor: too clayey, wetness.
Om-----------------Olustee	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: too sandy, seepage, wetness.
Pe-----------------Pelham	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Poor: wetness.
Po-----------------Pottsburg	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: wetness, seepage.	Poor: too sandy, wetness.
Ra-----------------Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Ru-----------------Rutlege	Severe: wetness, floods.	Severe: seepage, wetness, floods.	Severe: wetness, seepage, floods.	Severe: wetness, seepage, floods.	Poor: too sandy, wetness.
Sa-----------------Sapelo	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness, too sandy.
Sb-----------------Satilla	Severe: subsides, wetness, floods.	Severe: wetness, excess humus, floods.	Severe: wetness, excess humus, floods.	Severe: seepage, wetness, floods.	Poor: wetness.

* See description of the map unit for composition and behavior characteristics of this unit as a whole.

TABLE 10.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and "poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
AdA: Albany	Fair: wetness.	Poor: excess fines.	Unsuited: excess fines.	Poor: too sandy.
Be*. Beaches				
Bk: Bladen	Poor: wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
BO*:				
Bohicket	Poor: shrink-swell, low strength, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness, too clayey.
Capers	Poor: low strength, shrink-swell, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey, wetness.
Br: Brookman	Poor: low strength, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: too clayey, wetness.
CaB: Cainhoy	Good	Fair: excess fines.	Unsuited: excess fines.	Poor: too sandy.
FdD*:				
Fripp	Good	Good	Unsuited: excess fines.	Poor: too sandy.
Duckston	Poor: wetness.	Good	Unsuited: excess fines.	Poor: too sandy.
Kk: Kingsland	Poor: low strength, wetness.	Unsuited: excess humus.	Unsuited: excess humus.	Poor: wetness.
Ma: Mandarin	Fair: wetness.	Poor: thin layer.	Unsuited: excess fines.	Poor: too sandy.
Mb*:				
Mandarin	Fair: wetness.	Poor: thin layer.	Unsuited: excess fines.	Poor: too sandy.
Urban land.				
Me, Mf: Meggett	Poor: shrink-swell, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, wetness.
Om: Olustee	Good	Poor: excess fines.	Unsuited: excess fines.	Poor: too sandy.
Pe: Pelham	Poor: wetness.	Poor: excess fines.	Unsuited: excess fines.	Poor: wetness.
Po: Pottsburg	Fair: wetness.	Fair: excess fines.	Unsuited: excess fines.	Poor: too sandy.
Ra: Rains	Poor: wetness, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Ru: Rutlege	Poor: wetness.	Fair: excess fines.	Unsuited: excess fines.	Poor: too sandy, wetness.
Sa: Sapelo	Moderate: wetness.	Fair: excess fines.	Unsuited: excess fines.	Poor: too sandy, wetness.
Sb: Satilla	Poor: excess humus, low strength, wetness.	Unsuited: excess fines, excess humus.	Unsuited: excess fines, excess humus.	Poor: wetness.

* See description of the map unit for composition and behavior characteristics of this unit as a whole.

TABLE 11.--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]

