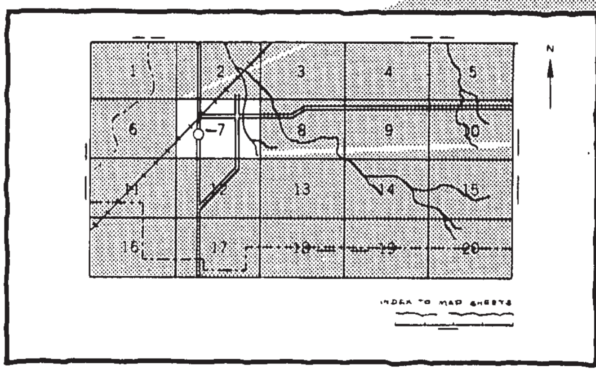
SOIL SURVEY OF

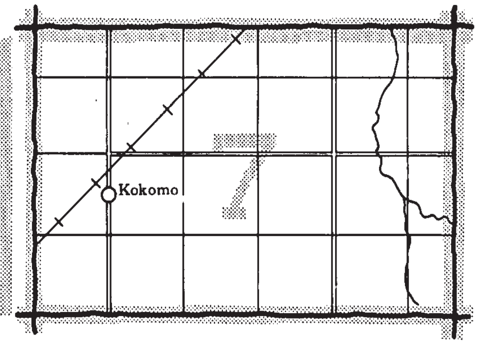
Calhoun and Dallas Counties, Arkansas

United States Department of Agriculture
Soil Conservation Service
in cooperation with
Arkansas Agricultural Experiment Station

HOW TO USE

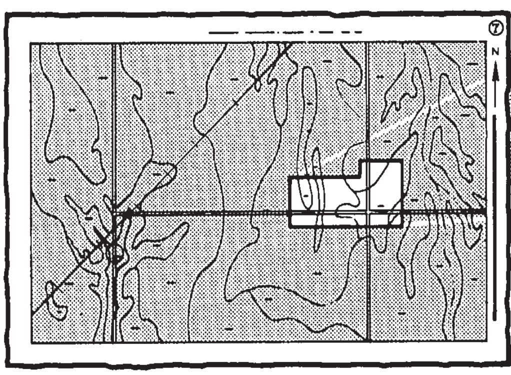
1. Locate your area of interest on the "Index to Map Sheets" (the last page of this publication).

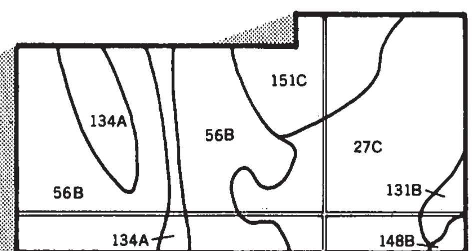




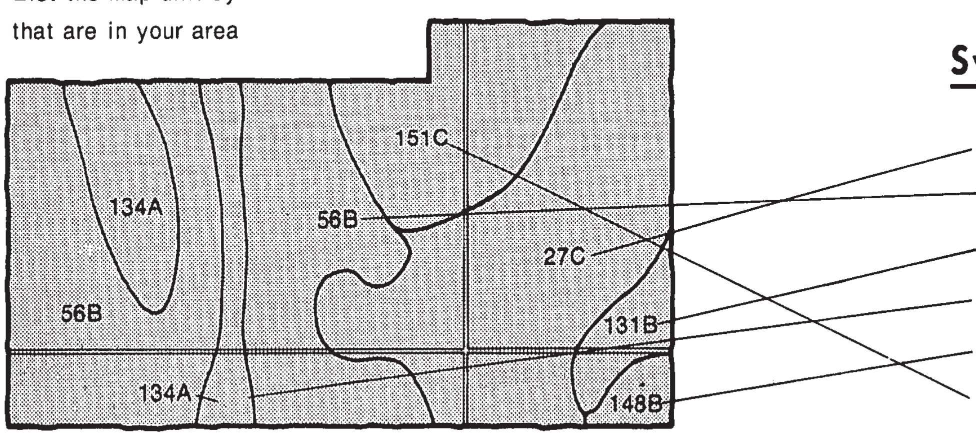
2. Note the number of the map sheet and turn to that sheet.

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





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

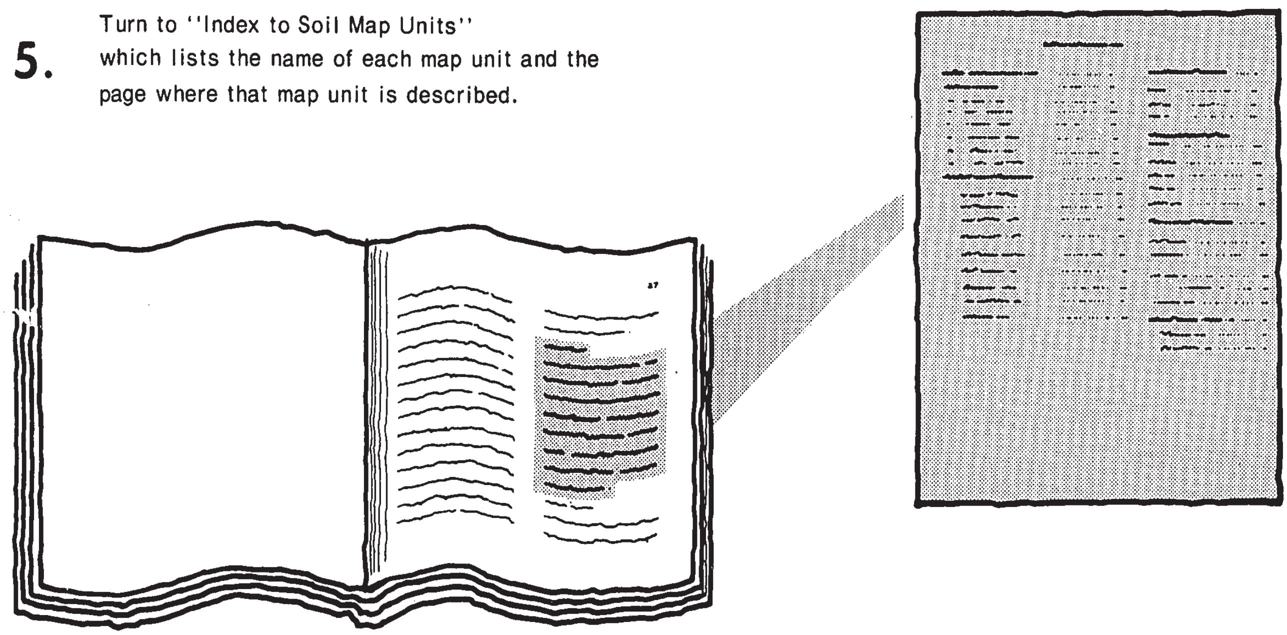


Symbols

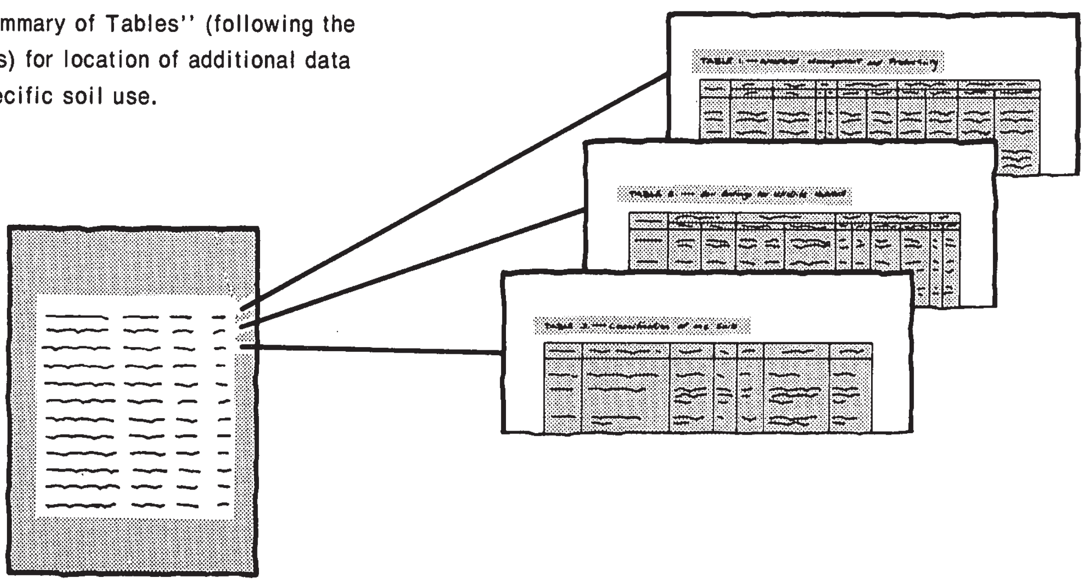
27C
56B
131B
134A
148B
151C

HIS 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; for 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 1972-76. 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 Arkansas Agricultural Experiment Station. It is part of the technical assistance furnished to the Calhoun County Conservation District and the Dallas County Soil and Water Conservation District.

Soil maps in this survey may be copied without permission, but any enlargement of these maps can 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.

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Issued January 1980

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Foreword

The Soil Survey of Calhoun and Dallas Counties contains much information useful in any land-planning program. 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.

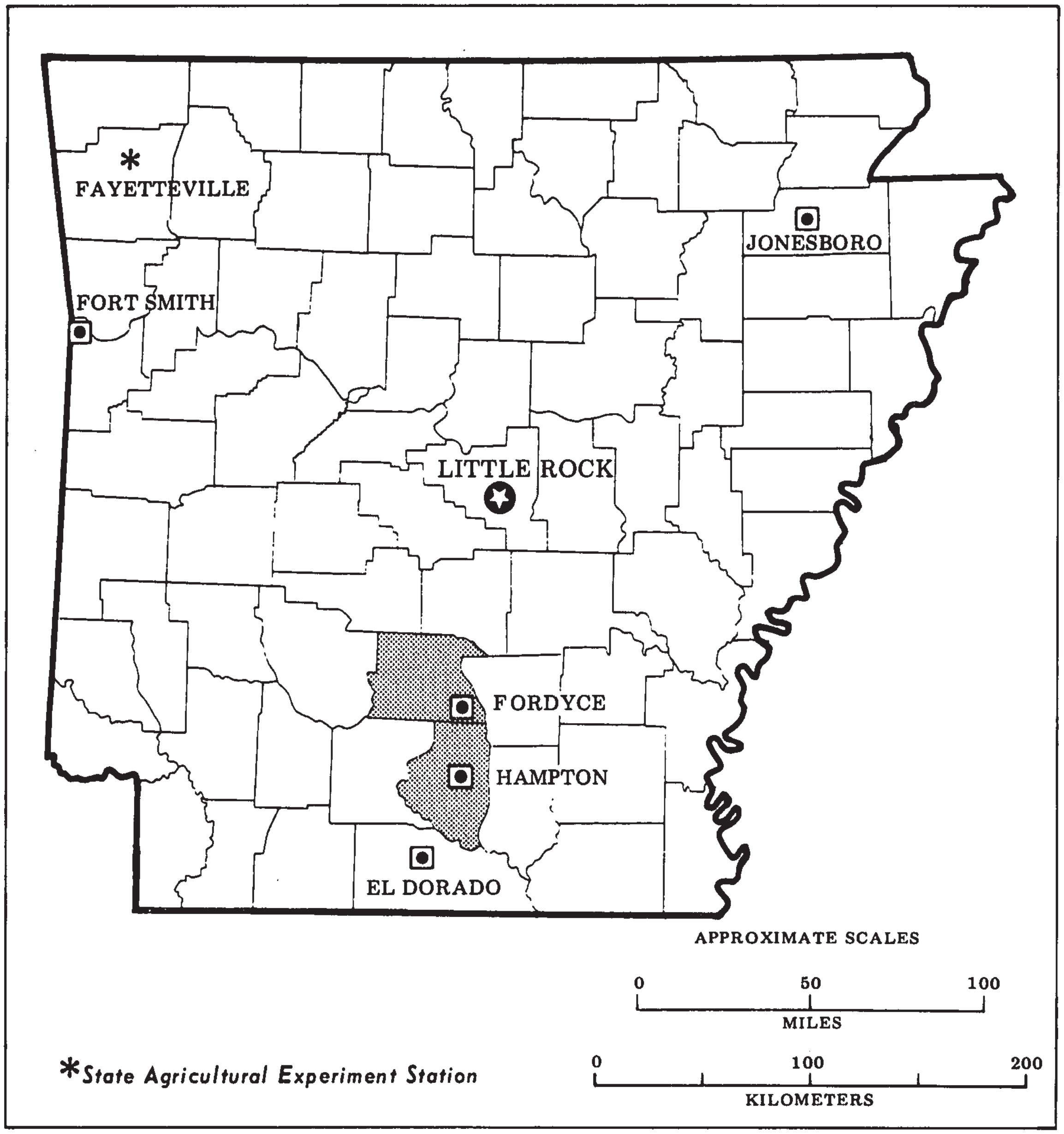
This soil survey has been prepared for many different users. Farmers, ranchers, foresters, and agronomists can use it to determine the potential of the soil and the management practices required for food and fiber production. Planners, community officials, engineers, developers, builders, and homebuyers 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.

M.J. Spears
State Conservationist
Soil Conservation Service



Location of Calhoun and Dallas Counties in Arkansas.

SOIL SURVEY OF CALHOUN AND DALLAS COUNTIES, ARKANSAS

By Hiram V. Gill, Fred C. Larance, Charles L. Fultz,
and Don C. Avery, Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service
in cooperation with the Arkansas Agricultural Experiment Station

Calhoun County is in the south-central part of Arkansas about 65 miles west of the Mississippi River and 18 miles north of Louisiana. It is irregular in shape and has natural stream boundaries on three of its four sides. It is bound on the north by Dallas County, on the east by Cleveland and Bradley Counties, on the south by Union County, and on the west by Ouachita County. The total area is 632 square miles, or 404,480 acres. The land area is about 629 square miles, or 402,304 acres, and includes 1,464 acres of water in bodies of less than 40 acres.

Hampton is the county seat of Calhoun County. The population of the county, according to the 1970 Census, was 5,573. Most of the county is in timber, and the chief industries are related to timber production.

Dallas County, also in the south-central part of Arkansas, is about 65 miles west of the Mississippi River and about 55 miles north of Louisiana. It is roughly a square but has irregular natural stream boundaries on parts of the east and west sides. It is bound on the north by Hot Spring and Grant Counties, on the east by Cleveland County, on the south by Calhoun and Ouachita Counties, and on the west by Clark County. The total land area is 672 square miles, or 430,080 acres, and includes 695 acres of water in bodies of less than 40 acres.

Fordyce is the county seat of Dallas County. The population of the county, according to the 1970 Census, was 10,022. Most of the county is in timber, and the chief industries are related to timber production.

General nature of the counties

In the following paragraphs, the farming, physiography and drainage, and climate in Calhoun and Dallas Counties are described.

Farming

The early economy of the survey area was based on general farming. The first settlers, who arrived in the early 1840's, were mainly subsistence farmers. With the introduction of the cotton gin to Calhoun County a few years later, cotton became the main cash crop in that county. The main crops in Dallas County were corn, cotton, peas, and other vegetables.

In the 1930's reforestation efforts were begun to restore once-cleared land to woodland. Now, more than 90 percent of the survey area is woodland managed for the production of pulpwood and sawlogs. Most of the remaining land is used for pasture and hay crops, and small acreages are used for tomatoes, corn, grain sorghum, soybeans, rice, and small grain. In 1974 only about 9 percent of Dallas County and about 7 percent of Calhoun County remained in farms.

Between 1969 and 1974, the number of farms in the survey area decreased. In Calhoun County the size of the average farm decreased, while in Dallas County the size of the average farm increased. Most farms were operated by their owners.

Table 1 compares the acreage of principal crops and pasture grown in the survey area in 1969 and 1974, and table 2 compares the number and kind of livestock and poultry in the survey area in those years.

Physiography and drainage

All of Calhoun and Dallas Counties are on the Southern Coastal Plain. The soils formed in unconsolidated marine sediments and are predominantly low in content of plant nutrients. Three main topographic divisions can be made: the rolling uplands, the flatwoods uplands, and the stream flood plains.

The rolling uplands comprise most of the survey area. The ridges generally run in a north-south direction.

Slopes are mainly 1 to 8 percent but range from 0 to 20 percent.

The flatwoods uplands lie mainly south and west of the rolling uplands. Slopes are mainly less than 1 percent, but low ridges within the area have slopes of as much as 8 percent.

The largest flood plains are along the Ouachita River, Moro Creek, and the Saline River, which flow southeasterly. Extensive flooding is frequent along these streams. Slopes in these areas are generally less than 1 percent, but some undulating tracts have short slopes of as much as 3 percent. Smaller areas of flood plains are along the small tributary streams. Most of these smaller areas have slopes of less than 1 percent and are subject to frequent flooding.

The small streams in the northeastern part of Dallas County flow northeasterly into the Saline River, those in the eastern third of both counties flow southeasterly into Moro Creek, and the rest flow southwestward into the Ouachita River.

The major tributary streams in Calhoun County are Whitewater, Caney, and Lloyd Creeks, which flow to the southeast, and Champagnolle Creek, Locust Bayou, and Two Bayou Creek, which flow to the south. The major tributary streams in Dallas County are Cooks, Hurricane, and Bryant Creeks, which flow to the east, and Tulip and Cypress Creeks, which flow to the southwest.

The lowest elevation in Calhoun County is about 67 feet above sea level near Moro Bay, and the highest is about 400 feet near the Dallas County line north of Thornton. The lowest elevation in Dallas County is about 120 feet above sea level near Tates Bluff on the Ouachita River, and the highest is about 492 feet north of Tulip.

There is a good supply of surface water in Calhoun and Dallas Counties. The principal streams—the Ouachita River, the Saline River, and Moro Creek—flow the year round. There are several natural lakes along the Ouachita River in Calhoun County. The largest are Champagnolle Creek Lake, Bang Slough, and Moro Bay. The largest manmade lake, Tri-County Lake, is in the northeastern part of Calhoun County. Many farms have small ponds that furnish water for livestock and recreation.

Ground water is generally in good supply. Wells in most parts of the county yield adequate water for household use.

Climate

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

Table 3 gives data on temperature and precipitation for the survey area, as recorded at Fordyce for the period 1951 to 1975. Table 4 shows probable dates of the first freeze in fall and the last freeze in spring. Table 5 provides data on length of the growing season.

In winter the average temperature is 46 degrees F, and the average daily minimum temperature is 35 degrees. The lowest temperature on record, which occurred at Fordyce on January 30, 1966, is -1 degree. In summer the average temperature is 80 degrees, and the average daily maximum temperature is 92 degrees. The highest recorded temperature, which occurred on July 16, 1954, is 107 degrees.

Growing degree days, shown in table 3, 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, 25 inches, or 50 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 20 inches. The heaviest 1-day rainfall during the period of record was 8.19 inches at Fordyce on August 21, 1960. Thunderstorms occur on about 60 days each year, and most occur in summer.

Average seasonal snowfall is 4 inches. The greatest snow depth at any one time during the period of record was 9 inches. On the average, 1 day each winter has at least 1 inch of snow on the ground, but the number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 85 percent. The percentage of possible sunshine is 70 in summer and 50 in winter. The prevailing wind is from the southwest. Average windspeed is highest, 10 miles per hour, in March.

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 then needs to be organized 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 widely in their potential 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. The ratings do not consider location in relation to existing transportation systems or to other kinds of facilities.

Each map unit is rated for *cultivated farm crops, pasture, woodland,* and *urban uses*. Cultivated farm crops include soybeans, grain sorghum, and wheat. Pasture refers to land in improved grasses such as bermudagrass or bahiagrass. Woodland refers to land managed for the production of commercial species such as pine. Urban uses include residential, commercial, and industrial.

The map units in Calhoun and Dallas Counties are described in the following paragraphs.

Calhoun County

1. Amy-Smithton-Pheba

Poorly drained and somewhat poorly drained, level to nearly level, loamy soils on uplands

Areas of these soils are scattered over nearly all of Calhoun County. They are broad flats that are broken by low ridges and are on the Coastal Plain. These soils formed in thick beds of loamy marine sediments.

This map unit occupies about 53 percent of the county. About 35 percent of the unit is Amy soils, 35 percent is Smithton soils, 13 percent is Pheba soils, and the remaining I7 percent is soils of minor extent.

Amy and Smithton soils are slightly lower in the landscape than Pheba soils. Amy and Smithton soils are poorly drained, and Pheba soils are somewhat poorly drained. Amy and Pheba soils have a silt loam surface layer, and Smithton soils have a fine sandy loam surface layer. All three soils have a seasonal high water table.

The minor soils in this unit are the well drained Smithdale, Pikeville, and Ruston soils and the moderately well drained Sawyer, Savannah, and Sacul soils on upland hills; the poorly drained Bonn soils on upland flats; and the poorly drained Guyton soils and the well drained Ouachita soils on flood plains.

These soils are used mainly as woodland. A few small areas of the better drained soils have been cleared and are used mainly as pasture. Wetness is the main limitation for farming and most other purposes.

Where adequately drained, these soils have fair potential for cultivated crops and good potential for pasture. Potential is good for woodland. Harvesting of timber on the poorly drained soils is usually limited to the drier seasons. Because of wetness and low strength, the soils in this unit have poor potential for most urban uses.

2. Guyton

Poorly drained, level, loamy soils on bottom lands

These soils are along the Ouachita River in the western part of Calhoun County and along Moro Creek in the eastern part. They are on frequently flooded bottom lands and formed in deep, loamy alluvial sediments.

This map unit occupies about 29 percent of the county. About 80 percent of the unit is Guyton soils, and the remaining 20 percent is soils of minor extent.

The poorly drained Guyton soils are on broad flats on the flood plains. They have a silt loam surface layer and a seasonal high water table.

The minor soils in this unit are the well drained Ruston soils and the moderately well drained Savannah soils on upland hills, the somewhat poorly drained Pheba soils and the poorly drained Bonn soils on upland flats, and the well drained Ouachita soils in higher positions on the flood plains.

These soils are used mainly as woodland. A few small areas of the better drained soils have been cleared and are used mainly as pasture. Flooding and wetness are the main limitations for farming and most other purposes.

These soils have poor potential for cultivated crops and fair potential for pasture. Potential is good for woodland. Harvesting of timber is usually limited to the drier seasons. Because of flooding and wetness, the soils in this unit have poor potential for most urban uses.

3. Sacul-Smithdale

Moderately well drained and well drained, nearly level to moderately steep, loamy soils on uplands

Areas of these soils are mainly in the northeastern part of Calhoun County. They are on hilltops and hillsides on the Coastal Plain. These soils formed in thick beds of clayey and loamy marine sediments.

This map unit occupies about 7 percent of the county. About 40 percent of the unit is Sacul soils, 25 percent is Smithdale soils, and the remaining 35 percent is soils of minor extent.

The Sacul and Smithdale soils are in similar positions in the landscape. Sacul soils are moderately well drained, and Smithdale soils are well drained. Both soils have a fine sandy loam surface layer. Sacul soils have a clayey subsoil, and Smithdale soils have a loamy subsoil.

The minor soils in this unit are the well drained Ruston soils and the moderately well drained Sawyer and Savannah soils on upland hills; the somewhat poorly drained Pheba soils and the poorly drained Amy and Smithton soils on upland flats; and the well drained Ouachita soils and the poorly drained Guyton soils on bottom lands.

These soils are used mainly as woodland. Some small areas have been cleared and are used mainly as pasture. The erosion hazard is the main limitation for farming.

These soils have fair potential for cultivated crops and good potential for pasture and woodland. Because of high shrink-swell potential, low strength, and slow permeability, Sacul soils have poor potential for most urban uses. Smithdale soils have good potential for most urban uses where slopes are less than 15 percent and fair potential where slopes are more than 15 percent.

4. Savannah-Ruston-Smithdale

Moderately well drained and well drained, nearly level to moderately sloping, loamy soils on uplands

Areas of these soils are scattered over nearly all of Calhoun County. They are on hilltops and hillsides on the Coastal Plain. These soils formed in thick beds of loamy marine sediments.

This map unit occupies about 11 percent of the county. About 60 percent of the unit is Savannah soils, 20 percent is Ruston soils, 10 percent is Smithdale soils, and the remaining 10 percent is soils of minor extent.

Savannah and Smithdale soils are on hillsides, and Ruston soils are on hilltops. Savannah soils are moderately well drained, and Ruston and Smithdale soils are well drained. All three soils have a fine sandy loam surface layer.

The minor soils in this unit are the well drained Pikeville and Briley soils and the moderately well drained Sawyer and Sacul soils on upland hills; the somewhat poorly drained Pheba soils and the poorly drained Amy and Smithton soils on upland flats; and the well drained Ouachita soils and the poorly drained Guyton soils on flood plains.

These soils are used mainly as woodland and pasture. The erosion hazard is the main limitation for farming.

These soils have fair potential for cultivated crops and good potential for pasture and woodland. Savannah soils have fair potential and Ruston and Smithdale soils have good potential for most urban uses.

Dallas County

1. Amy-Smithton-Pheba

Poorly drained and somewhat poorly drained, level to nearly level, loamy soils on uplands

Areas of these soils are scattered over nearly all of Dallas County. They are broad flats that are broken by low ridges and are on the Coastal Plain. These soils formed in thick beds of loamy marine sediments.

This map unit occupies about 22 percent of the county. About 35 percent of the unit is Amy soils, 20 percent is Smithton soils, 20 percent is Pheba soils, and the remaining 25 percent is soils of minor extent.

Amy and Smithton soils are slightly lower in the landscape than Pheba soils. Amy and Smithton soils are poorly drained, and Pheba soils are somewhat poorly drained. Amy and Pheba soils have a silt loam surface layer, and Smithton soils have a fine sandy loam surface layer. All three soils have a seasonal high water table.

The minor soils in this unit are the well drained Smithdale, Pikeville, and Ruston soils and the moderately well drained Sawyer, Savannah, and Sacul soils on upland hills and the poorly drained Guyton soils and the well drained Ouachita soils on flood plains.

These soils are used mainly as woodland. A few small areas of the better drained soils have been cleared and are used mainly as pasture. Wetness is the main limitation for farming and most other purposes.

Where adequately drained, these soils have fair potential for crops and good potential for pasture. Potential is good for woodland. Harvesting of timber on the poorly drained soils is usually limited to the drier seasons. Because of wetness and low strength, the soils in this unit have poor potential for most urban uses.

2. Guyton

Poorly drained, level, loamy soils on bottom lands

These soils are along the Ouachita River in the western part of Dallas County and along Moro Creek and the Saline River in the eastern part. They are on frequently flooded bottom lands and formed in deep, loamy alluvial sediments.

This map unit occupies about 27 percent of the county. About 80 percent of the unit is Guyton soils, and the remaining 20 percent is soils of minor extent.

The poorly drained Guyton soils are on broad flats on the flood plains. They have a silt loam surface layer and a seasonal high water table.

The minor soils in this unit are the well drained Ruston soils, the moderately well drained Savannah soils, and the somewhat poorly drained Pheba soils on uplands and the well drained Ouachita soils in higher positions on the flood plain.

These soils are used mainly as woodland. A few small areas of the better drained soils have been cleared and are used mainly as pasture. Flooding and wetness are the main limitations for farming and most other purposes.

These soils have poor potential for cultivated crops and fair potential for pasture. Potential for woodland is good. Harvesting of timber is usually limited to the drier seasons. Because of flooding and wetness, the soils in this unit have poor potential for most urban uses.

3. Pikeville-Savannah-Smithdale

Well drained and moderately well drained, nearly level to moderately sloping, loamy soils on uplands

Areas of these soils are mainly in the central and western part of Dallas County. They are on hilltops and hillsides on the Coastal Plain. These soils formed in thick beds of loamy and gravelly marine sediments.

This map unit occupies about 24 percent of the county. About 44 percent of the unit is Pikeville soils, 25 percent is Savannah soils, 15 percent is Smithdale soils, and the remaining 16 percent is soils of minor extent.

Pikeville and Smithdale soils are on the higher hilltops and hillsides. Savannah soils are on the lower hillsides. Pikeville and Smithdale soils are well drained, and Savannah soils are moderately well drained. All three soils have a fine sandy loam surface layer.

The minor soils in this unit are the well drained Ruston and Briley soils and the moderately well drained Sawyer and Sacul soils on upland hills; the somewhat poorly drained Pheba soils and the poorly drained Amy and Smithton soils on upland flats; and the poorly drained Guyton soils and the well drained Ouachita soils on flood plains.

These soils are used mainly as woodland and pasture. The erosion hazard is the main limitation for farming.

These soils have fair potential for cultivated crops and good potential for pasture and woodland. Pikeville and Smithdale soils have good potential and Savannah soils have fair potential for most urban uses.

4. Sacul-Sawyer-Smithdale

Moderately well drained and well drained, nearly level to moderately steep, loamy soils on uplands

Areas of these soils are scattered over nearly all of Dallas County. They are on hilltops and hillsides on the Coastal Plain. These soils formed in thick beds of clayey and loamy marine sediments.

This map unit occupies about 27 percent of the county. About 35 percent of the unit is Sacul soils, 14 percent is Sawyer soils, 14 percent is Smithdale soils, and the remaining 37 percent is soils of minor extent.

Sacul and Smithdale soils are in similar positions in the landscape, and Sawyer soils are in less dissected areas. Sacul and Sawyer soils are moderately well drained, and Smithdale soils are well drained. Sacul and Smithdale soils have a fine sandy loam surface layer, and Sawyer soils have a silt loam surface layer.

The minor soils in this unit are the well drained Ruston soils and the moderately well drained Savannah soils on upland hills, the somewhat poorly drained Pheba soils and the poorly drained Amy and Smithton soils on upland flats, and the well drained Ouachita soils and the poorly drained Guyton soils on bottom lands.

These soils are used mainly as woodland. Some small areas have been cleared and are used mainly as pasture. The erosion hazard is the main limitation for farming.

These soils have fair potential for cultivated crops and good potential for pasture and woodland. Because of their high shrink-swell potential, low strength, and slow permeability, Sacul and Sawyer soils have poor potential for most urban uses. Smithdale soils have good potential for most urban uses where slopes are less than 15 percent and fair potential where slopes are more than 15 percent.

Broad land use considerations

In this section, the relative potential of the general soil map units in the survey area is given for each of several broad land uses.

The potential for cultivated crops is fair on units like the Savannah-Ruston-Smithdale unit in Calhoun County and the Pikeville-Savannah-Smithdale unit in Dallas County because of the erosion hazard. Potential is poor on the Guyton unit because of poor drainage and the hazard of flooding.

Most of the map units in the counties have good potential for pasture. Flooding and wetness are limitations for pasture on the Guyton unit.

All map units in the survey area have good potential for woodland. Some units, such as Guyton, have equipment use limitations because of wetness, but such limitations can usually be overcome by using special equipment and by harvesting the trees in the drier seasons. Slope is a moderate limitation to equipment use on the steeper soils of the Sacul-Smithdale unit in Calhoun County and of the Sacul-Sawyer-Smithdale unit in Dallas County.

Most map units in the survey area have some limitations that affect urban development. The Guyton unit is limited by wetness and the hazard of flooding. The Sacul-Smithdale unit in Calhoun County and the Pikeville-Savannah-Smithdale unit in Dallas County are limited by slope. Many of the limitations for urban development can be overcome with proper engineering design.

Soils information is useful as a guide in planning for orderly growth and development in the survey area. Soil-related problems can often be avoided by recognizing the potentials and limitations of the soil before an area is developed for a particular use.

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.

The map units on the detailed soil maps represent 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 similar profiles 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. The Amy series, for example, was named for the town of Amy in adjacent Ouachita County.

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, Sacul fine sandy loam, 1 to 3 percent slopes, is one of several phases within the Sacul 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 pattern and proportion are somewhat similar in all areas. There are no soil complexes in Calhoun and Dallas Counties.

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. Pheba-Savannah association, gently rolling, is an example.

An *undifferentiated group* is made up of two or more soils that could be mapped individually but are mapped as one unit because there is little value in separating them. The pattern and proportion of the soils are not uniform. An area shown on the map has at least one of the dominant (named) soils or may have all of them. Ouachita soils, frequently flooded, is an undifferentiated group in this survey area.

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.

The acreage and proportionate extent of each map unit are given in table 6, 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.

1—Amy silt loam. This poorly drained, level soil is on broad upland flats on the Coastal Plain. Slopes are 0 to 1 percent. Individual areas range from about 20 to 1,000 acres.

Typically, the surface layer is dark grayish brown silt loam about 5 inches thick. The subsurface layer is light gray, mottled silt loam that extends to a depth of about 20 inches. The upper part of the subsoil is gray, mottled silty clay loam that extends to a depth of about 40 inches. The lower part is light brownish gray, mottled silt loam that extends to a depth of about 52 inches. The underlying material is gray, mottled silt loam that extends to a depth of 72 inches or more.

This soil is low in natural fertility. Available water capacity is high. The soil is strongly acid or very strongly acid throughout. Permeability and runoff are slow. The water table is seasonally high; it is within 12 inches of the surface during winter and early spring. Crops on this soil respond well to fertilization, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Guyton, Pheba, Savannah, and Smithton soils.

This Amy soil has fair potential for cultivated crops. Adapted cultivated crops include soybeans and small grains. Because excess surface water is a hazard, farming operations are often delayed several days after a rain unless drainage systems are installed.

Potential for pasture is good. Adapted pasture plants include bermudagrass, bahiagrass, tall fescue, and white clover. Wetness during late winter and early spring is a hazard. During these wet seasons, livestock traffic severely damages pastures and access to supplemental feeding sites is restricted.

Potential is good for loblolly pine and sweetgum. This soil is used mainly for commercial production of these trees. Wetness is a severe limitation to equipment use in managing and harvesting the trees, but this limitation can usually be overcome by logging during the drier seasons.

This soil has poor potential for most urban uses. Wetness is a severe limitation for dwellings, local roads and streets, and small commercial buildings. This limitation can be partly overcome by drainage. Slow permeability and wetness are severe limitations for septic tank absorption fields. These limitations are difficult or impractical to overcome.

This soil is in capability unit IIIw-1 and woodland suitability group 2w9.

2—Bonn silt loam. This poorly drained, level soil is on upland flats on the Coastal Plain. Slopes are 0 to 1 percent. Individual areas range from about 20 to 80 acres.

Typically, the surface layer is grayish brown, mottled silt loam about 3 inches thick. The subsurface layer is light brownish gray silt loam that extends to a depth of about 12 inches. The upper part of the subsoil is grayish brown, mottled silt loam that extends to a depth of about 31 inches. The lower part is light brownish gray, mottled silt loam that extends to a depth of about 60 inches. The underlying material is light brownish gray, mottled silt loam that extends to a depth of 72 inches or more.

This soil is low in natural fertility. Available water capacity is low. Reaction ranges from strongly acid to neutral in the surface layer and from neutral to strongly alkaline in the subsoil and underlying material. Permeability and runoff are slow. The water table is seasonally high; it is within 12 inches of the surface during winter and early spring. This soil contains sodium in amounts that are toxic to plants.

Included with this soil in mapping are a few small areas of Amy soils. Also included, on rounded mounds, are a few areas of soils that are better drained than and not as high in sodium content as the Bonn soil.

Because of the high sodium content, this Bonn soil is not suited to cultivated crops, pasture, and woodland. It is best suited to wildlife habitat, which is the main use. Water quality is very poor in reservoirs constructed on this soil because silt remains suspended in the water.

Potential for most urban uses is poor. Wetness is a severe limitation for dwellings, local roads and streets, and small commercial buildings. This limitation can be partly overcome by drainage. Slow permeability and wetness are severe limitations for septic tank absorption fields. These limitations are difficult or impractical to overcome.

This soil is in capability unit IVs-1. It is not assigned to a woodland suitability group.

3—Briley loamy fine sand, 3 to 8 percent slopes. This well drained, gently sloping soil is on hilltops and hillsides on the Coastal Plain. Individual areas range from about 10 to 80 acres.

Typically, the surface layer is dark grayish brown loamy fine sand about 8 inches thick. The subsurface layer is light yellowish brown loamy fine sand that extends to a depth of about 24 inches. The upper part of the subsoil is yellowish red fine sandy loam that extends to a depth of about 38 inches. The lower part is red sandy clay loam that extends to a depth of 72 inches or more.

This soil is low in natural fertility. Available water capacity is medium to low. The soil is strongly acid or very strongly acid throughout. Permeability is moderate, and runoff is slow. Crops on this soil respond well to fertilization, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Ruston, Savannah, and Smithdale soils.

This Briley soil has poor potential for most cultivated crops. Potential is fair for winter small grains and for truck crops in irrigated areas. Erosion is a severe hazard if cultivated crops are grown, and droughtiness is a hazard during summer. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion.

This soil has fair potential for pasture. Adapted pasture plants include bermudagrass, bahiagrass, and tall fescue. Droughtiness is a hazard during summer.

Potential is good for loblolly pine. This soil is used mainly for commercial production of these trees. The main limitation is a severe hazard of seedling mortality because of droughtiness.

Potential for most urban uses is good. There are no significant limitations for septic tank absorption fields, dwellings, and local roads and streets. Slope is a moderate limitation for small commercial buildings. This limitation can be easily overcome by proper engineering design.

This soil is in capability unit IIIe-1 and woodland suitability group 3s3.

4—Briley loamy fine sand, 8 to 12 percent slopes. This well drained, moderately sloping soil is on hillsides on the Coastal Plain. Individual areas range from about 10 to 60 acres.

Typically, the surface layer is dark grayish brown loamy fine sand about 8 inches thick. The subsurface layer is light yellowish brown loamy fine sand that extends to a depth of about 24 inches. The upper part of the subsoil is yellowish red fine sandy loam that extends to a depth of about 38 inches. The lower part is red sandy clay loam that extends to a depth of 72 inches or more.

This soil is low in natural fertility. Available water capacity is medium to low. The soil is strongly acid or very strongly acid throughout. Permeability is rapid, and runoff is slow. Crops on this soil respond well to fertilization, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Ruston, Savannah, and Smithdale soils.

This Briley soil has poor potential for cultivated crops. Adapted cultivated crops include truck crops and small grain. Erosion is a very severe hazard if cultivated crops are grown, and droughtiness is a severe hazard during summer. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion.

This soil has fair potential for pasture. Adapted pasture plants include bermudagrass, bahiagrass, and tall fescue. Droughtiness is a severe hazard during summer for pasture.