Soil name and map symbol	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Limitations for-- Aquifer-fed excavated ponds	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Grassed waterways
AdA: Albany	Severe: seepage.	Moderate: seepage, wetness.	Moderate: slow refill.	Favorable	Fast intake, wetness.	Wetness.
Be*. Beaches						
Bk: Bladen	Slight	Moderate: low strength.	Slight	Floods, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
BO*:						
Bohicket	Slight	Severe: low strength, compressible, shrink-swell.	Severe: salty water.	Floods, percs slowly, wetness.	Not needed	Not needed.
Capers	Severe: excess humus.	Severe: low strength, shrink-swell.	Severe: slow refill.	Floods, percs slowly.	Floods, percs slowly.	Not needed.
Br: Brookman	Slight	Moderate: low strength, piping, hard to pack.	Slight	Floods, percs slowly.	Floods, wetness.	Not needed.
CaB: Cainhoy	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Not needed	Fast intake, droughty, slope.	Droughty, slope.
FdD*:						
Fripp	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Not needed	Droughty, fast intake, slope.	Droughty, slope.
Duckston	Severe: seepage.	Severe: seepage.	Slight	Wetness	Wetness	Not needed.
Kk: Kingsland	Severe: seepage.	Severe: excess humus, low strength, seepage.	Slight	Excess humus, poor outlets, wetness.	Floods, wetness.	Not needed.
Ma: Mandarin	Severe: seepage.	Severe: seepage, piping.	Moderate: deep to water.	Favorable	Wetness, droughty, fast intake.	Not needed.
Mb*:						
Mandarin	Severe: seepage.	Severe: seepage, piping.	Moderate: deep to water.	Favorable	Wetness, droughty, fast intake.	Not needed.
Urban land.						
Me: Meggett	Slight	Moderate: shrink-swell, hard to pack.	Moderate: slow refill.	Percs slowly, wetness.	Percs slowly, wetness.	Not needed.
Mf: Meggett	Slight	Moderate: shrink-swell, hard to pack.	Moderate: slow refill.	Floods, percs slowly, wetness.	Percs slowly, wetness.	Not needed.
Om: Olustee	Moderate: seepage.	Moderate: seepage, unstable fill.	Moderate: deep to water.	Wetness, cutbanks cave.	Wetness, fast intake.	Not needed.

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Grassed waterways
Pe----------------- Pelham	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Floods, wetness.	Floods, wetness.	Not needed.
Po----------------- Pottsburg	Severe: seepage.	Severe: seepage.	Moderate: deep to water.	Wetness, cutbanks cave.	Wetness, droughty, fast intake.	Not needed.
Ra----------------- Rains	Moderate: seepage.	Severe: wetness.	Moderate: slow refill.	Favorable------	Wetness, fast intake.	Wetness.
Ru----------------- Rutlege	Severe: seepage.	Severe: seepage, unstable fill, piping.	Slight---------	Cutbanks cave, wetness, floods.	Wetness, fast intake, droughty.	Wetness, droughty.
Sa----------------- Sapelo	Moderate: seepage.	Moderate: piping.	Slight---------	Wetness--------	Wetness--------	Not needed.
Sb----------------- Satilla	Severe: seepage.	Severe: excess humus, wetness.	Slight---------	Subsides, poor outlets, floods.	Wetness, floods.	Not needed.

* See description of the map unit for composition and behavior characteristics of this unit as a whole.

TABLE 12.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
AdA: Albany	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
Be*. Beaches				
Bk: Bladen	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness.
BO*:				
Bohicket	Severe: floods, too clayey, wetness.	Severe: floods, too clayey, wetness.	Severe: floods, too clayey, wetness.	Severe: floods, too clayey, wetness.
Capers	Severe: floods, too clayey.	Severe: floods, too clayey.	Severe: floods, too clayey.	Severe: floods, too clayey.
Br: Brookman	Severe: floods, wetness.	Severe: floods, too clayey, wetness.	Severe: floods, wetness.	Moderate: floods, wetness.
CaB: Cainhoy	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
FdD*:				
Fripp	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.
Duckston	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.
Kk: Kingsland	Severe: excess humus, floods, wetness.	Severe: excess humus, floods, wetness.	Severe: excess humus, floods, wetness.	Severe: excess humus, floods, wetness.
Ma: Mandarin	Severe: too sandy.	Severe: too sandy, wetness.	Severe: too sandy.	Severe: too sandy.
Mb*:				
Mandarin	Severe: too sandy.	Severe: too sandy, wetness.	Severe: too sandy.	Severe: too sandy.
Urban land.				
Me: Meggett	Severe: wetness, percs slowly.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.
Mf: Meggett	Severe: floods, wetness, percs slowly.	Severe: wetness, floods.	Severe: floods, wetness.	Moderate: floods, wetness.
Om: Olustee	Severe: wetness.	Severe: wetness.	Severe: wetness, too sandy.	Severe: wetness.