Potential is good for loblolly pine. This soil is used mainly for commercial production of these trees. The main limitation is a severe hazard of seedling mortality because of droughtiness.

Potential for most urban uses is fair. Slope is a moderate limitation for septic tank absorption fields, dwellings, and local roads and streets and a severe limitation for small commercial buildings. These limitations can usually be overcome by proper engineering design.

This soil is in capability unit IVe-2 and woodland suitability group 3s3.

5—Guyton soils, frequently flooded. This map unit consists of level, poorly drained soils on flood plains of local streams on the Coastal Plain. These soils are Guyton silt loam and, in most areas, Guyton soils with variable surface textures. These soils do not occur in a regular pattern on the landscape. Individual areas are large enough to map separately, but because of present and predicted use, they were not separated in mapping. They range from about 20 to 500 acres. Areas are flooded two or three times each year. Slopes are 0 to 1 percent.

Typically, the surface layer is grayish brown, mottled silt loam about 3 inches thick. The subsurface layer is light brownish gray, mottled silt loam that extends to a depth of about 19 inches. The upper part of the subsoil is grayish brown, mottled silty clay loam that extends to a depth of about 38 inches. The lower part is gray, mottled silty clay loam that extends to a depth of about 55 inches. The underlying material is light gray, mottled silty clay loam that extends to a depth of 72 inches or more.

These soils are low in natural fertility. Available water capacity is high. These soils are strongly acid to very strongly acid throughout. Permeability and runoff are slow. The water table is seasonally high, and flooding is frequent during winter and spring.

Included with these soils in mapping are a few small areas of Ouachita soils.

These Guyton soils have poor potential for cultivated crops because of wetness and the hazard of frequent flooding. These limitations can be overcome only by major flood control and by drainage. In most years, the flooding occurs during the period January through June. Adapted cultivated crops include soybeans and grain sorghum.

Potential is fair for pasture. Adapted pasture plants include bermudagrass, bahiagrass, tall fescue, and white clover. The main limitations are wetness and flooding.

These soils have good potential for loblolly pine, sweetgum, green ash, and water oak. These soils are used mainly for commercial production of these trees. Wetness and flooding limit the use of equipment in managing and harvesting the trees, but these limitations can be overcome by using special equipment and by logging during drier seasons.

Potential is poor for urban uses. Wetness and flooding are the main limitations and can be overcome only by major flood control and by drainage.

These soils are in capability unit Vw-1 and woodland suitability group 2w9.

6—Ouachita soils, frequently flooded. This map unit consists of level, well drained soils on flood plains of the Ouachita River and smaller streams on the Coastal Plain. These soils are Ouachita silt loam and, in most areas, Ouachita soils with variable surface and subsoil textures. These soils do not occur in a regular pattern on the landscape. Individual areas are large enough to map separately, but because of present and predicted use, they were not separated in mapping. They range from about 40 to 500 acres. Areas are flooded two or three times each year. Slopes are 0 to 1 percent.

Typically, the surface layer is brown silt loam about 6 inches thick. The subsurface layer is dark yellowish brown silt loam that extends to a depth of about 19 inches. The upper part of the subsoil is yellowish brown silt loam that extends to a depth of about 33 inches. The lower part is yellowish brown, mottled loam that extends to a depth of about 68 inches. The underlying material is yellowish brown, mottled fine sandy loam that extends to a depth of 76 inches or more.

These soils are high in natural fertility. They are strongly acid or very strongly acid throughout. Available water capacity is high. Runoff is slow, and permeability is moderately slow.

Included with these soils in mapping are a few small areas of Guyton, Savannah, and Smithdale soils. Also included are a few small areas of soils that are similar to Ouachita soils except that they have a fine sandy loam subsoil.

These Ouachita soils have poor potential for cultivated crops because of the hazard of frequent flooding. In most years the flooding occurs during the period December through June. This limitation can be overcome only by major flood control.

These soils are used mainly as pasture, woodland, and wildlife. Potential is good for pasture. The main limitation is flooding. Adapted pasture plants include bermudagrass (fig. 1), bahiagrass, tall fescue, and white clover.

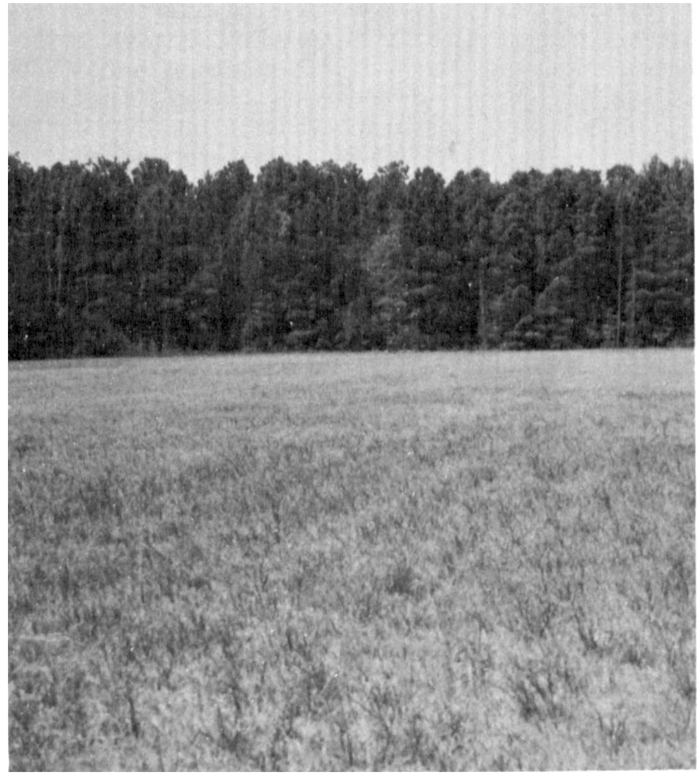


Figure 1.—Common bermudagrass pasture on Ouachita soils, frequently flooded.

These soils have good potential for loblolly pine, sweetgum, and cottonwood. Flooding limits the use of equipment in managing and harvesting the trees, but this limitation can be overcome by logging during the drier seasons.

Potential is poor for urban uses. Flooding is a severe limitation and can be overcome only by major flood control.

These soils are in capability unit IVw-1 and woodland suitability group 1w8.

7—Pheba silt loam, 0 to 2 percent slopes. This somewhat poorly drained, level to nearly level soil is on upland flats on the Coastal Plain. Individual areas range from about 10 to 40 acres.

Typically, the surface layer is dark grayish brown silt loam about 4 inches thick. The subsurface layer is pale brown silt loam that extends to a depth of about 8 inches. The upper part of the subsoil is light yellowish brown, mottled silt loam that extends to a depth of about 22 inches. The next layer is light brownish gray, mottled silt loam that extends to a depth of about 29 inches. The lower part of the subsoil is a compact, brittle fragipan of yellowish brown, mottled silt loam that extends to a depth of 72 inches or more.

This soil is low in natural fertility. Available water capacity is medium. This soil is strongly acid or very strongly acid throughout. Permeability is moderate in the upper part of the subsoil and moderately slow in the fragipan. Runoff is slow. A seasonal high water table is perched above the fragipan during periods of high rainfall. The fragipan restricts root penetration. Crops on this soil respond well to fertilization, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Amy, Guyton, Savannah, and Smithton soils. Also included are areas that contain a few rounded mounds of better drained soils.

This soil has fair potential for cultivated crops. Adapted crops include soybeans, corn, and small grains. Farming operations are commonly delayed a few days after a rain because of excess water, and surface drains are needed.

Potential for pasture is good. Adapted pasture plants include bermudagrass, bahiagrass, and tall fescue. Wetness during late winter and early spring is a limitation. During these wet seasons, livestock traffic damages pastures, and access to supplemental feeding sites is restricted.

Potential is good for loblolly pine and sweetgum. These soils are used mainly for commercial production of these trees. Wetness is a moderate limitation to equipment use in managing and harvesting the trees, but this limitation is usually overcome by logging during the drier seasons.

This soil has poor potential for most urban uses. Wetness is a severe limitation for dwellings and industrial sites. Wetness and low strength are moderate limitations for local roads and streets. These limitations can be partially overcome by drainage and by proper engineering design. Slow permeability and wetness are severe limitations for septic tank absorption fields. These limitations are difficult or impractical to overcome.

This soil is in capability unit IIIw-1 and woodland suitability group 2w8.

8—Pheba-Savannah association, gently rolling. This association consists of somewhat poorly drained and moderately well drained soils in a regular and repeating pattern on upland flats and low ridges in the Coastal Plain. The Pheba soil is mainly on the upland flats, and the Savannah soil is on the ridges. These soils formed in loamy marine sediments. Slopes are 0 to 5 percent. Mapped areas range from about 100 to 1,000 acres.

The somewhat poorly drained Pheba soil makes up about 45 percent of this map unit. Typically, the surface layer is dark grayish brown silt loam about 4 inches thick. The subsurface layer is pale brown silt loam that extends to a depth of about 8 inches. The upper part of the subsoil is light yellowish brown, mottled silt loam that extends to a depth of about 22 inches. The next layer is light brownish gray, mottled silt loam that extends to a depth of about 29 inches. The lower part of the subsoil is a compact, brittle fragipan of yellowish brown, mottled silt loam that extends to a depth of 72 inches or more.

The Pheba soil is low in natural fertility. Available water capacity is medium. The soil is strongly acid or very strongly acid throughout. Permeability is moderate in the upper part of the subsoil and moderately slow in the fragipan. Runoff is slow. A seasonal high water table is perched above the fragipan during periods of high rainfall. The fragipan restricts root penetration. Crops on this soil respond well to fertilization, and tilth is easy to maintain.

The moderately well drained Savannah soil makes up about 40 percent of this map unit. Typically, the surface layer is dark grayish brown fine sandy loam about 4 inches thick. The subsurface layer is pale brown fine sandy loam that extends to a depth of about 9 inches. The upper part of the subsoil is yellowish brown loam that extends to a depth of about 27 inches. Below is a compact and brittle fragipan. The upper part of the fragipan is yellowish brown, mottled loam that extends to a depth of about 37 inches. The middle part is mottled light brownish gray, yellowish brown, and strong brown loam that extends to a depth of about 48 inches. The lower part is mottled reddish brown, strong brown, and yellowish brown sandy loam that extends to a depth of about 59 inches. The next layer is mottled yellowish brown and gray sandy loam that extends to a depth of 72 inches or more.

The Savannah soil is low in natural fertility. Available water capacity is medium. The soil is strongly acid to extremely acid throughout. Permeability is moderate in the upper part of the subsoil and moderately slow in the fragipan. The fragipan restricts root penetration. Crops on this soil respond well to fertilization, and tilth is easy to maintain. Runoff is medium.

Included with these soils in mapping are small areas of Amy, Guyton, Ouachita, Sawyer, and Smithton soils.

These soils have fair potential for cultivated crops. Adapted cultivated crops include soybeans, cotton, truck crops, and small grains. Wetness is a limitation on the Pheba soil, and farming operations are commonly delayed a few days after a rain because of excess water. Surface drainage helps to overcome this limitation. Erosion is a moderate hazard on Savannah soils. Minimum tillage, the use of cover crops, and contour farming help reduce runoff and control erosion.

These soils have good potential for pasture. Adapted pasture plants include bermudagrass, bahiagrass, and tall fescue. Wetness during late winter and early spring is a limitation on the Pheba soil. During these wet seasons, livestock traffic damages pastures, and access to supplemental feeding sites is restricted.

Potential is good for loblolly pine and sweetgum. Commercial production of these trees is the main use of these soils. Wetness is the main limitation on the Pheba soil, and it restricts equipment use in managing and harvesting the trees. This limitation can usually be overcome by logging during the drier seasons. The Savannah soil has no significant limitations for woodland use or management.

These soils have fair to poor potential for urban uses. The Pheba soil is severely limited for dwellings and small commercial buildings by wetness and moderately limited for local roads and streets by wetness and low strength. These limitations can be partially overcome by drainage and by proper engineering design. Slow permeability and wetness are severe limitations for septic tank absorption fields. These limitations are difficult to overcome.

The Savannah soil is moderately limited for dwellings and small commercial buildings by wetness and for local roads and streets by low strength. These limitations can usually be overcome by drainage and by proper engineering design. Moderately slow permeability is a severe limitation for septic tank absorption fields. This limitation is difficult to overcome.

The Pheba soil is in capability unit IIIw-1 and woodland suitability group 2w8. The Savannah soil is in capability unit IIe-1 and woodland suitability group 3o7.

9—Pikeville fine sandy loam, 1 to 3 percent slopes. This well drained, nearly level soil is on hilltops on the Coastal Plain. Individual areas range from about 20 to 200 acres.

Typically, the surface layer is dark brown fine sandy loam about 4 inches thick. The subsurface layer is brown fine sandy loam that extends to a depth of about 15 inches. The upper part of the subsoil is yellowish red loam that extends to a depth of about 28 inches. The middle part is yellowish red gravelly loam that extends to a depth of about 48 inches. The lower part, extending to a depth of 80 inches or more, is stratified yellowish red very gravelly fine sandy loam and strong brown very gravelly loamy sand.

This soil is low in natural fertility. Available water capacity is medium. The soil is strongly acid or very strongly acid throughout. Permeability is moderate, and runoff is medium. Crops on this soil respond well to fertilization, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Briley, Ruston, Sacul, Savannah, and Smithdale soils. Also included are a few small areas that have been mined for gravel (fig. 2) and areas of soils that are similar to Pikeville soils except that they are gravelly in the upper part of the subsoil.

This Pikeville soil has fair potential for cultivated crops. Adapted cultivated crops include truck crops, cotton, soybeans, corn, and small grains. Erosion is a moderate hazard if cultivated crops are grown. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion.

Potential for pasture is good. Adapted pasture plants include bermudagrass, bahiagrass, and tall fescue.

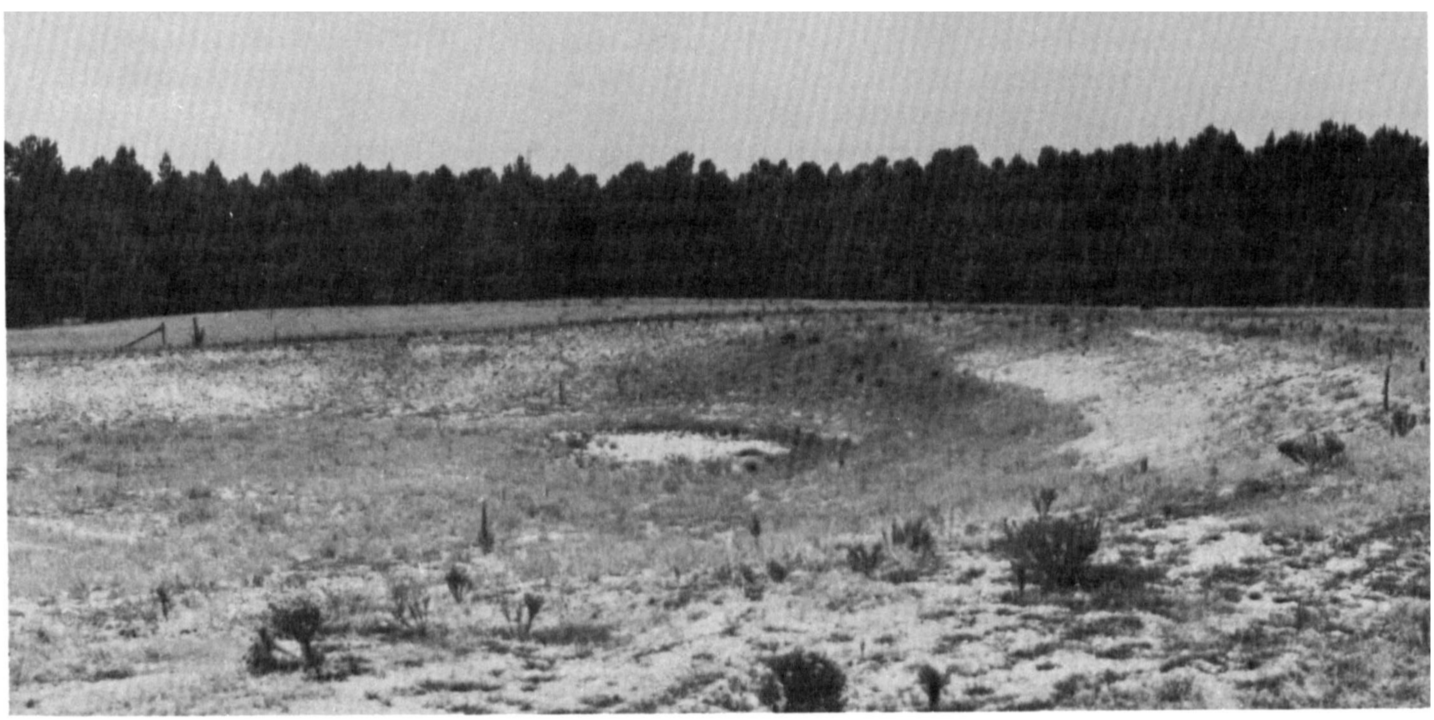


Figure 2.—Abandoned gravel pit that has been shaped and seeded to bermudagrass on Pikeville fine sandy loam, 1 to 3 percent slopes.

Potential is good for loblolly pine. This soil is used mainly for commercial production of these trees. There are no significant limitations for woodland use or management.

This soil has good potential for most urban uses. There are no significant limitations for dwellings, industrial sites, and septic tank absorption fields. Low strength is a moderate limitation for local roads and streets. This limitation can be overcome by proper engineering design.

This soil is in capability unit IIe-1 and woodland suitability group 3o1.

10—Pikeville fine sandy loam, 3 to 8 percent slopes. This well drained, gently sloping soil is on hilltops and hillsides on the Coastal Plain. Individual areas range from about 20 to 200 acres.

Typically, the surface layer is dark brown fine sandy loam about 4 inches thick. The subsurface layer is brown fine sandy loam that extends to a depth of about 15 inches. The upper part of the subsoil is yellowish red loam that extends to a depth of about 28 inches. The middle part is yellowish red gravelly loam that extends to a depth of about 48 inches. The lower part, extending to a depth of 80 inches or more, is stratified yellowish red very gravelly fine sandy loam and strong brown very gravelly loamy sand.

This soil is low in natural fertility. Available water capacity is medium. The soil is strongly acid or very strongly acid throughout. Permeability is moderate, and runoff is medium. Crops on this soil respond well to fertilization, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Briley, Ruston, Sacul, Savannah, and Smithdale soils, and small areas that have been mined for gravel. Also included are a few small areas of soils with slopes of less than 3 percent or of more than 8 percent and small areas of soils that are similar to Pikeville soils except that they are gravelly in the upper part of the subsoil.

This Pikeville soil has fair potential for cultivated crops. Adapted cultivated crops include truck crops, cotton, soybeans, corn, and small grains. Erosion is a severe hazard if cultivated crops are grown. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion.

Potential for pasture is good. Adapted pasture plants include bermudagrass, bahiagrass, and tall fescue.

This soil has good potential for loblolly pine. It is used mainly for commercial production of these trees. There are no significant limitations for woodland use or management.

This soil has good potential for most urban uses. There are no significant limitations for dwellings and septic tank absorption fields. Slope is a moderate limitation for industrial sites, and low strength is a moderate limitation for local roads and streets. These limitations can be easily overcome with proper engineering design.

This soil is in capability unit IIIe-1 and woodland suitability group 3o1.

11—Pikeville fine sandy loam, 8 to 12 percent slopes. This well drained, moderately sloping soil is on hillsides on the Coastal Plain. Individual areas range from about 20 to 100 acres.

Typically, the surface layer is dark brown fine sandy loam about 4 inches thick. The subsurface layer is brown fine sandy loam that extends to a depth of about 15 inches. The upper part of the subsoil is yellowish red loam that extends to a depth of about 28 inches. The middle part is yellowish red gravelly loam that extends to a depth of about 48 inches. The lower part, extending to a depth of 80 inches or more, is stratified yellowish red very gravelly fine sandy loam and strong brown very gravelly loamy sand.

This soil is low in natural fertility. Available water capacity is medium. The soil is strongly acid or very strongly acid throughout except for the surface layer in limed areas. Permeability is moderate, and runoff is medium. Crops on this soil respond well to fertilization, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Briley, Ruston, Sacul, Savannah, and Smithdale soils. Also included are a few small areas of soils with slopes of less than 8 percent and small areas of soils that are similar to Pikeville soils except that they are gravelly in the upper part of the subsoil.

This Pikeville soil has poor potential for most cultivated crops. Adapted cultivated crops include truck crops and small grains. Erosion is a very severe hazard if cultivated crops are grown. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion.

Potential for pasture is good. Adapted pasture plants include bermudagrass, bahiagrass, and tall fescue.

This soil has good potential for loblolly pine. It is used mainly for commercial production of these trees. There are no significant limitations for woodland use or management.

This soil has fair potential for most urban uses. Slope is a moderate limitation for dwellings and septic tank absorption fields. Slope and low strength are moderate limitations for local roads and streets, and slope is a severe limitation for industrial sites. These limitations can usually be overcome with proper engineering design.

This soil is in capability unit IVe-2 and woodland suitability group 3o1.

12—Pikeville association, gently rolling. This association consists of well drained soils in a regular and repeating pattern. The landscape is mainly low hills with narrow tops, gently sloping side slopes, and narrow drainageways. The Pikeville soils are mainly on the hilltops and side slopes, and the minor soils are on the foot slopes and in the narrow drainageways. These soils formed in gravelly and loamy marine deposits. Slope ranges from 1 to 8 percent. Mapped areas range from about 100 to 1,500 acres.

The Pikeville soils make up about 70 percent of this map unit. Typically, the surface layer is dark brown fine sandy loam about 4 inches thick. The subsurface layer is brown fine sandy loam that extends to a depth of about 15 inches. The upper part of the subsoil is yellowish red loam that extends to a depth of about 28 inches. The middle part is yellowish red gravelly loam that extends to a depth of about 48 inches. The lower part, extending to a depth of 80 inches or more, is stratified yellowish red very gravelly fine sandy loam and strong brown very gravelly loamy sand.

The Pikeville soils are low in natural fertility. Available water capacity is medium. These soils are strongly acid or very strongly acid throughout. Permeability is moderate, and runoff is medium. Crops on these soils respond well to fertilization, and tilth is easy to maintain.

Included with these soils in mapping are small areas of Briley, Ruston, Sacul, Savannah, and Smithdale soils. Also included are small areas of soils that are similar to Pikeville soils except that they are gravelly in the upper part of the subsoil. A few small areas that have been mined for gravel are also included.

These Pikeville soils have fair potential for cultivated crops. Adapted cultivated crops include truck crops, cotton, soybeans, corn, and small grains. Erosion is a severe hazard if cultivated crops are grown. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion.

Potential for pasture is good. Adapted pasture plants include bermudagrass, bahiagrass, and tall fescue.

These soils have good potential for loblolly pine. They are used mainly for commercial production of these trees. There are no significant limitations for woodland use or management.

Potential is good for most urban uses. There are no significant limitations for dwellings and septic tank absorption fields. Low strength is a moderate limitation for local roads and streets. Slope is a moderate limitation for industrial sites where slopes are more than 4 percent. These limitations can usually be overcome with proper engineering design.

These soils are in capability unit IIIe-1 and woodland suitability group 3o1.

13—Pikeville association, rolling. This association consists of well drained soils in a regular and repeating pattern. The landscape is mainly hills with narrow tops, moderately sloping and moderately steep side slopes, and narrow drainageways. The Pikeville soils are mainly on the hilltops and side slopes, and the minor soils are on the foot slopes and in the narrow drainageways. These soils formed in gravelly and loamy marine deposits. Slope ranges from 8 to 20 percent. Mapped areas range from about 100 to 1,500 acres.

The Pikeville soils make up about 70 percent of this map unit. Typically, the surface layer is dark brown fine sandy loam about 4 inches thick. The subsurface layer is brown fine sandy loam that extends to a depth of about 15 inches. The upper part of the subsoil is yellowish red loam that extends to a depth of about 28 inches. The middle part is yellowish red gravelly loam that extends to a depth of about 48 inches. The lower part, extending to a depth of 80 inches or more, is stratified yellowish red very gravelly fine sandy loam and strong brown very gravelly loamy sand.

The Pikeville soils are low in natural fertility. Available water capacity is medium. These soils are strongly acid or very strongly acid throughout. Permeability is moderate, and runoff is medium.

Included with these soils in mapping are small areas of Briley, Ruston, Sacul, Savannah, and Smithdale soils. Also included are small areas of soils that are similar to Pikeville soils except that they are gravelly in the upper part of the subsoil. A few small areas that have been mined for gravel are also included.

These Pikeville soils have poor potential for cultivated crops and fair to good potential for pasture. Adapted pasture plants include bermudagrass, bahiagrass, and tall fescue. Erosion is a very severe hazard where pasture is being established.

Potential is good for loblolly pine. These soils are used mainly for commercial production of these trees. There are no significant limitations for woodland use or management.

These soils have fair to poor potential for most urban uses. Slope is a moderate limitation for dwellings, local roads and streets, and septic tank absorption fields. Slope is a severe limitation for industrial sites. These limitations can usually be overcome with proper engineering design.

These soils are in capability unit VIe-2 and woodland suitability group 3o1.

14—Ruston fine sandy loam, 1 to 3 percent slopes. This well drained, nearly level soil is on hilltops on the Coastal Plain. Individual areas range from about 20 to 200 acres.

Typically, the surface layer is dark brown fine sandy loam about 6 inches thick. The subsurface layer is light yellowish brown fine sandy loam that extends to a depth of about 15 inches. The upper part of the subsoil is reddish brown fine sandy loam that extends to a depth of about 29 inches. The next part is yellowish red fine sandy loam that extends to a depth of about 41 inches. The lower part is yellowish red, mottled fine sandy loam that extends to a depth of about 55 inches. The next layer is yellowish red and light yellowish brown sand that extends to a depth of about 65 inches. The next layer, extending to a depth of 80 inches or more, is yellowish red sandy loam.

This soil is moderate to low in natural fertility. Available water capacity is medium. The soil is strongly acid or very strongly acid throughout. Permeability is moderate, and runoff is medium. Crops on this soil respond well to fertilization, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Briley, Sacul, Savannah, and Smithdale soils. Also included are small areas of soils that have slopes of more than 3 percent.

This Ruston soil has good potential for cultivated crops. The main crops are soybeans and truck crops. Other adapted crops include corn, cotton, and small grains. Erosion is a moderate hazard if cultivated crops are grown. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion.

Potential for pasture is good. Adapted pasture plants include bermudagrass, bahiagrass, and tall fescue.

This soil has good potential for loblolly pine. It is used mainly for commercial production of these trees. There are no significant limitations for woodland use or management.

Potential is good for most urban uses. There are no significant limitations for septic tank absorption fields, dwellings, and industrial sites. Low strength is a moderate limitation for local roads and streets. This limitation can be easily overcome with proper engineering design.

This soil is in capability unit IIe-1 and woodland suitability group 3o1.

15—Sacul fine sandy loam, 1 to 3 percent slopes. This moderately well drained, nearly level soil is on hilltops on the Coastal Plain. Individual areas are about 10 to 40 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 4 inches thick. The subsurface layer is pale brown fine sandy loam that extends to a depth of about 8 inches. The upper part of the subsoil is red clay that extends to a depth of about 18 inches. The next part is red, mottled clay that extends to a depth of about 27 inches. The next part is mottled light brownish gray, red, and yellowish red clay and clay loam that extends to a depth of about 47 inches. The next part is mottled light brownish gray, yellowish brown, and yellowish red clay loam that extends to a depth of about 56 inches. The underlying material is light brownish gray, mottled clay loam that contains layers of brown silt loam and that extends to a depth of 72 inches or more.

This soil is low in natural fertility. Available water capacity is medium. The soil is strongly acid or very strongly acid throughout. Permeability is slow, and runoff is medium. Crops on this soil respond well to fertilization, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Ruston, Savannah, Sawyer, and Smithdale soils. Also included are small areas of soils with slopes of more than 3 percent and small areas of soils that are similar to Sacul soils except that they have sandy clay and sandy clay loam in the subsoil.

This Sacul soil has fair potential for cultivated crops. Adapted cultivated crops include soybeans, corn, and small grains. Erosion is a severe hazard if cultivated crops are grown. Minimum tillage, contour farming, and the use of cover crops help to reduce runoff and control erosion. Farming operations are commonly delayed a few days after a rain because of poor internal drainage.

Potential for pasture is good. Adapted pasture plants include bermudagrass and bahiagrass.

Potential is good for loblolly pine (fig. 3). This soil is used mainly for commercial production of these trees. The erosion hazard is the main concern in woodland management.

This soil has poor potential for most urban uses. Low strength and high shrink-swell potential are severe limitations for local roads and streets, dwellings, and industrial sites. Slow permeability is a severe limitation for septic tank absorption fields. These limitations are difficult or impractical to overcome.

This soil is in capability unit IIIe-2 and woodland suitability group 3c2.

16—Sacul fine sandy loam, 3 to 8 percent slopes. This moderately well drained, gently sloping soil is on hilltops and hillsides on the Coastal Plain. Individual areas are about 10 to 400 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 4 inches thick. The subsurface layer is pale brown fine sandy loam that extends to a depth of about 8 inches. The upper part of the subsoil is red clay that extends to a depth of 18 inches. The next part is red, mottled clay that extends to a depth of about 27 inches. The next part is mottled light brownish gray, red, and yellowish red clay and clay loam that extends to a depth of about 47 inches. The next part is mottled light brownish gray, yellowish brown, and yellowish red clay loam that extends to a depth of about 56 inches. The underlying material is light brownish gray, mottled clay loam that contains layers of brown silt loam and extends to a depth of 72 inches or more.

This soil is low in natural fertility. Available water capacity is medium. The soil is strongly acid or very strongly acid throughout. Permeability is slow, and runoff is rapid. Crops on this soil respond well to fertilization, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Ruston, Savannah, Sawyer, and Smithdale soils. Also included are small areas of soils with slopes of more than 8 percent and small areas of soils that are similar to Sacul soils except that they have sandy clay and sandy clay loam in the subsoil.

This Sacul soil has poor potential for cultivated crops. Erosion is a very severe hazard if cultivated crops are

Figure 3.—Plantation of loblolly pine on Sacul fine sandy loam, 1 to 3 percent slopes. The site index for loblolly pine is 80 on this soil.

grown. Minimum tillage, contour farming, and the use of cover crops help to reduce runoff and control erosion.

Potential for pasture is good. Adapted pasture plants include bermudagrass and bahiagrass.

Potential is fair for loblolly pine. This soil is used mainly for commercial production of these trees. The erosion hazard is the main concern in woodland management.

Potential is poor for most urban uses. Low strength and high shrink-swell potential are severe limitations for local roads and streets, dwellings, and industrial sites. Slow permeability is a severe limitation for septic tank absorption fields. These limitations are difficult or impractical to overcome.

This soil is in capability unit IVe-1 and woodland suitability group 3c2.

17—Sacul fine sandy loam, 8 to 12 percent slopes. This moderately well drained, moderately sloping soil is on hillsides on the Coastal Plain. Individual areas are about 10 to 100 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 4 inches thick. The subsurface layer is pale brown fine sandy loam that extends to a depth of about 8 inches. The upper part of the subsoil is red clay that extends to a depth of about 18 inches. The next part is red, mottled clay that extends to a depth of about 27 inches. The next part is mottled light brownish gray, red, and reddish brown clay and clay loam that extends to a depth of about 47 inches. The next part is mottled light brownish gray, yellowish brown, and yellowish red clay loam that extends to a depth of about 56 inches. The underlying material is light brownish gray, mottled clay loam that contains layers of brown silt loam and that extends to a depth of 72 inches or more.

This soil is low in natural fertility. Available water capacity is medium. The soil is strongly acid or very strongly acid throughout. Permeability is slow, and runoff is rapid. Crops on this soil respond well to fertilization, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Briley, Savannah, Sawyer, and Smithdale soils. Also included are small areas of soils with slopes of more than 12 percent and small areas of soils that are similar to Sacul soils except that they have sandy clay and sandy clay loam in the subsoil.

This Sacul soil has poor potential for cultivated crops and fair potential for pasture. Adapted pasture plants include bermudagrass and bahiagrass. Erosion is a very severe hazard when this soil is tilled for establishment of pasture plants.

Potential is fair for loblolly pine. This soil is used mainly for commercial production of these trees. The erosion hazard is the main concern in woodland management.

Potential is poor for most urban uses. Low strength and high shrink-swell potential are severe limitations for local roads and streets and for dwellings. Low strength, high shrink-swell potential, and slope are severe limitations for industrial sites. Slow permeability is a severe limitation for septic tank absorption fields. These limitations are difficult or impractical to overcome.

This soil is in capability unit VIe-1 and woodland suitability group 3c2.

18—Sacul association, rolling. This association consists of moderately well drained soils in a regular and repeating pattern. The landscape is mainly low hills with narrow tops, moderately sloping to moderately steep side slopes, and narrow drainageways. The Sacul soils are mainly on the side slopes, and minor soils are mainly on the ridgetops and in the drainageways. They formed in stratified loamy and clayey marine sediments. Slopes are 8 to 15 percent. Mapped areas range from about 100 to 1,500 acres.

The Sacul soils make up about 75 percent of this map unit. Typically, the surface layer is dark grayish brown fine sandy loam about 4 inches thick. The subsurface layer is pale brown fine sandy loam that extends to a depth of about 8 inches. The upper part of the subsoil is red clay that extends to a depth of about 18 inches. The next part is red, mottled clay that extends to a depth of about 27 inches. The next part is mottled light brownish gray, red, and reddish brown clay and clay loam that extends to a depth of about 47 inches. The next part is mottled light brownish gray, yellowish brown, and yellowish red clay loam that extends to a depth of about 56 inches. The underlying material is light brownish gray, mottled clay loam that contains layers of brown silt loam and that extends to a depth of 72 inches or more.

Sacul soils are low in natural fertility. Available water capacity is medium. The soils are strongly acid or very strongly acid throughout. Permeability is slow, and runoff is rapid. Crops on this soil respond well to fertilization, and tilth is easy to maintain.

Included with these soils in mapping are small areas of Sawyer soils on narrow ridgetops. The rest of the association is small areas of Amy, Briley, Pikeville, Ruston, Savannah, and Smithdale soils.

These Sacul soils have poor potential for cultivated crops and fair potential for pasture. Adapted pasture plants include bermudagrass and bahiagrass. The erosion is a very severe hazard when these soils are tilled for establishment of pasture plants.

These soils are mainly woodland. Potential is good for loblolly pine. The erosion hazard is the main concern in woodland management.

These soils have poor potential for most urban uses. Low strength and high shrink-swell potential are severe limitations for dwellings and local roads and streets. Low strength, high shrink-swell potential, and slope are severe limitations for industrial sites. Slow permeability is a severe limitation for septic tank absorption fields. These limitations are difficult or impractical to overcome.

These soils are in capability unit VIe-2 and woodland suitability group 3c2.

19—Sacul-Sawyer association, gently rolling. This association consists of moderately well drained soils in a regular and repeating pattern. The landscape is mainly low hills with narrow tops, gently sloping side slopes, and narrow drainageways. The Sacul soil is mainly on the side slopes, and the Sawyer soil is mainly on the hilltops. Both of these soils formed in stratified loamy and clayey marine sediments. Slopes are 0 to 8 percent. Mapped areas range from about 100 to 1,500 acres.

The Sacul soil makes up about 40 percent of this map unit. Typically, the surface layer is dark grayish brown fine sandy loam about 4 inches thick. The subsurface layer is pale brown fine sandy loam that extends to a depth of about 8 inches. The upper part of the subsoil is red clay that extends to a depth of about 18 inches. The next part is red, mottled clay that extends to a depth of about 27 inches. The next part is mottled light brownish gray, red, and reddish brown clay and clay loam that extends to a depth of about 47 inches. The next part is mottled light brownish gray, yellowish brown, and yellowish red clay loam that extends to a depth of about 56 inches. The underlying material is light brownish gray, mottled clay loam that contains layers of brown silt loam and that extends to a depth of 72 inches or more.

The Sacul soil is low in natural fertility. Available water capacity is medium. Reaction is strongly acid or very strongly acid throughout. Permeability is slow, and runoff is medium to rapid. Crops on this soil respond well to fertilization, and tilth is easy to maintain.

The Sawyer soil makes up about 35 percent of this map unit. Typically, the surface layer is dark grayish brown silt loam about 4 inches thick. The upper part of the subsoil is yellowish brown silt loam that extends to a depth of about 20 inches. The next part is yellowish brown, mottled silty clay loam that extends to a depth of about 30 inches. The next part is mottled gray, red, and strong brown silty clay that extends to a depth of about 52 inches. The lower part of the subsoil is gray, mottled clay that extends to a depth of 80 inches or more.

The Sawyer soil is low in natural fertility. Available water capacity is high. Reaction is strongly acid to extremely acid throughout. Permeability is slow, and runoff is medium. Crops on this soil respond well to fertilization, and tilth is easy to maintain.

Included with these Sacul and Sawyer soils in mapping are small areas of Amy, Guyton, Pheba, Pikeville, Ruston, Savannah, Smithdale, and Smithton soils.

These Sacul and Sawyer soils have fair potential for cultivated crops. Adapted cultivated crops include truck crops, cotton, corn, and small grains. Erosion is a severe hazard if cultivated crops are grown. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion.

Potential for pasture is good. Adpated pasture plants include bermudagrass, bahiagrass, and tall fescue.

These soils are mainly woodland. Potential is good for loblolly pine. Wetness is a moderate limitation to equipment use in managing and harvesting the trees, but this limitation is usually overcome by logging during the dry seasons. The moderate erosion hazard is also a management concern.

Potential is poor for most urban uses. Low strength, high shrink-swell potential, and wetness are severe limitations for dwellings, industrial sites, and local roads and streets. Slow permeability is a severe limitation for septic tank absorption fields. These limitations are difficult or impractical to overcome.

The Sacul soil is in capability unit IVe-1 and woodland suitability group 3c2. The Sawyer soil is in capability unit IIIe-1 and woodland suitability group 2w8.