See footnote at end of table.

TABLE 12.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
Pe-------------------- Pelham	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Moderate: too sandy, floods.
Po-------------------- Pottsburg	Severe: wetness, too sandy.	Moderate: too sandy.	Severe: too sandy, wetness.	Moderate: too sandy.
Ra-------------------- Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ru-------------------- Rutlege	Severe: wetness, floods, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness, floods.	Severe: wetness, too sandy.
Sa-------------------- Sapelo	Severe: wetness, too sandy.	Moderate: wetness, too sandy.	Moderate: wetness, too sandy.	Moderate: wetness, too sandy.
Sb-------------------- Satilla	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Moderate: wetness, floods.

* See description of the map unit for composition and behavior characteristics of this unit as a whole.

TABLE 13.--WILDLIFE HABITAT POTENTIALS

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
AdA: Albany	Fair	Fair	Fair	Fair	Fair	Fair	Poor	Fair	Fair	Poor.
Be*. Beaches										
Bk: Bladen	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
BO*:										
Bohicket	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
Capers	---	---	---	---	---	Good	Good	---	---	Good.
Br: Brookman	Very poor.	Poor	Fair	Poor	Poor	Good	Good	Poor	Fair	Good.
CaB: Cainhoy	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
FdD*:										
Fripp	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.
Duckston	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Poor	Very poor.	Very poor.	Poor.
Kk: Kingsland	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Ma: Mandarin	Very poor.	Poor	Poor	Poor	Fair	Very poor.	Very poor.	Poor	Poor	Very poor.
Mb*:										
Mandarin	Very poor.	Poor	Poor	Poor	Fair	Very poor.	Very poor.	Poor	Poor	Very poor.
Urban land.										
Me: Meggett	Poor	Fair	Good	Fair	Good	Good	Good	Fair	Good	Good.
Mf: Meggett	Poor	Fair	Fair	Fair	Good	Good	Good	Fair	Good	Good.
Om: Olustee	Poor	Fair	Fair	Poor	Fair	Poor	Fair	Fair	Fair	Poor.
Pe: Pelham	Poor	Poor	Fair	Fair	Fair	Fair	Fair	Poor	Fair	Fair.
Po: Pottsburg	Very poor.	Poor	Poor	Poor	Fair	Very poor.	Very poor.	Poor	Poor	Very poor.
Ra: Rains	Very poor.	Very poor.	Very poor.	Fair	Fair	Good	Good	Very poor.	Poor	Good.
Ru: Rutlege	Very poor.	Poor	Poor	Poor	Poor	Fair	Good	Poor	Poor	Fair.

See footnote at end of table.

TABLE 13.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba-ceous plants	Hardwood trees	Conif-erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
Sa: Sapelo	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Fair	Fair	Fair.
Sb: Satilla	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Poor.

* See description of the map unit for composition and behavior characteristics of this unit as a whole.

TABLE 14.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
AdA-----------------Albany	0-48	Fine sand--------	SM	A-2	0	100	100	75-90	12-23	---	NP
	48-80	Sandy clay loam, sandy loam, fine sandy loam.	SC, SM, SM-SC	A-2, A-4, A-6	0	97-100	95-100	70-100	25-50	<40	NP-17
Be*. Beaches											
Bk-----------------Bladen	0-5	Loam-------------	CL, ML, CL-ML	A-4	0	100	98-100	80-100	51-90	<30	NP-10
	5-60	Clay, sandy clay	CL, CH	A-7	0	100	99-100	75-100	55-85	45-65	23-45
	60-65	Clay, sandy clay, clay loam.	CL, CH, SC	A-4, A-6, A-7	0	100	89-99	75-95	45-75	25-60	8-35
BO*:											
Bohicket-----------	0-8	Silty clay loam	CH, MH	A-7	0	100	99-100	98-100	90-100	60-100	30-60
	8-65	Silty clay, clay	CH, MH	A-7	0	100	99-100	80-100	70-95	50-100	19-60
Capers-------------	0-8	Silty clay-------	MH	A-7-5	0	100	100	80-100	70-100	50-80	15-40
	8-60	Clay, silty clay	MH	A-7-5	0	100	100	85-100	75-100	60-80	18-40
Br-----------------Brookman	0-15	Clay loam--------	CL, ML, CL-ML	A-6, A-4, A-8	0	100	95-100	75-100	51-85	25-40	6-20
	15-58	Sandy clay, clay	CH, CL	A-7, A-6	0	100	98-100	85-100	55-91	37-65	18-41
	58-65	Sandy clay, clay, sandy clay loam.	CL, CH, SC	A-6, A-7	0	100	90-100	70-100	43-90	25-55	11-35
CaB-----------------Cainhoy	0-99	Fine sand--------	SP-SM, SM	A-3, A-2	0	100	100	80-100	5-18	---	NP
FdD*:											
Fripp--------------	0-6	Fine sand--------	SP, SP-SM	A-3	0	100	98-100	85-99	0-5	---	NP
	6-80	Fine sand, sand	SP, SP-SM	A-3	0	100	98-100	85-99	0-5	---	NP
Duckston-----------	0-80	Sand-------------	SP, SP-SM	A-2, A-3	0	100	95-100	60-75	3-10	---	NP
Kk-----------------Kingsland	0-65	Mucky peat-------	PT	A-8	0-5	---	---	---	---	---	---
Ma-----------------Mandarin	0-19	Fine sand--------	SP, SP-SM	A-3	0	100	100	90-100	2-10	---	NP
	19-34	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	100	100	90-100	5-15	---	NP
	34-62	Fine sand, sand	SP, SP-SM	A-3	0	100	100	90-100	2-7	---	NP
	62-80	Fine sand, sand	SP, SP-SM	A-3, A-2-4	0	100	100	90-100	3-12	---	NP
Mb*:											
Mandarin-----------	0-19	Fine sand--------	SP, SP-SM	A-3	0	100	100	90-100	2-10	---	NP
	19-34	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	100	100	90-100	5-15	---	NP
	34-62	Fine sand, sand	SP, SP-SM	A-3	0	100	100	90-100	2-7	---	NP
	62-80	Fine sand, sand	SP, SP-SM	A-3, A-2-4	0	100	100	90-100	3-12	---	NP
Urban land.											