20—Sacul-Smithdale association, gently rolling. This association consists of moderately well drained and well drained soils in a regular and repeating pattern. The landscape is mainly low hills with narrow tops, gently sloping side slopes, and narrow drainageways. The Sacul soil is mainly on the foot slopes and lower side slopes, and the Smithdale soil is mainly on the hilltops and upper side slopes. The Sacul soil formed in stratified loamy and clayey marine sediments, and the Smithdale soil formed in loamy marine sediments. Slopes are 1 to 8 percent. Mapped areas range from about 100 to 2,000 acres.

The moderately well drained Sacul soil makes up about 45 percent of this map unit. Typically, the surface layer is dark grayish brown fine sandy loam about 4 inches thick. The subsurface layer is pale brown fine sandy loam that extends to a depth of about 8 inches. The upper part of the subsoil is red clay that extends to a depth of about 18 inches. The next part is red, mottled clay that extends to a depth of about 27 inches. The next part is mottled light brownish gray, red, and yellowish red clay and clay loam that extends to a depth of about 47 inches. The next part is mottled light brownish gray, yellowish brown, and yellowish red clay loam that extends to a depth of about 56 inches. The underlying material is light brownish gray, mottled clay loam that contains layers of brown silt loam and that extends to a depth of 72 inches or more.

The Sacul soil is low in natural fertility. Available water capacity is medium. Reaction is strongly acid or very strongly acid throughout. Permeability is slow, and runoff is medium to rapid. Crops on this soil respond well to fertilization, and tilth is easy to maintain.

The well drained Smithdale soil makes up about 40 percent of this map unit. Typically, the surface layer is dark brown fine sandy loam about 8 inches thick. The subsurface layer is pale brown fine sandy loam that extends to a depth of about 16 inches. The upper part of the subsoil is red sandy clay loam that extends to a depth of about 32 inches. The middle part is red loam that extends to a depth of about 48 inches. The lower part is red sandy loam that extends to a depth of 80 inches or more.

The Smithdale soil is low in natural fertility. Available water capacity is high. Reaction is strongly acid or very strongly acid throughout. Permeability is moderate, and runoff is medium. Crops on this soil respond well to fertilization, and tilth is easy to maintain.

Included with these Sacul and Smithdale soils in mapping are small areas of Briley, Ruston, Savannah, and Sawyer soils.

These Sacul and Smithdale soils have fair potential for cultivated crops. Adapted cultivated crops include soybeans, truck crops, cotton, corn, and small grains. Erosion is a severe hazard if cultivated crops are grown. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion.

Potential for pasture is good. Adapted pasture plants include bermudagrass, bahiagrass, and tall fescue.

These soils are mainly woodland. Potential is good for loblolly pine. The erosion hazard is the main concern in woodland management.

The Sacul soil has poor potential for most urban uses. Low strength and high shrink-swell potential are severe limitations for dwellings, industrial sites, and local roads and streets. Slow permeability is a severe limitation for septic tank absorption fields. These limitations are difficult or impractical to overcome.

The Smithdale soil has good potential for most urban uses. There are no significant limitations for septic tank absorption fields, dwellings, and local roads and streets. Slope is a moderate limitation for industrial sites. This limitation can be easily overcome.

The Sacul soil is in capability unit IVe-1 and woodland suitability group 3c2. The Smithdale soil is in capability unit IIIe-1 and woodland suitability group 3o1.

21—Savannah fine sandy loam, 1 to 3 percent slopes. This moderately well drained, nearly level soil is on hilltops and low ridges on the Coastal Plain. Individual areas are about 10 to 300 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 4 inches thick. The subsurface layer is pale brown fine sandy loam that extends to a depth of about 9 inches. The upper part of the subsoil is yellowish brown loam that extends to a depth of about 27 inches. Below is a compact and brittle fragipan. The upper part of the fragipan is yellowish brown, mottled loam that extends to a depth of about 37 inches. The middle part is mottled light brownish gray, yellowish brown, and strong brown loam that extends to a depth of about 48 inches. The lower part is mottled reddish brown, strong brown, and yellowish brown sandy loam that extends to a depth of about 59 inches. The next layer is mottled yellowish brown and gray sandy loam that contains pockets of brown loamy sand and that extends to a depth of 72 inches or more.

This soil is low in natural fertility. Available water capacity is medium. Reaction ranges from strongly acid to extremely acid throughout. Permeability is moderate in the upper part of the subsoil and moderately slow in the fragipan. Runoff is medium. Crops on this soil respond well to fertilization, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Amy, Briley, Pheba, Ruston, Sawyer, and Smithton soils. Also included are small areas of soils with slopes of more than 3 percent and small areas of soils that are similar to Savannah soils except that they do not have the compact and brittle layer in the subsoil.

This Savannah soil has good potential for cultivated crops. Adapted cultivated crops include truck crops, soybeans, cotton, corn, and small grains. Erosion is a moderate hazard if cultivated crops are grown. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion.

Potential for pasture is good. Adapted pasture plants include bermudagrass, bahiagrass, and tall fescue.

Potential is good for loblolly pine and southern red oak. This soil is used mainly for commercial production of these trees. There are no significant limitations for woodland use and management.

This soil has fair potential for most urban uses. Wetness is a moderate limitation for dwellings and industrial sites. Low strength is a moderate limitation for local roads and streets. These limitations can usually be overcome with proper engineering design. Moderately slow permeability is a severe limitation for septic tank absorption fields. This limitation is difficult to overcome.

This soil is in capability unit IIe-1 and woodland suitability group 3o7.

22—Savannah fine sandy loam, 3 to 8 percent slopes. This moderately well drained, gently sloping soil is on hilltops and hillsides on the Coastal Plain. Individual areas are about 20 to 400 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 4 inches thick. The subsurface layer is pale brown fine sandy loam that extends to a depth of about 9 inches. The upper part of the subsoil is yellowish brown loam that extends to a depth of about 27 inches. Below is a compact and brittle fragipan. The upper part of the fragipan is yellowish brown, mottled loam that extends to a depth of about 37 inches. The middle part is mottled light brownish gray, yellowish brown, and strong brown loam that extends to a depth of about 48 inches. The lower part is mottled reddish brown, strong brown, and yellowish brown sandy loam that extends to a depth of about 59 inches. The next layer is mottled yellowish brown and gray sandy loam that contains pockets of brown loamy sand and that extends to a depth of 72 inches or more.

This soil is low in natural fertility. Available water capacity is medium. Reaction ranges from strongly acid to extremely acid throughout. Permeability is moderate in the upper part of the subsoil and moderately slow in the fragipan. Runoff is medium. Crops on the soil respond well to fertilization, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Amy, Briley, Pheba, Sawyer, Smithdale, and Smithton soils. Also included are small areas of soils with slopes of less than 3 percent and small areas of soils that are similar to Savannah soils except that they do not have the compact and brittle layer in the subsoil.

This Savannah soil has fair to good potential for cultivated crops. Adapted cultivated crops include truck crops, soybeans, cotton, corn, and small grains. Erosion is a severe hazard if cultivated crops are grown. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion.

Figure 4.—Pensacola bahiagrass pasture in foreground and stock pond in background on Savannah fine sandy loam, 3 to 8 percent slopes.

Potential for pasture is good. Adapted pasture plants include bermudagrass, bahiagrass (fig. 4), and tall fescue.

Potential is good for loblolly pine and southern red oak. This soil is used mainly for commercial production of these trees. There are no significant limitations for woodland use and management.

This soil has fair potential for most urban uses. Wetness is a moderate limitation for dwellings. Wetness and slope are moderate limitations for industrial sites. Low strength is a moderate limitation for local roads and streets. These limitations can usually be overcome with proper engineering design. Moderately slow permeability is a severe limitation for septic tank absorption fields. This limitation is difficult to overcome.

This soil is in capability unit IIIe-1 and woodland suitability group 3o7.

23—Sawyer silt loam, 1 to 3 percent slopes. This moderately well drained, nearly level soil is on hilltops on the Coastal Plain. Individual areas are about 10 to 200 acres.

Typically, the surface layer is dark grayish brown silt loam about 4 inches thick. The upper part of the subsoil is yellowish brown silt loam that extends to a depth of about 20 inches. The next part is yellowish brown, mottled silty clay loam that extends to a depth of about 30 inches. The next part is mottled gray, red, and strong brown silty clay that extends to a depth of about 52 inches. The lower part of the subsoil is gray, mottled clay that extends to a depth of 80 inches or more.

This soil is low in natural fertility. Available water capacity is high. Reaction is strongly acid to extremely acid throughout. Permeability is slow, and runoff is medium. Crops on the soil respond well to fertilization, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Pheba, Sacul, and Savannah soils and a few small areas of soils that have a fine sandy loam surface layer.

This Sawyer soil has fair potential for cultivated crops. Adapted cultivated crops include truck crops, soybeans, cotton, corn, and small grains. Erosion is a moderate hazard if cultivated crops are grown. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion.

Potential for pasture is good. Adapted pasture plants include bermudagrass, bahiagrass, and tall fescue.

Potential is good for loblolly pine. This soil is used mainly for commercial production of these trees. Wetness is a moderate limitation to equipment use in managing and harvesting the trees, but this limitation is usually overcome by logging during the dry seasons.

This soil has poor potential for most urban uses. Low strength and high shrink-swell potential are severe limitations for dwellings and local roads and streets. Low strength, high shrink-swell potential, and wetness are severe limitations for industrial sites. Slow permeability is a severe limitation for septic tank absorption fields. These limitations are difficult or impractical to overcome.

This soil is in capability unit IIe-1 and woodland suitability group 2w8.

24—Sawyer silt loam, 3 to 8 percent slopes. This moderately well drained, gently sloping soil is on hilltops and hillsides on the Coastal Plain. Individual areas range from about 10 to 100 acres.

Typically, the surface layer is dark grayish brown silt loam about 4 inches thick. The upper part of the subsoil is yellowish brown silt loam that extends to a depth of about 20 inches. The next part is yellowish brown, mottled silty clay loam that extends to a depth of about 30 inches. The next part is mottled gray, red, and strong brown silty clay that extends to a depth of about 52 inches. The lower part of the subsoil is gray, mottled clay that extends to a depth of 80 inches or more.

This soil is low in natural fertility. Available water capacity is high. Reaction is strongly acid to extremely acid throughout. Permeability is slow, and runoff is medium. Crops on the soil respond well to fertilization, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Pheba, Sacul, and Savannah soils and a few small areas of soils that have a fine sandy loam surface layer.

This Sawyer soil has fair potential for cultivated crops. Adapted cultivated crops include truck crops, soybeans, cotton, corn, and small grains. Erosion is a severe hazard if cultivated crops are grown. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion.

Potential for pasture is good. Adapted pasture plants include bermudagrass, bahiagrass, and tall fescue.

Potential is good for loblolly pine. This soil is used mainly for commercial production of these trees. Wetness is a moderate limitation to equipment use in managing and harvesting the trees, but this limitation is usually overcome by logging during the dry seasons.

This soil has poor potential for most urban uses. Low strength and high shrink-swell potential are severe limitations for dwellings and local roads and streets. Low strength, high shrink-swell potential, and wetness are severe limitations for industrial sites. Slow permeability is a severe limitation for septic tank absorption fields. These limitations are difficult or impractical to overcome.

This soil is in capability unit IIIe-1 and woodland suitability group 2w8.

25—Smithdale fine sandy loam, 3 to 8 percent slopes. This well drained, gently sloping soil is on uplands on the Coastal Plain. Individual areas range from about 10 to 500 acres.

Typically, the surface layer is dark brown fine sandy loam about 8 inches thick. The subsurface layer is pale brown fine sandy loam that extends to a depth of about 16 inches. The upper part of the subsoil is red sandy clay loam that extends to a depth of about 32 inches. The middle part is red loam that extends to a depth of about 48 inches. The lower part is red sandy loam that extends to a depth of 80 inches or more.

This soil is low in natural fertility. Available water capacity is medium. Reaction is strongly acid or very strongly acid throughout. Permeability is moderate, and runoff is medium. Crops on the soil respond well to fertilization, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Briley, Pikeville, Ruston, Sacul, and Savannah soils. Also included are small areas of soils with slopes of more than 8 percent.

This Smithdale soil has fair potential for cultivated crops. Adapted cultivated crops include truck crops, cotton, soybeans, corn, and small grains. Erosion is a severe hazard if cultivated crops are grown. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion.

Potential for pasture is good. Adapted pasture plants include bermudagrass, bahiagrass, and tall fescue.

Potential is good for loblolly pine. This soil is used mainly for commercial production of these trees. There are no significant limitations for woodland use and management.

This soil has good potential for most urban uses. There are no significant limitations for septic tank absorption fields, dwellings, and local roads and streets. Slope is a moderate limitation for industrial sites. This limitation can be easily overcome.

This soil is in capability unit IIIe-1 and woodland suitability group 3o1.

26—Smithdale fine sandy loam, 8 to 12 percent slopes. This well drained, moderately sloping soil is on hillsides on the Coastal Plain. Individual areas range from about 20 to 500 acres.

Typically, the surface layer is dark brown fine sandy loam about 8 inches thick. The subsurface layer is pale brown fine sandy loam that extends to a depth of 16 inches. The upper part of the subsoil is red sandy clay loam that extends to a depth of about 32 inches. The middle part is red loam that extends to a depth of about

48 inches. The lower part is red sandy loam that extends to a depth of 80 inches or more.

This soil is low in natural fertility. Available water capacity is medium. Reaction is strongly acid or very strongly acid throughout. Permeability is moderate, and runoff is medium. Crops on the soil respond well to fertilization, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Briley, Pikeville, Sacul, and Savannah soils. Also included are small areas of soils with slopes of less than 8 percent.

This Smithdale soil has poor potential for cultivated crops. Adapted cultivated crops include truck crops, cotton, soybeans, corn, and small grains. Erosion is a severe hazard if cultivated crops are grown. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion.

Potential for pasture is good. Adapted pasture plants include bermudagrass, bahiagrass, and tall fescue.

Potential is good for loblolly pine. This soil is used mainly for commercial production of these trees. There are no significant limitations for woodland use and management.

This soil has fair potential for most urban uses. Slope is a moderate limitation for dwellings, local roads and streets, and septic tank absorption fields. Slope is a severe limitation for industrial sites. These limitations can usually be easily overcome.

This soil is in capability unit IVe-2 and woodland suitability group 3o1.

27—Smithdale association, gently rolling. This association consists of well drained soils in a regular and repeating pattern. The landscape is mainly low hills with narrow tops, gently sloping side slopes, and narrow drainageways. The Smithdale soils are mainly on the side slopes and the minor soils are on the narrow ridgetops and toeslopes and in the drainageways. These soils formed in thick beds of loamy marine sediments. Slopes are 3 to 8 percent. Mapped areas range from about 100 to 1,000 acres.

Smithdale soils make up about 75 percent of this map unit. Typically, the surface layer is dark brown fine sandy loam about 8 inches thick. The subsurface layer is pale brown fine sandy loam that extends to a depth of about 16 inches. The upper part of the subsoil is red sandy clay loam that extends to a depth of about 32 inches. The middle part is red loam that extends to a depth of about 48 inches. The lower part is red sandy loam that extends to a depth of 80 inches or more.

Smithdale soils are low in natural fertility. Available water capacity is medium. Reaction is strongly acid or very strongly acid throughout. Permeability is moderate, and runoff is medium. Crops on the soil respond well to fertilization, and tilth is easy to maintain.

Included with the Smithdale soils in mapping are small areas of Briley, Ouachita, Pikeville, Ruston, Sacul, and Savannah soils.

These Smithdale soils have fair potential for cultivated crops. Adapted cultivated crops include truck crops, cotton, soybeans, corn, and small grains. Erosion is a severe hazard if cultivated crops are grown. Minimum tillage, contour farming, and the use of cover crops help reduce runoff and control erosion.

Potential for pasture is good, and the soil is used mainly as pasture. Adapted pasture plants include bermudagrass, bahiagrass, and tall fescue.

Potential is good for loblolly pine. There are no significant limitations for woodland use and management.

These soils have good potential for most urban uses. There are no significant limitations for septic tank absorption fields, dwellings, and local roads and streets. Slope is a moderate limitation for industrial sites. This limitation can be easily overcome.

These soils are in capability unit IIIe-1 and woodland suitability group 3o1.

28—Smithdale association, rolling. This association consists of well drained soils in a regular and repeating pattern. The landscape is mainly hills with narrow tops, moderately sloping and moderately steep side slopes, and narrow drainageways. The Smithdale soils are mainly on the side slopes, and the minor soils are on the narrow ridgetops and toeslopes and in the drainageways. These soils formed in thick beds of loamy marine deposits. Slope ranges from 8 to 20 percent. Mapped areas range from about 100 to 1,000 acres.

Smithdale soils make up about 75 percent of this map unit. Typically, the surface layer is dark brown fine sandy loam about 8 inches thick. The subsurface layer is pale brown fine sandy loam that extends to a depth of about 16 inches. The upper part of the subsoil is red sandy clay loam that extends to a depth of about 32 inches. The middle part is red loam that extends to a depth of about 48 inches. The lower part is red sandy loam that extends to a depth of 80 inches or more.

Smithdale soils are low in natural fertility. Available water capacity is medium. Reaction is strongly acid or very strongly acid throughout. Permeability is moderate, and runoff is medium. Crops on the soil respond well to fertilization, and tilth is easy to maintain.

Included with these soils in mapping are small areas of Briley, Ouachita, Pikeville, Ruston, Sacul, and Savannah soils.

These Smithdale soils have poor potential for cultivated crops. Potential for pasture is good. Adapted pasture plants include bermudagrass, bahiagrass, and tall fescue. Erosion is a severe hazard where the soil is tilled to establish pasture.

Potential is good for loblolly pine. These soils are mainly used for commercial production of these trees.

There are no significant limitations for woodland use and management.

This map unit has fair to poor potential for most urban uses. Slope is a moderate limitation for septic tank absorption fields, dwellings, and local roads and streets. Slope is a severe limitation for industrial sites. These limitations are difficult or impractical to overcome.

These soils are in capability unit VIe-2 and woodland suitability group 3o1.

29—Smithdale-Sacul association, rolling. This association consists of well drained and moderately well drained soils in a regular and repeating pattern. The landscape is mainly hills with narrow tops, moderately sloping and moderately steep side slopes, and narrow drainageways. The Smithdale soil is mainly on the ridgetops and upper side slopes, and the Sacul soil is mainly on the foot slopes and lower side slopes. The Smithdale soil formed in loamy marine sediments. The Sacul soil formed in stratified loamy and clayey marine sediments. Slopes are 8 to 20 percent. Mapped areas range from about 100 to 2,000 acres.

The well drained Smithdale soil makes up about 55 percent of this map unit. Typically, the surface layer is dark brown fine sandy loam about 8 inches thick. The subsurface layer is pale brown fine sandy loam that extends to a depth of about 16 inches. The upper part of the subsoil is red sandy clay loam that extends to a depth of about 32 inches. The middle part is red loam that extends to a depth of about 48 inches. The lower part is red sandy loam that extends to a depth of 80 inches or more.

The Smithdale soil is low in natural fertility. Available water capacity is medium. Reaction is strongly acid or very strongly acid throughout. Permeability is moderate, and runoff is rapid. Crops on the soil respond well to fertilization, and tilth is easy to maintain.