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	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	
Me----------------- Meggett	0-8	Fine sandy loam	SM	A-2, A-4	0	100	90-100	85-100	13-41	---	NP
	8-52	Clay, sandy clay, clay loam.	CH, MH, CL	A-6, A-7	0	100	90-100	85-100	51-90	30-70	20-40
	52-65	Sandy clay, clay loam, sandy clay loam.	CL, SC, SM	A-4, A-6, A-2	0	90-100	65-100	50-100	35-60	<40	NP-25
Mf----------------- Meggett	0-8	Loam-------------	CL, ML, CL-ML	A-4	0	100	90-100	85-100	51-75	<35	NP-10
	8-52	Clay, sandy clay, clay loam.	CH, MH, CL	A-6, A-7	0	100	90-100	85-100	51-90	30-70	20-40
	52-65	Sandy clay, clay loam, sandy clay loam.	CL, SC, SM	A-4, A-6, A-2	0	90-100	65-100	50-100	35-60	<40	NP-25
Om----------------- Olustee	0-5	Sand-------------	SP-SM, SM	A-3, A-2-4	0	100	100	75-100	5-15	---	NP
	5-19	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	100	100	75-100	8-15	---	NP
	19-35	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	100	100	75-100	5-15	---	NP
	35-80	Sandy clay loam, sandy loam.	SC	A-2, A-4, A-6	0	100	100	85-100	30-45	25-38	8-15
Pe----------------- Pelham	0-25	Loamy sand------	SM	A-2	0	100	95-100	75-90	15-30	---	NP
	25-40	Sandy clay loam, sandy loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	100	95-100	65-90	30-50	18-30	2-12
	40-75	Sandy clay loam, sandy loam, sandy clay.	SC, SM-SC, ML, CL	A-2, A-4, A-6, A-7	0	100	95-100	65-90	30-65	20-45	5-20
Po----------------- Pottsburg	0-63	Sand-------------	SP-SM	A-3, A-2-4	0	100	100	90-100	5-18	---	NP
	63-80	Sand, fine sand	SP-SM	A-3, A-2-4	0	100	100	90-100	5-18	---	NP
Ra----------------- Rains	0-18	Fine sandy loam	SM, ML	A-2, A-4	0	100	95-100	50-85	25-56	<35	NP-10
	18-36	Sandy clay loam, clay loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0	100	98-100	65-98	30-70	18-40	4-18
	36-65	Sandy clay loam, clay loam, sandy clay.	SC, SM-SC, CL, CL-ML	A-4, A-6, A-7	0	100	98-100	65-98	36-72	18-45	4-22
Ru----------------- Rutlege	0-15	Fine sand-------	SM, SP-SM	A-2, A-3	0	95-100	95-100	50-80	5-35	---	NP
	15-70	Sand, loamy sand, loamy fine sand.	SP-SM, SP, SM	A-2, A-3	0	95-100	95-100	50-80	2-25	---	NP
Sa----------------- Sapelo	0-17	Fine sand-------	SM, SP, SP-SM	A-2, A-3	0	100	100	90-100	4-20	---	NP
	17-25	Fine sand, sand	SM, SP-SM	A-2, A-3	0	100	100	95-100	8-20	---	NP
	25-49	Fine sand, sand	SM, SP, SP-SM	A-2, A-3	0	100	100	90-100	4-15	---	NP
	49-84	Sandy loam, sandy clay loam, fine sandy loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	100	100	90-100	20-50	<40	NP-20

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Sb----------------- Satilla	0-5	Loam------------	ML, CL, CL-ML	A-4, A-6	0	100	95-100	70-100	60-90	<35	NP-20
	5-24	Clay loam, silty clay loam, sandy clay loam.	MH, CL	A-6, A-7	0	100	95-100	85-100	50-99	30-75	11-35
	24-65	Muck------------	PT	---	---	---	---	---	---	---	---

* See description of the map unit for composition and behavior characteristics of this unit as a whole.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors K	Erosion factors T
	In	In/hr	In/in	pH	Mmhos/cm			
AdA----------------- Albany	0-48	6.0-20	0.02-0.04	4.5-6.5	<2	Low-----------	0.17	5
	48-80	0.6-2.0	0.10-0.16	4.5-6.0	<2	Low-----------	0.24	
Be*. Beaches								
Bk----------------- Bladen	0-5	0.6-2.0	0.14-0.18	3.6-5.5	<2	Low-----------	0.10	---
	5-60	0.06-0.2	0.12-0.16	3.6-5.5	<2	Moderate-----	---	
	60-65	0.06-0.2	0.12-0.16	3.6-5.5	<2	Moderate-----	---	
BO*:								
Bohicket--------	0-8	0.06-0.2	0.14-0.18	6.1-8.4	>8	High---------	0.32	5
	8-65	<0.06	0.12-0.16	6.1-8.4	>8	High---------	0.24	
Capers----------	0-8	0.06-0.2	0.01-0.03	6.6-7.8	>16	Very high----	---	---
	8-60	<0.06	0.01-0.03	6.6-7.8	>16	Very high----	---	
Br----------------- Brookman	0-15	0.6-2.0	0.15-0.20	5.1-6.5	<2	Low-----------	0.24	4
	15-58	0.6-2.0	0.18-0.22	5.1-6.5	<2	Moderate-----	0.28	
	58-65	0.06-0.2	0.12-0.16	5.1-7.8	<2	Moderate-----	0.24	
CaB---------------- Cainhoy	0-99	6.0-20	0.05-0.08	4.5-6.5	<2	Low-----------	0.10	5
FdD*:								
Fripp-----------	0-6	6.0-20	0.02-0.08	5.6-7.8	<2	Low-----------	0.10	5
	6-80	6.0-20	0.02-0.06	5.6-7.8	<2	Low-----------	0.10	
Duckston--------	0-80	>20	0.02-0.05	5.6-7.8	<2	Low-----------	0.10	---
Kk----------------- Kingsland	0-65	6.0-20	0.45-0.50	4.5-6.5	<2	Low-----------	---	---
Ma----------------- Mandarin	0-19	6.0-20	0.03-0.07	3.6-6.0	<2	Low-----------	0.15	5
	19-34	0.6-2.0	0.10-0.15	3.6-6.0	<2	Low-----------	0.20	
	34-62	6.0-20	0.03-0.07	5.6-7.3	<2	Low-----------	0.15	
	62-80	0.6-2.0	0.10-0.15	5.6-7.3	<2	Low-----------	0.15	
Mb*:								
Mandarin--------	0-19	6.0-20	0.03-0.07	3.6-6.0	<2	Low-----------	0.15	5
	19-34	0.6-2.0	0.10-0.15	3.6-6.0	<2	Low-----------	0.20	
	34-62	6.0-20	0.03-0.07	5.6-7.3	<2	Low-----------	0.15	
	62-80	0.6-2.0	0.10-0.15	5.6-7.3	<2	Low-----------	0.15	
Urban land.								
Me----------------- Meggett	0-8	2.0-6.0	0.10-0.15	5.6-6.5	<2	Low-----------	0.24	4
	8-52	0.06-0.2	0.13-0.18	6.1-8.4	<2	High---------	0.32	
	52-65	0.2-2.0	0.12-0.16	6.1-8.4	<2	Moderate-----	0.28	
Mf----------------- Meggett	0-8	0.6-2.0	0.15-0.20	5.6-6.5	<2	Low-----------	0.32	4
	8-52	0.06-0.2	0.13-0.18	6.1-8.4	<2	High---------	0.32	
	52-65	0.2-2.0	0.12-0.16	6.1-8.4	<2	Moderate-----	0.28	
Om----------------- Olustee	0-5	6.0-20	0.05-0.10	4.5-5.5	<2	Low-----------	0.20	5
	5-19	0.6-2.0	0.10-0.15	4.5-5.5	<2	Low-----------	0.20	
	19-35	6.0-20	0.03-0.08	4.5-5.5	<2	Low-----------	0.20	
	35-80	0.6-2.0	0.10-0.15	4.5-5.5	<2	Low-----------	0.32	
Pe----------------- Pelham	0-25	6.0-20	0.05-0.08	4.5-5.5	<2	Low-----------	0.10	5
	25-40	0.6-2.0	0.10-0.13	4.5-5.5	<2	Low-----------	0.24	
	40-75	0.6-2.0	0.10-0.16	4.5-5.5	<2	Low-----------	0.24	