The moderately well drained Sacul soil makes up about 35 percent of this map unit. Typically, the surface layer is dark grayish brown fine sandy loam about 4 inches thick. The subsurface layer is pale brown fine sandy loam that extends to a depth of about 8 inches. The upper part of the subsoil is red clay that extends to a depth of about 18 inches. The next part is red, mottled clay that extends to a depth of about 27 inches. The next part is mottled light brownish gray, red, and yellowish red clay and clay loam that extends to a depth of about 47 inches. The next part is mottled light brownish gray, yellowish brown, and yellowish red clay loam that extends to a depth of 56 inches. The underlying material is light brownish gray, mottled clay loam that contains layers of brown silt loam and that extends to a depth of 72 inches or more.

The Sacul soil is low in natural fertility. Available water capacity is medium. Reaction is strongly acid or very strongly acid throughout. Permeability is slow, and runoff is rapid. Crops on this soil respond well to fertilization, and tilth is easy to maintain.

Included with these Smithdale and Sacul soils in mapping are small areas of Briley, Ruston, Savannah, and Sawyer soils.

These Smithdale and Sacul soils have poor potential for cultivated crops. Potential for pasture is good. Adapted pasture plants include bermudagrass, bahiagrass, and tall fescue. Erosion is a severe hazard when these soils are tilled for the establishment of pasture plants.

These soils are mainly woodland. Potential is good for loblolly pine. The erosion hazard is the main concern in woodland management.

The Smithdale soil has fair to poor potential for most urban uses. Slope is a moderate limitation for septic tank absorption fields, dwellings, and local roads and streets. Slope is a severe limitation for industrial sites. These limitations are difficult to overcome.

The Sacul soil has poor potential for most urban uses. Low strength and high shrink-swell potential are severe limitations for dwellings and local roads and streets. Low strength, high shrink-swell potential, and slope are severe limitations for industrial sites. Slow permeability is a severe limitation for septic tank absorption fields. These limitations are difficult or impractical to overcome.

The Smithdale soil is in capability unit VIe-2 and woodland suitability group 3o1. The Sacul soil is in capability unit VIe-2 and woodland suitability group 3c2.

30—Smithton fine sandy loam. This poorly drained, level soil is on broad upland flats on the Coastal Plain. Slopes are 0 to 1 percent. Individual areas range from about 20 to 1,000 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 4 inches thick. The subsurface layer is grayish brown, mottled fine sandy loam that extends to a depth of about 12 inches. The upper part of the subsoil is light brownish gray, mottled loam that extends to a depth of about 45 inches. The middle part is grayish brown, mottled loam that extends to a depth of about 62 inches. The lower part is gray, mottled loam that extends to a depth of 72 inches or more.

This soil is low in natural fertility. Available water capacity is high. Reaction is strongly acid or very strongly acid throughout. Permeability is moderately slow, and runoff is very slow. The water table is seasonally high; it is within 12 inches of the surface during winter and early spring. Crops on the soil respond well to fertilization, and tilth is easy to maintain.

Included with this soil in mapping are a few small areas of Amy, Guyton, Pheba, and Savannah soils.

This Smithton soil has fair potential for cultivated crops. Adapted cultivated crops include soybeans and winter small grains. Because excess surface water is a hazard on these soils, drainage systems are needed.

Potential for pasture is good. Adapted pasture plants include bermudagrass, bahiagrass, tall fescue, and white clover. Wetness during late winter and early spring is a hazard. During these wet seasons, livestock traffic severely damages pastures, and access to supplemental feeding sites is restricted.

Potential is good for loblolly pine and sweetgum. This soil is used mainly for commercial production of these trees. Wetness is the main limitation to equipment use in managing and harvesting the trees, but this limitation is usually overcome by logging during the drier seasons.

This soil has poor potential for most urban uses. Wetness is a severe limitation for dwellings, local roads and streets, and industrial sites. Moderately slow permeability and wetness are severe limitations for septic tank absorption fields. These limitations are difficult or impractical to overcome.

This soil is in capability unit IIIw-1 and woodland suitability group 2w9.

31—Smithton-Pheba association. This association consists of poorly drained and somewhat poorly drained soils in a regular and repeating pattern on broad upland flats on the Coastal Plain. The Smithton soil is mainly in depressional areas, and the Pheba soil is in better drained areas. These soils formed in loamy Coastal Plain sediments. Slopes are 0 to 1 percent. Mapped areas range from about 100 to 1,000 acres.

The poorly drained Smithton soil makes up about 55 percent of this map unit. Typically, the surface layer is dark grayish brown fine sandy loam about 4 inches thick. The subsurface layer is grayish brown, mottled fine sandy loam that extends to a depth of about 12 inches. The upper part of the subsoil is light brownish gray, mottled loam that extends to a depth of about 45 inches. The middle part is grayish brown, mottled loam that extends to a depth of about 62 inches. The lower part is gray, mottled loam that extends to a depth of 72 inches or more.

The Smithton soil is low in natural fertility. Available water capacity is high. Reaction is strongly acid or very strongly acid throughout. Permeability is moderately slow, and runoff is slow. The water table is seasonally high; it is within 12 inches of the surface during winter and early spring. Crops on this soil respond well to fertilization, and tilth is easy to maintain.

The somewhat poorly drained Pheba soil makes up about 35 percent of this map unit. Typically, the surface layer is dark grayish brown silt loam about 4 inches thick. The subsurface layer is pale brown silt loam that extends to a depth of about 8 inches. The upper part of the subsoil is light yellowish brown, mottled silt loam that extends to a depth of about 22 inches. The next layer is light brownish gray, mottled silt loam that extends to a depth of about 29 inches. The lower part of the subsoil is yellowish brown, mottled silt loam that is a compact, brittle fragipan and that extends to a depth of 72 inches or more.

The Pheba soil is low in natural fertility. Available water capacity is medium. Reaction is strongly acid or very strongly acid throughout. Permeability is moderate in the upper part of the subsoil and moderately slow in the fragipan. Runoff is slow. A seasonal water table is perched above the fragipan during late winter and early spring. Crops on the soil respond well to fertilization, and tilth is easy to maintain.

Included with these Smithton and Pheba soils in mapping are small areas of Amy, Guyton, Ouachita, Savannah, and Sawyer soils.

These Smithton and Pheba soils have fair potential for cultivated crops. Adapted crops include soybeans and small grains. Because excess surface water is a hazard on these soils, drainage systems are needed.

Potential for pasture is good. Adapted pasture plants include bermudagrass, bahiagrass, tall fescue, and white clover. Wetness during late winter and early spring is a hazard. During wet seasons, livestock traffic severely damages pastures, and access to feeding sites is restricted.

These soils have good potential for loblolly pine and sweetgum. They are used mainly for commercial production of these trees. Wetness is the main limitation to equipment use in managing and harvesting the trees, but this limitation is usually overcome by logging during the drier seasons.

These soils have poor potential for most urban uses. Wetness is a severe limitation for dwellings, local roads and streets, and industrial sites. Slow permeability and wetness are severe limitations for septic tank absorption fields. These limitations are difficult or impractical to overcome.

The Smithton soil is in capability unit IIIw-1 and woodland suitability group 2w9. The Pheba soil is in capability unit IIIw-1 and woodland suitability group 2w8.

32—Udorthents, loamy. This map unit consists of loamy soil material that has been excavated from borrow areas and deposited over above-ground concrete munitions bunkers. These deposits are 2.5 to 4 feet thick.

Soil material on bunkers makes up about 15 to 40 percent of this map unit. These areas are in the abandoned Shumaker Naval Ammunition Depot. Bunkers are 15 to 20 feet high, 100 to 150 feet long, and 100 to 150 feet wide. Slopes are steep, runoff is very rapid, and the hazard of erosion is very severe.

Areas between bunkers make up about 20 to 40 percent of this map unit. These areas have been scraped to depths of 2 to 3 feet to obtain cover material, and the soils cannot be identified. These areas are level to nearly level, runoff is slow to moderate, and the hazard of erosion is slight to moderate.

Included in mapping are areas of Amy, Savannah, Smithton, and Ruston soils that have disturbed surface and subsurface layers. Also included are gravel pits, borrow pits, and areas covered by roads, railroads, buildings, and other structures.

This map unit has no potential for cultivated crops. Most areas of this map unit have been planted to pine, or pines have become established through natural reseeding. Grasses and native shrubs are growing on—and have stabilized—the bunker areas. This unit has fair potential for trees and improved pasture.

These soils are not assigned to a capability unit or a woodland suitability group.

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, 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.

About 2 percent of the soil survey area was used for crops and about 4 percent was used for pasture and hayland in 1967 (*5*). The potential of the soils in Calhoun and Dallas Counties for increased production of food is good. A considerable acreage of potentially good cropland is currently used as woodland or pasture. In addition to the reserve production capacity represented by this land, food production could also be increased by extending the latest crop production technology to all cropland in the county. This soil survey can greatly facilitate the application of such technology.

The soils in Calhoun and Dallas Counties are medium to low in content of nitrogen, potassium, phosphorus, calcium, and organic matter. Many of the soils that are suitable for cultivation are erodible. Poor surface or internal drainage and the susceptibility to flooding are limitations in places.

Contour cultivation, terraces, and grassed waterways are needed on sloping soils that are used for clean-tilled crops. Row arrangement and suitable drainage are needed for dependable growth in wet areas.

Annual cover crops of grasses and legumes should be grown regularly in the cropping system if the hazard of erosion is severe or if the crops grown leave only a small amount of residue. Crop residue should be left on the surface to provide protective cover.

A plowpan commonly forms in loamy soils that are improperly tilled or that are tilled frequently with heavy equipment. Keeping tillage to a minimum, varying the depth of tillage, and tilling when the content of soil moisture is favorable help to prevent formation of a plowpan.

If left bare, the loamy soils tend to crust and pack during periods of heavy rainfall. Growing cover crops and managing crop residue help maintain good tilth.

Soybeans are the primary row crop grown in the survey area. Small acreages of grain sorghum, corn, and cotton are also grown. Truck crops include tomatoes, watermelons, and cantaloupes.

The amount of fertilizer and lime to be applied should be determined by soil tests and will depend upon the kinds of crops to be grown.

Coastal bermudagrass, common bermudagrass, and Pensacola bahiagrass are the summer perennials most commonly grown in the county. Coastal bermudagrass and Pensacola bahiagrass are fairly new to the county, but both are highly satisfactory in production of good quality forage. Tall fescue is the principal winter perennial grass now grown. Annual lespedeza and white clover, the most commonly grown legumes, are usually grown in combination with grass.

Proper grazing is essential for the production of high quality forage, stand survival, and erosion control. This includes maintaining sufficient topgrowth on the plants during the growing season to provide for vigorous healthy growth. It excludes or restricts grazing of tall fescue in summer. Brush control is essential, and weed control is needed in many places.

Grass pastures respond well to nitrogen fertilizer. Pastures of grass and legume mixtures may require phosphate and potash fertilizers and lime at rates based on soil tests.

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 7. 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 crop is not suited to or 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 7.

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 7 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, cranberries, 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 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.

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

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

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

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

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

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

Class VIII soils and 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 capability unit is identified in the description of each soil map unit in the section "Soil maps for detailed planning." Capability units are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe-1 or IIIe-2.

Woodland management and productivity

Paul I. Brown, forester, Soil Conservation Service, helped prepare this section.

Originally, Calhoun and Dallas Counties were covered by forests. Principal commercial species in this undisturbed forest were loblolly pine, shortleaf pine, oak, sweetgum, and hickory on the uplands and oak, sweetgum, tupelogum, pine, baldcypress, ash, sycamore, eastern cottonwood, and pecan on the bottom lands. Approximately 86 percent of the soil survey area was forested in 1969. Approximately 348,000 acres of this forest land was in Calhoun County, and 372,000 acres was in Dallas County (*6*).

Excellent stands of commercial trees grow in the survey area. The uplands are now dominated by the loblolly pine forest type. The species composition on the bottom lands is relatively unchanged.

The value of wood products in the area is substantial; however, production could be increased through better management. Additionally, the woodland is valuable for grazing livestock, for use as wildlife habitat, recreation areas, scenic areas, and especially for the conservation of soil and water.

Table 8 contains information useful to woodland owners or forest managers planning use of soils for wood crops. Map unit symbols for soils suitable for wood crops are listed, and the woodland suitability group symbol for each soil is given. All soils bearing the same woodland suitability group symbol require the same general kinds of woodland management and have about the same potential productivity.

The first part of the *woodland suitability group 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.

The third element in the symbol, a numeral, indicates the kind of trees for which the soils in the group are best suited and also indicates the severity of the hazard or limitation. The numerals 1, 2, and 3 indicate slight, moderate, and severe limitations, respectively, and suitability for needleleafed trees. The numerals 4, 5, and 6 indicate slight, moderate, and severe limitations, respectively, and suitability for broadleafed trees. The numerals 7, 8, and 9 indicate slight, moderate, and severe limitations, respectively, and suitability for both needleleafed and broadleafed trees.

In table 8 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 merchantable or *common trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. Site index ratings were calculated at age 30 for eastern cottonwood, at age 35 for American sycamore, and at age 50 for all other species. The site index applies to fully stocked, even-aged, unmanaged stands. Common 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

James L. Janski, assistant state conservation engineer, Soil Conservation Service, helped prepare this section.

This section provides information about the use of soils for building site development, sanitary facilities, construction materials, 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 uses; (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 9 shows, for each kind of soil, the degree and kind of limitations for building site development; table 10, for sanitary facilities; and table 12, for water management. Table 11 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 9. 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 9 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 9 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 10 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*, or *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 10 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.

Where 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 11 by ratings of good, fair, poor, or unsuited. 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 15 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 potential frost action, 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 11 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 rated *unsuited* as 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 15.

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 limit or prevent 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 and very firm clayey soils; soils with suitable layers less than 8 inches thick; soils having 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 12 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 a soil for use in embankments, dikes, and levees.

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.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to intercept runoff. They allow water to soak into the soil or flow slowly to an outlet. Features that affect suitability of a soil for terraces are uniformity and steepness of slope; depth to bedrock, hardpan, or other unfavorable material; large stones; permeability; ease of establishing vegetation; and resistance to water erosion, soil blowing, soil slipping, and piping.

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 soils of the survey area are rated in table 13 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 13 can be supplemented by information in other parts of this survey. Especially helpful are interpretations for septic tank absorption fields, given in table 10, and interpretations for dwellings without basements and for local roads and streets, given in table 9.

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

Paul M. Brady, biologist, Soil Conservation Service, helped prepare this section.

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 14, 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 wildlife 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, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, sorghum, soybeans, and millet.

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, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are ryegrass, annual lespedeza, and red clover.

Wild herbaceous plants are native or naturally established grasses 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, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are beggarweed, perennial lespedeza, ragweed, pokeweed, and cheatgrass.

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 trees and shrubs and vines are oak, hickory, wild cherry, dogwood, maple, viburnum, honeysuckle, greenbrier, and grape.

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 loblolly pine, shortleaf pine, and redcedar.

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, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, rushes, sedges, cattail, and pond weed.

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 cottontail rabbit, bobwhite quail, mourning dove, meadowlark, and field sparrow.

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 whitetail deer, wild turkey, gray squirrel, raccoon, and woodpecker.

Wetland habitat consists of open, marshy or swampy, shallow water areas where water-tolerant plants grow. Wildlife attracted to these areas include ducks, geese, kingfisher, mink, muskrat, 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 properties

Table 15 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 15 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 15 in the standard terms used by the U.S. Department of Agriculture (*4*). 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 estimated classification, without group index numbers, is given in table 15. Also in table 15 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.

In some surveys, the estimates are rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount across classification boundaries (1 or 2 percent), the classification in the marginal zone is omitted.

Physical and chemical properties

Table 16 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.

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.

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 17 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 17 are the depth to the seasonal high water table; the kind of water table, that is, perched, artesian, or apparent; and the months of the year that the water table commonly is 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.

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.

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 (*4*). 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."

Amy series

The Amy series consists of poorly drained, slowly permeable soils that formed in silty marine sediments. These soils are on broad, level upland flats on the Coastal Plain. They are saturated with water in late winter and early spring. The native vegetation is mixed pines and hardwoods. Slopes are 0 to 1 percent.

Amy soils are geographically associated with Bonn, Ouachita, and Pheba soils. Bonn soils, which are on broad flats adjacent to Amy soils, have a natric horizon. Ouachita soils, which are on flood plains, have a browner subsoil and a cambic horizon. Pheba soils, which occur on slightly higher landscapes, have a coarse-silty control section and a fragipan.

Typical pedon of Amy silt loam in a wooded area in the SE1/4NE1/4NE1/4 sec. 14, T. 10 S., R. 17 W., Dallas County:

A1—0 to 5 inches; dark grayish brown (10YR 4/2) silt loam; few fine faint yellowish brown and gray mottles; weak fine granular structure; very friable; many fine and medium roots; few fine soft dark accumulations of iron and manganese oxides; very strongly acid; clear smooth boundary.

A21g—5 to 10 inches; light gray (10YR 6/1) silt loam; many fine distinct yellowish brown mottles; weak fine subangular blocky structure; friable; many fine roots; few soft dark accumulations of iron and manganese oxides; very strongly acid; gradual smooth boundary.

A22g—10 to 20 inches; light gray (10YR 6/1) silt loam; many medium distinct yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; friable; common fine roots; common fine pores; few soft dark accumulations of iron and manganese oxides; very strongly acid; abrupt wavy boundary.

B21tg—20 to 40 inches; gray (10YR 5/1) silty clay loam; many medium distinct yellowish brown (10YR 5/8) and brown (10YR 5/3) mottles; moderate medium subangular blocky structure; firm; few soft dark accumulations of iron and manganese oxides; few thin patchy clay films on faces of peds; few interfingers of light gray (10YR 6/1) silt loam A2 material; very strongly acid; abrupt wavy boundary.

B22tg—40 to 52 inches; light brownish gray (10YR 6/2) silt loam; many medium distinct yellowish brown (10YR 5/8) and common fine faint gray mottles; moderate medium subangular blocky structure; firm; common fine pores; few soft dark accumulations of iron and manganese oxides; few thin patchy clay films on faces of peds; very strongly acid; abrupt wavy boundary.

Cg—52 to 72 inches; gray (10YR 5/1) silt loam; many medium distinct yellowish brown (10YR 5/8) mottles; massive; firm; few fine pores; few soft dark accumulations of iron and manganese oxides; very strongly acid.

Solum thickness ranges from 40 to 70 inches. Reaction is strongly acid or very strongly acid throughout.

The A horizon is dominantly about 20 inches thick but ranges to less than 9 inches in thickness. The A1 horizon has hue of 10YR with value of 4 and chroma of 1 or 2, or with value of 5 and chroma of 2. The A2 horizon has hue of 10YR, value of 6, and chroma of 1 or 2.

The B2tg horizon has hue of 10YR with value of 5 or 6 and chroma of 1, or with value of 6 and chroma of 2, or it has hue of 2.5Y, value of 6, and chroma of 2. There are common or many fine or medium mottles in shades of brown. Texture is silt loam or silty clay loam.

The C horizon has the same color and texture range as the B2tg horizon.

Bonn series

The Bonn series consists of poorly drained, very slowly permeable soils that formed in old alluvial deposits. These soils are on level upland flats in areas of low relief on the Coastal Plain. They are saturated with water in late winter and early spring. The native vegetation is scrub hardwoods, pines, and grasses. Slopes are 0 to 1 percent.

Bonn soils are geographically associated with Amy soils. Amy soils, which are on broad flats adjacent to Bonn soils, do not have a natric horizon.