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors	
							K	T
	In	In/hr	In/in	pH	Mmhos/cm			
Po----------------	0-63	6.0-20	0.03-0.07	4.5-6.5	<2	Low----------	0.15	5
Pottsburg	63-80	0.6-2.0	0.07-0.10	4.5-6.0	<2	Low----------	0.20	
Ra----------------	0-18	2.0-6.0	0.08-0.12	4.5-6.5	<2	Low----------	0.17	5
Rains	18-36	0.6-2.0	0.10-0.15	4.5-5.5	<2	Low----------	0.24	
	36-65	0.6-2.0	0.10-0.15	4.5-5.5	<2	Low----------	0.28	
Ru----------------	0-15	6.0-20	0.04-0.10	3.6-5.0	<2	Low----------	0.17	5
Rutlege	15-70	6.0-20	0.04-0.08	3.6-5.0	<2	Low----------	0.17	
Sa----------------	0-17	6.0-20	0.03-0.07	3.6-5.5	<2	Low----------	0.17	5
Sapelo	17-25	0.6-2.0	0.10-0.15	3.6-5.5	<2	Low----------	0.15	
	25-49	6.0-20	0.03-0.07	3.6-5.5	<2	Low----------	0.17	
	49-84	0.6-2.0	0.12-0.17	3.6-5.5	<2	Low----------	0.24	
Sb----------------	0-5	2.0-6.0	0.18-0.24	4.5-5.5	<2	Low----------	0.28	2
Satilla	5-24	2.0-6.0	0.18-0.24	4.5-5.5	<2	Moderate-----	0.24	
	24-65	---	---	---	---	-------------	---	

* See description of the map unit for composition and behavior characteristics of this unit as a whole.

TABLE 16.--SOIL AND WATER FEATURES

[The definitions of "flooding" and "water table" in the Glossary explain terms such as "rare," "brief," "apparent," and "perched." The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern]

Soil name and map symbol	Hydro- logic group	Flooding			High water table			Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Ini- tial	Total	Uncoated steel	Concrete
					Ft			In	In		
AdA: Albany	C	None	---	---	1.0-2.5	Apparent	Dec-Mar	---	---	High	High.
Be*. Beaches											
Bk: Bladen	D	Common	Long	Jan-Apr	0-1.0	Apparent	Dec-May	---	---	High	High.
BO*:											
Bohicket**	D	Frequent	Very brief	Jan-Dec	+3-0	Apparent	Jan-Dec	6-12	6-12	High	High.
Capers**	D	Frequent	Very long	Jan-Dec	+1-1.0	Apparent	Jan-Dec	3-6	3-6	High	High.
Br: Brookman	D	Common	Long	Nov-Apr	0-1.0	Apparent	Nov-May	---	---	Moderate	Moderate.
CaB: Cainhoy	A	None	---	---	>6.0	---	---	---	---	Low	Moderate.
FdD*:											
Fripp	A	None	---	---	>6.0	---	---	---	---	Low	Low.
Duckston	D	Frequent	Long to very long.	Jan-Dec	1.0-2.0	Apparent	Jan-Dec	---	---	Low	Low.
Kk: Kingsland**	A/D	Common	Very long	Jan-Dec	+2-0.5	Apparent	Jan-Dec	5-10	30-60	Moderate	Moderate.
Ma: Mandarin	A/D	None	---	---	1.5-3.5	Apparent	Jun-Dec	---	---	Moderate	High.
Mb*:											
Mandarin	A/D	None	---	---	1.5-3.5	Apparent	Jun-Dec	---	---	Moderate	High.
Urban land.											
Me: Meggett	D	None	---	---	0-1.0	Apparent	Nov-Apr	---	---	High	Moderate.
Mf: Meggett	D	Frequent	Brief	Dec-Apr	0-1.0	Apparent	Nov-Apr	---	---	High	Moderate.
Om: Olustee	B/D	None	---	---	0-1.0	Apparent	Jun-Sep	---	---	High	High.
Pe: Pelham	B/D	Common	Brief	Dec-Mar	0.5-1.5	Apparent	Jan-Apr	---	---	High	High.
Po: Pottsburg	A/D	None	---	---	1.0-3.5	Apparent	Jun-Feb	---	---	High	High.
Ra: Rains	B/D	None	---	---	0-1.0	Apparent	Nov-Apr	---	---	High	High.
Ru: Rutlege	D	Common	Brief	Dec-May	0-1.0	Apparent	Dec-May	---	---	High	High.
Sa: Sapelo	D	None	---	---	1.5-2.5	Apparent	Nov-Apr	---	---	High	High.
Sb: Satilla**	D	Frequent	Long	Dec-Apr	+3-1.5	Apparent	Nov-May	1-2	2-6	High	High.

* See description of the map unit for composition and behavior characteristics of this unit as a whole.
** A plus sign under "Depth to high water table" indicates ponding.

TABLE 17.--ENGINEERING TEST DATA

[Dashes indicate data were not available. NP means nonplastic]

Soil name, report number, horizon, and depth in inches	Classification		Grain size distribution: Percentage passing sieve--				Grain size distribution: Percentage smaller than--			Liquid limit	Plasticity index	Moisture density		Percentage volume change		
	AASHTO	Unified	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm			Max. dry density	Optimum moisture	Total	Swell	Shrink
										Pct		Lb/ft3	Pct	Pct	Pct	Pct
Brookman clay loam: (S76GA-039-007)																
B21tg----15 to 33	A-7-6(20)	CH	100	100	100	57	--	--	--	59	41	92	23	34.9	26.5	8.4
B22tg----33 to 58	A-7-6(17)	CH	100	100	99	55	--	--	--	59	37	--	--	--	--	--
B3g------58 to 65	A-7-6(14)	CL	100	100	99	57	--	--	--	46	31	94	24	41.2	27.5	13.7
Meggett fine sandy loam: (S76GA-039-004)																
A---------0 to 8	A-2-4(00)	SM	100	100	99	26	15	8	6	--	NP	103	11	5.1	4.3	0.8
B22tg----16 to 43	A-6 (10)	CL	100	100	99	61	54	48	45	40	20	100	20	43.7	32.4	11.3
B3g------52 to 65	A-2-4(00)	SM	100	100	100	35	28	25	23	--	NP	104	15	26.5	22.9	3.6
Rutlege fine sand: (S73GA-020-004)																
A11-------0 to 12	A-2-4(00)	SM	100	100	74	34	7	4	1	--	NP	53	57	21.1	6.0	15.1
C1g------15 to 26	A-3 (00)	SP-SM	100	100	98	7	4	2	1	--	NP	94	17	2.7	0.0	2.7
Sapelo fine sand: (S73GA-020-002)																
A2--------4 to 17	A-2-4(00)	SM	100	100	99	13	5	2	2	--	NP	94	14	4.2	0.0	4.2
B22h-----19 to 22	A-2-4(00)	SM	100	100	99	18	10	5	5	--	NP	99	15	3.5	0.8	2.7
B'2tg----49 to 84	A-2-4(00)	SM	100	100	99	30	27	25	24	24	3	108	13	17.0	2.6	14.4

TABLE 18.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Albany	Loamy, siliceous, thermic Grossarenic Paleudults
Bladen	Clayey, mixed, thermic Typic Albaquults
Bohicket	Fine, mixed, nonacid, thermic Typic Sulfaquents
Brookman	Fine, mixed, thermic Typic Umbraqualfs
Cainhoy	Thermic, coated Typic Quartzipsamments
Capers	Fine, mixed, nonacid, thermic Typic Sulfaquents
Duckston	Mixed, thermic Typic Psammaquents
Fripp	Mixed, thermic Typic Udipsamments
Kingsland	Euic, thermic Typic Medihemists
Mandarin	Sandy, siliceous, thermic Typic Haplohumods
Meggett	Fine, mixed, thermic Typic Albaqualfs
Olustee	Sandy, siliceous, thermic Ultic Haplaquods
Pelham	Loamy, siliceous, thermic Arenic Paleaquults
Pottsburg	Sandy, siliceous, thermic Grossarenic Haplaquods
Rains	Fine-loamy, siliceous, thermic Typic Paleaquults
Rutlege	Sandy, siliceous, thermic Typic Humaquepts
Sapelo	Sandy, siliceous, thermic Ultic Haplaquods
Satilla	Fine-loamy, mixed, acid, thermic Thapto-Histic Fluvaquents

☆U.S. GOVERNMENT PRINTING OFFICE: 1980-291-912/39

NRCS Accessibility Statement