Typical pedon of Bonn silt loam in an idle field in the SE1/4NW1/4NE1/4 sec. 16, T. 15 S., R. 13 W., Calhoun County:

A1—0 to 3 inches; grayish brown (10YR 5/2) silt loam; few fine distinct strong brown mottles; moderate medium subangular blocky structure; few fine roots; few fine dark concretions; medium acid; abrupt smooth boundary.

A2—3 to 12 inches; light brownish gray (10YR 6/2) silt loam; few fine distinct strong brown mottles; peds coated with brown (10YR 5/3) silt loam; moderate medium granular structure; friable; many fine roots; few fine dark concretions; slightly acid; gradual smooth boundary.

A&B—12 to 18 inches; grayish brown (10YR 5/2) silt loam; common medium distinct strong brown (7.5YR 5/8) mottles; weak coarse prismatic structure parting to weak fine subangular blocky; friable; few fine dark concretions; about 35 percent of horizon has slightly rounded B bodies on tops of prisms; B bodies have brown (10YR 5/3) ped interiors and are surrounded by light brownish gray (10YR 6/2) silt coats 2 to 4 cm thick; moderately alkaline; gradual wavy boundary.

B&A—18 to 31 inches; grayish brown (10YR 5/2) silt loam; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; many fine pores; prisms and some pores coated with dark gray (10YR 4/1) clay films; very pale brown (10YR 7/3) fine sandy loam tongues 1 to 3 inches wide extend through horizon; tongues have a few discontinuous dark gray and very dark gray clay lenses 1 to 2 mm thick; few fine dark concretions; moderately alkaline; clear wavy boundary.

B2tg—31 to 45 inches; light brownish gray (2.5Y 6/2) silt loam; few fine distinct light olive brown mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; some peds are slightly compact and brittle; common vertical veins of dark gray (10YR 4/1) silt loam; few patchy clay films on faces of peds; accumulations of very dark gray (10YR 3/1) silty clay loam occur on discontinuous horizontal bands; few pockets 1 to 2 inches wide of very pale brown (10YR 7/3) fine sandy loam; few fine dark concretions; moderately alkaline; gradual wavy boundary.

B3—45 to 60 inches; light brownish gray (10YR 6/2) silt loam; weak medium and fine subangular blocky structure; friable; few thin dark gray (10YR 4/1) clay flows and stains on peds and in root channels; few pockets 1 to 2 inches wide of very pale brown (10YR 7/3) fine sandy loam; moderately alkaline; clear wavy boundary.

C—60 to 72 inches; light brownish gray (2.5Y 6/2) silt loam; few fine distinct olive yellow mottles; massive; firm; moderately alkaline.

Solum thickness ranges from 50 to 60 inches. Reaction ranges from strongly acid to neutral in the A horizon and from neutral to strongly alkaline in the B and C horizons. Exchangeable sodium saturation ranges from 15 to 50 percent within a depth of 16 inches and throughout the B horizon.

The A horizon ranges from 10 to 16 inches in thickness. The A1 horizon has hue of 10YR with value of 4 and chroma of 1 or 2, or with value of 5 and chroma of 2. The A2 horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2.

The B2tg horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2, or it has hue of 2.5Y, value of 6, and chroma of 2. Few or common fine or medium mottles are in shades of yellow, brown, or gray. Texture is silt loam or silty clay loam.

The C horizon has the same color and texture range as the B2tg horizon.

Briley Series

The Briley series consists of well drained, moderately permeable soils that formed in unconsolidated thick beds of sandy and loamy marine sediments. These gently sloping to moderately sloping soils are on hilltops and hillsides on the Coastal Plain. The native vegetation was mixed hardwoods and pines. Slopes are 3 to 12 percent.

Briley soils are geographically associated with Ruston and Smithdale soils. Ruston and Smithdale soils, which are on lower side slopes adjacent to Briley soils, have an A horizon less than 20 inches thick and a fine-loamy control section.

Typical pedon of Briley loamy fine sand, 3 to 8 percent slopes, in a wooded area in the SE1/4NE1/4SE1/4 sec. 23, T. 10 S., R. 16 W., Dallas County:

A1—0 to 8 inches; dark grayish brown (10YR 4/2) loamy fine sand; weak fine granular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.

A2—8 to 24 inches; light yellowish brown (10YR 6/4) loamy fine sand; weak fine granular structure; very friable; few fine roots; strongly acid; gradual smooth boundary.

B1—24 to 38 inches; yellowish red (5YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; sand grains coated and bridged with clay; strongly acid; gradual smooth boundary.

B2t—38 to 72 inches; red (2.5YR 4/6) sandy clay loam; moderate medium subangular blocky structure; friable; few thin patchy clay films on surfaces of peds; strongly acid.

Solum thickness ranges from 65 to 80 inches or more. Reaction is strongly acid or very strongly acid throughout.

The A horizon ranges from 20 to 40 inches in thickness. The A1 horizon has hue of 10YR with value of 4 and chroma of 2 or 3, or with value of 5 and chroma of 3. The A2 horizon has hue of 10YR with value of 5 and chroma of 4, or with value of 6 and chroma of 3 or 4.

The B1 horizon, where present, has hue of 5YR, value of 5, and chroma of 6, or it has hue of 7.5YR, value of 5, and chroma of 6. Texture is fine sandy loam or loamy fine sand.

The B2t horizon has hue of 5YR, value of 4 or 5, and chroma of 6 or 8, or it has hue of 2.5YR, value of 4, and chroma of 6 or 8. Texture is sandy clay loam, fine sandy loam, or loam.

Guyton series

The Guyton series consists of poorly drained, slowly permeable soils that formed in silty marine sediments. These soils are on level flood plains on the Coastal Plain. They are saturated with water in late winter and early spring. The native vegetation is mixed pines and hardwoods. Slopes are 0 to 1 percent.

Guyton soils are geographically associated with Ouachita, Pheba, and Savannah soils. Ouachita soils, which are slightly higher on flood plains than Guyton soils, have a browner subsoil and a cambic horizon. Pheba and Savannah soils, which are on uplands adjacent to Guyton soils, have a fragipan. In addition, Pheba soils have a coarse-silty control section, and Savannah soils have a fine-loamy control section.

Typical pedon of Guyton silt loam in a wooded area of Guyton soils, frequently flooded, in the NE1/4SE1/4NW1/4 sec. 17, T. 10 S., R. 17 W., Dallas County:

A1—0 to 3 inches; grayish brown (10YR 5/2) silt loam; many fine distinct yellowish brown mottles; weak medium subangular blocky structure; very friable; many fine and medium roots; strongly acid; clear smooth boundary.

A2g—3 to 19 inches; light brownish gray (10YR 6/2) silt loam; many fine distinct yellowish brown mottles; weak medium subangular blocky structure; friable; few fine and medium roots; few fine soft brown accumulations of iron and manganese oxides; strongly acid; clear irregular boundary.

B&A—19 to 28 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct yellowish brown (10YR 5/4) mottles; moderate medium subangular blocky structure; friable; few thin patchy clay films on faces of peds; tongues of light brownish gray (10YR 6/2) silt loam make up about 15 percent of horizon; very strongly acid; clear wavy boundary.

B21tg—28 to 38 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct yellowish brown (10YR 5/4) and many fine faint gray mottles; moderate medium subangular blocky structure; slightly compact; friable; few thin patchy clay films; very strongly acid; clear smooth boundary.

B22tg—38 to 55 inches; gray (10YR 5/1) silty clay loam; common medium distinct strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; slightly compact; firm; few thin patchy clay films; very strongly acid; clear smooth boundary.

C—55 to 72 inches; light gray (10YR 6/1) silty clay loam; common medium distinct strong brown (7.5YR 5/6) mottles; massive; firm; strongly acid.

Solum thickness ranges from 52 to 80 inches. Reaction is strongly acid or very strongly acid in the A and B2tg horizons and slightly acid to strongly acid in the C horizon.

The A horizon ranges from 16 to 30 inches in thickness. The A1 or Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2. The A2 horizon has hue of 10YR with value of 6 or 7 and chroma of 1 or 2, or with value of 5 and chroma of 1. There are many or common mottles in shades of brown.

The B2tg horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. There are common or many fine or medium mottles in shades of brown. Texture is silt loam or silty clay loam.

The C horizon has the same color and texture range as the B horizon.

Ouachita series

The Ouachita series consists of well drained, moderately slowly permeable soils that formed in loamy sediments on level flood plains of rivers and streams on the Coastal Plain. The native vegetation was mixed hardwoods and pines. Slopes are 0 to 1 percent.

Ouachita soils are geographically associated with Amy and Guyton soils. Amy soils, which are on broad upland flats, and Guyton soils, which are slightly lower on flood plains than Ouachita soils, have a grayer subsoil and an argillic horizon.

Typical pedon of Ouachita silt loam in a wooded area of Ouachita soils, frequently flooded, in the NE1/4NE1/4SE1/4 sec. 30, T. 10 S., R. 17 W., Dallas County:

A11—0 to 6 inches; brown (10YR 4/3) silt loam; weak medium subangular blocky structure; friable; many medium and fine roots; strongly acid; abrupt smooth boundary.

A12—6 to 19 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium subangular blocky structure; friable; many fine roots; many fine pores; strongly acid; clear smooth boundary.

B21—19 to 33 inches; yellowish brown (10YR 5/4) silt loam; moderate medium subangular blocky structure; friable; few fine roots; few fine pores; very strongly acid; gradual smooth boundary.

B22—33 to 47 inches; yellowish brown (10YR 5/4) loam; few fine faint grayish brown mottles; moderate medium subangular blocky structure; slightly plastic; few fine roots; few fine pores; very strongly acid; gradual smooth boundary.

B23—47 to 68 inches; yellowish brown (10YR 5/4) loam; few medium distinct gray (10YR 5/1) and yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structures; friable; few fine pores; very strongly acid; gradual smooth boundary.

C—68 to 76 inches; yellowish brown (10YR 5/4) fine sandy loam; many medium distinct gray (10YR 5/1) and yellowish brown (10YR 5/8) mottles; weak fine granular structure; very friable; few fine pores; very strongly acid.

Solum thickness ranges from 40 to 80 inches. Reaction is strongly acid or very strongly acid throughout.

The A horizon ranges from 10 to 20 inches in thickness. The A11 horizon has hue of 10YR, value of 4, and chroma of 2 or 3. The A12 horizon has hue of 10YR with value of 4 or 5 and chroma of 3, or with value of 4 and chroma of 4.

The B2 horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Some pedons are mottled in shades of gray and brown below a depth of 24 inches. Texture is silt loam, loam, or silty clay loam.

The C horizon has the same color range as the B2 horizon. Texture is silt loam or fine sandy loam.

Pheba series

The Pheba series consists of somewhat poorly drained, moderately slowly permeable soils that formed in loamy marine sediments. These level and nearly level soils are on upland flats on the Coastal Plain. The native vegetation is mixed hardwoods and pines. Slopes are 0 to 2 percent.

Pheba soils are geographically associated with Amy, Guyton, Savannah, and Smithton soils. Amy soils, which are on lower landscapes than Pheba soils, and Guyton soils, which are on flood plains, have a fine-silty control section and do not have a fragipan. Savannah soils, which are on higher landscapes, have a browner subsoil and a fine-loamy control section. Smithton soils, which are on lower landscapes, have a coarse-loamy control section and do not have a fragipan.

Typical pedon of Pheba silt loam, 0 to 2 percent slopes, in an idle field in the NW1/4NE1/4NW1/4 sec. 1, T. 12 S., R. 14 W., Calhoun County:

A1—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam; many fine faint gray and yellowish brown mottles; weak fine granular structure; friable; many fine and medium roots; few fine pores; few fine dark concretions; strongly acid; abrupt smooth boundary.

A2—4 to 8 inches; pale brown (10YR 6/3) silt loam; few medium distinct brownish yellow (10YR 6/8) mottles; weak fine subangular blocky structure; friable; many fine roots; few fine dark concretions; few fine pores; strongly acid; clear smooth boundary.

B2—8 to 22 inches; light yellowish brown (10YR 6/4) silt loam; common fine distinct yellowish brown (10YR 5/8) and few fine faint gray mottles; weak medium subangular blocky structure; friable; few fine roots; few fine pores; many fine soft dark accumulations of iron and manganese oxides; very strongly acid; clear wavy boundary.

A'2—22 to 29 inches; light brownish gray (10YR 6/2) silt loam; many medium distinct yellowish brown (10YR 5/8) and few medium faint brown (10YR 5/3) mottles; weak medium subangular blocky structure; friable; few fine roots; few fine pores; few fine soft dark accumulations of iron and manganese oxides; very strongly acid; abrupt wavy boundary.

B'x1—29 to 40 inches; yellowish brown (10YR 5/4) silt loam; many medium distinct yellowish brown (10YR 5/8) and gray (10YR 6/1) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; firm, compact and brittle in about 70 percent of the volume; few patchy clay films; 1/2 to 1 inch wide seams of light brownish gray (10YR 6/2) silt between prisms; few soft dark accumulations of iron and manganese oxides; very strongly acid; abrupt wavy boundary.

B'x2—40 to 56 inches; yellowish brown (10YR 5/4) silt loam; many medium distinct light brownish gray (10YR 5/2) and yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; firm, compact and brittle in about 70 percent of the volume; few thin patchy clay films on ped faces; 1/2 to 1 inch wide seams of light brownish gray (10YR 6/2) silt between prisms; few soft dark accumulations of iron and manganese oxides; very strongly acid; gradual smooth boundary.

B'x3—56 to 72 inches; yellowish brown (10YR 5/6) silt loam; common fine distinct light brownish gray (10YR 6/2) mottles; weak coarse prismatic structure parting to moderate medium angular blocky; firm, very compact and brittle in about 70 percent of the volume; continuous clay films; 1/2 to 1 inch wide seams of light brownish gray (10YR 6/2) silt between prisms; very strongly acid.

Solum thickness is more than 60 inches. Reaction is strongly acid or very strongly acid throughout. Depth to the fragipan ranges from 14 to 30 inches.

The A horizon ranges from 6 to 10 inches in thickness. The A1 horizon has hue of 10YR, value of 4, and chroma of 1, 2, or 3. The Ap or A2 horizon has hue of 10YR with value of 5 and chroma of 2, or with value of 6 and chroma of 3.

The B2 horizon has hue of 10YR with value of 5 and chroma of 4 or 6, or with value of 6 and chroma of 3 or 4. There are few to many fine to medium mottles in shades of brown, yellow, and gray. Texture is silt loam or loam.

The A'2 horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2.

The B'x horizon has hue of 10YR with value of 5 and chroma of 4, 6, or 8, or with value of 6 and chroma of 4. There are few to many mottles in shades of brown, gray, and red. Texture is silt loam or silty clay loam.

Pikeville series

The Pikeville series consists of well drained, moderately permeable soils that formed in thick beds of loamy and gravelly marine sediments. These nearly level to moderately steep soils are on hilltops and hillsides on the Coastal Plain. The native vegetation was mixed hardwoods and pines. Slopes are 1 to 20 percent.

Pikeville soils are geographically associated with Ruston, Savannah, and Smithdale soils. Ruston soils, which occur on lower hilltops than Pikeville soils, and Smithdale soils, which are on adjacent lower side slopes, have less gravel in the subsoil. Savannah soils, which are on adjacent lower side slopes, have a fragipan and no gravel in the profile.

Typical pedon of Pikeville fine sandy loam, 3 to 8 percent slopes, in an idle field in the SE1/4SW1/4SW1/4 sec. 2, T. 13 S., R. 13 W., Calhoun County:

Ap—0 to 4 inches; dark brown (10YR 4/3) fine sandy loam; weak fine granular structure; friable; many fine and medium roots; 5 percent gravel by volume; strongly acid; abrupt smooth boundary.

A2—4 to 15 inches; brown (10YR 4/3) fine sandy loam; weak fine granular structure; friable; few fine roots; 8 percent gravel by volume; strongly acid; gradual wavy boundary.

B21t—15 to 28 inches; yellowish red (5YR 5/6) loam; moderate medium subangular blocky structure; friable; few thin patchy clay films on surfaces of peds; few fine roots; 12 percent gravel by volume 1/4 to 1 inch in diameter; strongly acid; gradual wavy boundary.

B22t—28 to 48 inches; yellowish red (5YR 4/6) gravelly loam; weak medium subangular blocky structure; friable; few thin patchy clay films on surfaces of peds; few fine roots; 30 percent gravel by volume 1/4 to 1 inch in diameter; very strongly acid; gradual wavy boundary.

B23t—48 to 80 inches; yellowish red (5YR 5/8) very gravelly fine sandy loam with pockets and vertical strata of strong brown (7.5YR 5/6) very gravelly loamy sand; massive; loose; compact in places; thin clay films on gravel; sand grains coated and bridged with clay; 75 percent gravel by volume 1/4 to 2 inches in diameter; very strongly acid.

Solum thickness is greater than 72 inches. Reaction is strongly acid or very strongly acid throughout.

The A horizon ranges from 10 to 18 inches in thickness. The A1 or Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2, 3, or 4. The A2 horizon has hue of 10YR, value of 4, 5, or 6, and chroma of 3 or 4.

The B21t and B22t horizons have hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 or 8. Texture of the B21t horizon is sandy clay loam, clay loam, or loam. The gravel content of the B21t horizon ranges from 0 to 15 percent. The B22t horizon is gravelly sandy clay loam, gravelly loam, gravelly fine sandy loam, very gravelly sandy clay loam, very gravelly loam, or very gravelly fine sandy loam. The gravel content ranges from 15 to 60 percent.

The B23t horizon has strata in hue of 7.5YR or 5YR with value of 4 or 5 and chroma of 6 or 8, or in hue of 10YR or 2.5YR with value of 5 and chroma of 6 or 8. Texture of the strata is very gravelly sandy clay loam, very gravelly fine sandy loam, or very gravelly loamy sand. Gravel content ranges from 35 to 80 percent by volume.

Ruston series

The Ruston series consists of well drained, moderately permeable soils that formed in loamy marine sediments. These nearly level soils are on hilltops on the Coastal Plain. The native vegetation was mixed hardwoods and pines. Slopes are 1 to 3 percent.

Ruston soils are geographically associated with Briley, Pikeville, Sacul, Savannah, and Smithdale soils. Briley soils, which are on higher side slopes adjacent to Ruston soils, have an A horizon more than 20 inches thick. Pikeville soils have more gravel in the subsoil, Sacul soils have a clayey control section, Savannah soils have a fragipan and a browner subsoil, and Smithdale soils do not have a bisequal profile. All four soils are on side slopes adjacent to Ruston soils.

Typical pedon of Ruston fine sandy loam, 1 to 3 percent slopes, in a field in the NW1/4SE1/4NW1/4 sec. 32, T. 11 S., R. 12 N., Calhoun County:

Ap—0 to 6 inches; dark brown (10YR 4/3) fine sandy loam; weak medium granular structure; friable; strongly acid; abrupt smooth boundary.

A2—6 to 15 inches; light yellowish brown (10YR 6/4) fine sandy loam; a few medium pockets of brown (7.5YR 5/4); weak medium subangular blocky structure; friable; strongly acid; abrupt wavy boundary.

B21t—15 to 29 inches; reddish brown (5YR 4/4) fine sandy loam; moderate medium subangular blocky structure; friable; clay films on ped faces; sand grains bridged and coated with clay; very strongly acid; gradual wavy boundary.

B22t—29 to 41 inches; yellowish red (5YR 4/6) fine sandy loam; moderate medium subangular blocky structure; friable; common thick continuous clay films on ped faces; sand grains bridged and coated with clay; very strongly acid; gradual wavy boundary.

B23t—41 to 55 inches; yellowish red (5YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; few pockets of light yellowish brown (10YR 6/4) fine sandy loam A2 material; few thin patchy clay films; very strongly acid; gradual wavy boundary.

B&A'2—55 to 65 inches; yellowish red (5YR 5/6) sand; weak medium subangular blocky structure; friable; pockets of light yellowish brown (10YR 6/4) A'2 material make up approximately 25 percent of the horizon; very strongly acid; abrupt wavy boundary.

B'2t—65 to 80 inches; yellowish red (5YR 5/6) sandy loam; moderate medium subangular blocky structure; firm; slightly brittle; few thin patchy clay films; very strongly acid.

Solum thickness ranges from 60 to 80 inches or more. Reaction is strongly acid or very strongly acid throughout.

The A horizon ranges from 10 to 20 inches in thickness. The A horizon has hue of 10YR with value of 5 or 6 and chroma of 2 or 4, or with value of 4 and chroma of 2 or 3.

The B2t horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 or 8, or it has hue of 5YR with value of 4 and chroma of 4. The B'2t horizon in some pedons has few or common mottles in shades of gray and brown. Texture is fine sandy loam, sandy loam, loam, clay loam, or sandy clay loam.

The A'2 horizon has hue of 10YR with value of 6 and chroma of 3 or 4. Texture is sand, sandy loam, or fine sandy loam in streaks and pockets that make up as much as 50 percent of the B&A'2 horizon.

Sacul series

The Sacul series consists of moderately well drained, slowly permeable soils that formed in loamy and clayey marine sediments. These nearly level to moderately steep soils are on hilltops and hillsides on the Coastal Plain. The native vegetation was mixed hardwoods and pines. Slopes are 1 to 20 percent.

Sacul soils are geographically associated with Ruston, Sawyer, and Smithdale soils. Ruston soils, which are on hilltops adjacent to Sacul soils, and Sawyer soils, which are on less dissected landscapes, have a fine-silty control section. Smithdale soils, which are on similar landscapes, have a fine-loamy control section.

Typical pedon of Sacul fine sandy loam, 3 to 8 percent slopes, in a wooded area in the NW1/4SW1/4SW1/4 sec. 23, T. 9 S., R. 15 W., Dallas County:

A1—0 to 4 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; very friable; many fine roots; few fine dark accumulations of iron and manganese oxides; strongly acid; abrupt smooth boundary.

A2—4 to 8 inches; pale brown (10YR 6/3) fine sandy loam; weak fine granular structure; very friable; common fine and medium roots; few fine soft dark accumulations of iron and manganese oxides; strongly acid; clear smooth boundary.

B21t—8 to 18 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; firm, plastic; continuous clay films on faces of peds; few fine soft dark accumulations of iron and manganese oxides; very strongly acid; gradual smooth boundary.

B22t—18 to 27 inches; red (2.5YR 5/6) clay; common medium distinct light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; firm, plastic; common thick continuous red (2.5YR 4/6) clay films on faces of peds; few fine and medium roots; few fine soft dark accumulations of iron and manganese oxides; very strongly acid; diffuse boundary.

B23t—27 to 36 inches; mottled light brownish gray (10YR 6/2), red (2.5YR 4/6), and yellowish red (5YR 5/6) clay; moderate medium subangular blocky structure; firm, plastic; common thick continuous clay films on faces of peds; few fine and medium roots; very strongly acid; gradual smooth boundary.

B24t—36 to 47 inches; mottled light brownish gray (10YR 6/2) and red (2.5YR 4/8) clay loam with few small pockets of yellowish red (5YR 5/8) sand; moderate medium subangular blocky structure; friable; common thick continuous clay films on faces of most peds; few fine roots; very strongly acid; clear smooth boundary.

B25t—47 to 56 inches; mottled light brownish gray (10YR 6/2) and yellowish brown (10YR 5/8) clay loam with few small pockets of yellowish red (5YR

5/8) sand; moderate medium subangular blocky structure; friable; common thick continuous clay films on faces of most peds; very strongly acid; clear smooth boundary.

C—56 to 72 inches; light brownish gray (10YR 6/2) clay loam with few thin layers of brown (10YR 5/3) silt loam; few medium distinct yellowish brown (10YR 5/8) mottles; massive; friable; very strongly acid.

Solum thickness ranges from 40 to more than 72 inches. Reaction is strongly acid or very strongly acid throughout.

The A horizon ranges from 5 to 10 inches in thickness. The A1 or Ap horizon has hue of 10YR with value of 4 and chroma of 2 or 3. The A2 horizon has hue of 10YR with value of 5 or 6 and chroma of 3 or 4.

The B21t and B22t horizons have hue of 2.5YR or 5YR with value of 4 or 5 and chroma of 6 or 8. The B22t horizon has common or many mottles in shades of gray. The B23t, B24t, and B25t horizons are mottled in shades of red, gray, and brown. These colors are about equal or the gray or the red is dominant. Texture of the B2t horizon is clay or silty clay in the upper part and silty clay loam, clay loam, or silt loam in the lower part.

The C horizon is mottled gray, brown, and, in places, red. It is stratified. Textures are sandy loam, sandy clay loam, clay loam, or silt loam.

Savannah series

The Savannah series consists of moderately well drained, moderately permeable soils that formed in loamy marine sediments. These nearly level and gently sloping soils are on low ridges, hilltops, and hillsides on the Coastal Plain. The native vegetation is mixed hardwoods and pines. Slopes are 1 to 8 percent.

Savannah soils are geographically associated with Guyton, Pheba, Pikeville, Ruston, Sawyer, and Smithton soils. Guyton soils, which are on flood plains adjacent to Savannah and Sawyer soils, have a fine-silty control section and do not have a fragipan. Pheba soils, which are on lower landscapes, have a grayer subsoil and a coarse-silty control section. Pikeville soils, which are on adjacent higher side slopes, do not have a fragipan and have gravel in the lower part of the subsoil. Ruston soils, which are on adjacent higher hilltops, have redder subsoils and do not have a fragipan. Sawyer soils, which are on similar landscapes, have a fine-silty control section and do not have a fragipan. Smithton soils, which are on lower landscapes, have a coarse-loamy control section and do not have a fragipan.

Typical pedon of Savannah fine sandy loam, 1 to 3 percent slopes, in a wooded area in the NW1/4SW1/4SW1/4 sec. 25, T. 11 S., R. 14 W., Calhoun County:

A1—0 to 4 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.

A2—4 to 9 inches; pale brown (10YR 6/3) fine sandy loam; weak fine granular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.

B2t—9 to 27 inches; yellowish brown (10YR 5/8) loam; moderate medium subangular blocky structure; friable; few fine roots; few thin patchy clay films on faces of peds; few fine soft dark accumulations of iron and manganese oxides; strongly acid; clear smooth boundary.

Bx1—27 to 37 inches; yellowish brown (10YR 5/6) loam; many medium distinct light brownish gray (10YR 6/2) and brownish yellow (10YR 6/8) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; hard and about 60 percent by volume is compact and brittle; common fine voids; few thin patchy clay films on faces of peds; light brownish gray (10YR 6/2) silt coatings on faces of prisms; few fine soft dark accumulations of iron and manganese oxides; very strongly acid; clear smooth boundary.

Bx2—37 to 48 inches; mottled light brownish gray (10YR 6/2), yellowish brown (10YR 5/4), and strong brown (7.5YR 5/8) loam; weak coarse prismatic structure parting to moderate medium subangular blocky; hard and about 60 percent by volume is compact and brittle; few fine voids; many thin patchy clay films on faces of peds; light brownish gray (10YR 6/2) silt coatings on faces of peds; very strongly acid; abrupt irregular boundary.

Bx3—48 to 59 inches; mottled reddish brown (5YR 5/4), strong brown (7.5YR 5/8), and yellowish brown (10YR 5/4) sandy loam; weak coarse prismatic structure parting to moderate medium angular and subangular blocky; friable and about 60 percent by volume is compact and brittle; sand grains coated and bridged with clay; light brownish gray (10YR 6/2) silt coatings on faces of prisms; very strongly acid; clear smooth boundary.

B3—59 to 72 inches; mottled yellowish brown (10YR 5/4, 5/8) and gray (10YR 6/1) sandy loam with pockets of pale brown (10YR 6/3) loamy sand; weak medium subangular blocky structure; friable; very strongly acid.

Solum thickness ranges from 60 to more than 80 inches. Reaction ranges from strongly acid to extremely acid throughout. Depth to the fragipan ranges from 22 to 38 inches.

The A horizon ranges from 7 to 12 inches in thickness. The A1 and A2 horizons have hue of 10YR with value of 4 and chroma of 2, value of 6 and chroma of 3, or value of 5 and chroma of 3, 4, or 6.

The B2t horizon has hue of 7.5YR, value of 5, and chroma of 6 or 8, or it has hue of 10YR, value of 5, and chroma of 4, 6, or 8. The Bx horizon is mottled in shades of yellow, brown, red, and gray or is yellowish brown mottled with gray. The B3 horizon, where present, has the same color range as the Bx horizon. Texture of the B horizon is sandy loam, sandy clay loam, or loam.

Sawyer series

The Sawyer series consists of moderately well drained, slowly permeable soils that formed in stratified loamy and clayey marine sediments. These nearly level and gently sloping soils are on hilltops and hillsides on the Coastal Plain. The native vegetation was mixed hardwoods and pines. Slopes are 1 to 8 percent.

Sawyer soils are geographically associated with Sacul and Savannah soils. Sacul soils, which are on more dissected landscapes than Sawyer soils, have a clayey control section. Savannah soils, which are on similar landscapes, have a fine-loamy control section and a fragipan.

Typical pedon of Sawyer silt loam, 3 to 8 percent slopes, in a wooded area in the NW1/4NE1/4NE1/4 sec. 26, T. 10 S., R. 14 W., Dallas County:

A1—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; friable; many fine and medium roots; few fine dark accumulations of iron and manganese oxides; strongly acid; abrupt smooth boundary.

B21t—4 to 20 inches; yellowish brown (10YR 5/4) silt loam; moderate medium subangular blocky structure; friable; few thin patchy clay films on faces of peds; common fine roots; few dark accumulations of iron and manganese oxides; few small pebbles; very strongly acid; gradual smooth boundary.

B22t—20 to 30 inches; yellowish brown (10YR 5/6) silty clay loam; few fine distinct yellowish red (5YR 5/8) and gray (10YR 5/1) mottles; moderate medium subangular blocky structure; slightly plastic; few thin patchy clay films on faces of peds; few fine roots; few fine dark accumulations of iron and manganese oxides; few small pebbles; very strongly acid; gradual smooth boundary.

B23t—30 to 52 inches; mottled gray (10YR 5/1), red (2.5YR 4/8), and strong brown (7.5YR 5/8) silty clay; moderate medium subangular blocky structure; plastic; thin continuous clay films; few fine roots; few fine dark concretions; few small pebbles; very strongly acid; clear smooth boundary.

B24t—52 to 80 inches; gray (10YR 5/1) clay; few medium distinct strong brown (7.5YR 5/8) mottles and few fine distinct dark red mottles; moderate medium blocky structure; plastic; thin continuous clay films; few fine roots; few small pebbles; red mottles are more friable than the matrix; very strongly acid.

Solum thickness ranges from 60 to 80 inches or more. Depth to the clayey B23t horizon ranges from 22 to 40 inches. Reaction ranges from extremely acid to strongly acid throughout.

The A horizon ranges from 3 to 8 inches in thickness. The A1 horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3.

The B21t horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 6 or 8, or it has hue of 10YR, value of 5, and chroma of 4. Few fine or medium grayish mottles are present in some pedons. The B22t horizon has the same color range as the B21t horizon. It has common or many fine or medium mottles in shades of gray, brown, and red. Texture of the B21t and B22t horizons is silt loam, loam, silty clay loam, or clay loam. The B23t and B24t horizons are mottled red, brown, and gray, or they are dominantly one of these colors and are mottled with the other two colors. The red colors have hue of 2.5YR or 5YR, value of 4, and chroma of 6 or 8, or they have hue of 5YR, value of 5, and chroma of 6 or 8. The brown colors have hue of 7.5YR or 10YR, value of 5, and chroma of 6 or 8, or they have hue of 10YR, value of 5, and chroma of 4. The gray colors have hue of 10YR, value of 5 or 6, and chroma of 1 or 2. Texture of the B23t and B24t horizons is silty clay or clay.

Smithdale series

The Smithdale series consists of well drained, moderately permeable soils that formed in thick beds of loamy marine sediments. These gently sloping to moderately steep soils are on hillsides on the Coastal Plain. The native vegetation was mixed hardwoods and pines. Slopes are 3 to 20 percent.

Smithdale soils are geographically associated with Briley, Pikeville, Ruston, and Sacul soils. Briley and Pikeville soils are on higher side slopes adjacent to Smithdale soils. Briley soils have an A horizon more than 20 inches thick, and Pikeville soils have more gravel in the subsoil. Ruston soils, which are on adjacent hilltops, have a bisequal profile. Sacul soils, which are on similar landscapes, have a clayey control section.

Typical pedon of Smithdale fine sandy loam, 3 to 8 percent slopes, in a wooded area in the NE1/4NW1/4SE1/4 sec. 15, T. 8 S., R. 17 W., Dallas County:

A1—0 to 8 inches; dark brown (10YR 4/3) fine sandy loam; weak fine and medium granular structure; very friable; many fine roots; strongly acid; clear smooth boundary.

A2—8 to 16 inches; pale brown (10YR 6/3) fine sandy loam; weak medium granular structure; very friable;

common fine roots; strongly acid; clear smooth boundary.

B21t—16 to 32 inches; red (2.5YR 4/6) sandy clay loam; moderate fine and medium subangular blocky structure; friable; common fine roots; common thin patchy clay films on peds; strongly acid; gradual smooth boundary.

B22t—32 to 48 inches; red (2.5YR 4/6) loam; moderate fine and medium subangular blocky structure; friable; few fine roots; few thin patchy clay films on peds; few fine chert pebbles; strongly acid; clear wavy boundary.

B23t—48 to 64 inches; red (2.5YR 4/8) sandy loam; weak medium subangular blocky structure; friable; few fine roots; sand grains coated and bridged with clay; few fine chert pebbles; strongly acid; clear wavy boundary.

B24t—64 to 80 inches; red (2.5YR 4/8) sandy loam; weak medium subangular blocky structure; friable; sand grains bridged and coated with clay; few pockets of uncoated yellowish red (5YR 5/8) sand grains; strongly acid.

Solum thickness ranges from 60 to more than 100 inches. Reaction is strongly acid or very strongly acid throughout.

The A horizon ranges from 8 to 18 inches in thickness. The A1 horizon has hue of 10YR, value of 4, and chroma of 2 or 3. The A2 horizon has hue of 10YR with value of 5 and chroma of 3, 4, or 6, or with value of 6 and chroma of 3, or it has hue of 7.5YR, value of 4, and chroma of 4.

The upper part of the B2t horizon has hue of 2.5YR or 5YR, value of 4, and chroma of 6 or 8, or it has hue of 5YR, value of 5, and chroma of 6. Texture is sandy loam, loam, or sandy clay loam. The lower part of the B2t horizon has the same colors and textures as the upper part except that it contains few to many pockets of uncoated sand grains.

Smithton series

The Smithton series consists of poorly drained, moderately slowly permeable soils that formed in loamy marine sediments. These level soils are on broad upland flats on the Coastal Plain. They are saturated with water in late winter and early spring. The native vegetation is mixed pines and hardwoods. Slopes are 0 to 1 percent.

Smithton soils are geographically associated with Pheba and Savannah soils. These soils are on higher landscapes than Smithton soils. Pheba soils have a coarse-silty control section, and Savannah soils have a fine-loamy control section. Both soils have a fragipan.

Typical pedon of Smithton fine sandy loam in a wooded area in the SW1/4NE1/4SW1/4 sec. 17, T. 12 S., R. 14 W., Calhoun County:

A1—0 to 4 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; friable; many fine roots; very strongly acid; abrupt smooth boundary.

A2—4 to 12 inches; grayish brown (10YR 5/2) fine sandy loam; few fine faint yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; many fine roots; few fine pebbles; very strongly acid; clear smooth boundary.

B21tg—12 to 30 inches; light brownish gray (10YR 6/2) loam; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; few fine roots; few fine pebbles; few thin patchy clay films on ped faces; very strongly acid; gradual smooth boundary.

B22tg—30 to 45 inches; light brownish gray (10YR 6/2) loam; common medium and coarse distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; few fine roots; few fine pebbles; few thin patchy clay films on ped faces; very strongly acid; gradual wavy boundary.

B23tg—45 to 62 inches; grayish brown (10YR 5/2) loam; common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; few fine roots; few fine pebbles; few thin patchy clay films on ped faces; very strongly acid; gradual wavy boundary.

B24tg—62 to 72 inches; gray (10YR 5/1) loam; common medium and fine distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; few thin patchy clay films on ped faces; few fine pebbles; very strongly acid.

Solum thickness is more than 60 inches. Reaction is strongly acid or very strongly acid throughout.

The A horizon ranges from 8 to 15 inches in thickness. The A1 horizon has hue of 10YR, value of 4 or 5, and chroma of 2. The A2 horizon has hue of 10YR with value of 5 or 6 and chroma of 2, or with value of 5 and chroma of 1.

The B1 horizon, where present, and the B21t horizon have hue of 10YR, value of 6, and chroma of 1 or 2. The B22t and B23t horizons have hue of 10YR, value of 5 or 6, and chroma of 1 or 2. The B horizon has few to many mottles in shades of brown. Texture is fine sandy loam or loam.

Classification of the soils

The system of soil classification currently used was adopted by the National Cooperative Soil Survey in 1965. Readers interested in further details about the system should refer to "Soil taxonomy" (*7*).

The system of classification has six categories. 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 Ultisol.

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 Udults (*Ud*, meaning humid, plus *ult*, from Ultisols).

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 Paleudults (*Pale*, meaning old horizons, plus *Udult*, the suborder of Ultisols that have a udic 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 Paleudults.

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, siliceous, thermic Typic Paleudults.

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

In this section the factors of soil formation are discussed and related to the soils in the survey area. In addition, the processes of soil formation are described.

Factors of soil formation

Soils are formed by the interaction of climate, living organisms, parent material and relief over a period of time. Each of these factors modifies the effect of the other four. Significant differences in any one of the factors result in differences in soil characteristics (*3*).

Climate and living organisms are the active forces in soil formation. Relief, mainly by its influence on runoff and temperature, modifies the effect of climate and living organisms. The parent material also affects the kind of soil that can be formed, and, in extreme cases, determines it almost entirely. Finally, time is needed to change the parent material into soil.

Climate

The climate in Calhoun and Dallas Counties is characterized by long, hot, humid summers; short, mild winters; and abundant rainfall. It probably has not changed much while the soils have been forming. Even though the temperatures may average somewhat lower in the northern part of Dallas County than in the southern part of Calhoun County, the climate is relatively uniform throughout the survey area. Consequently, it does not account for significant differences among the soils.

The warm, moist climate promotes rapid chemical reactions and rapid soil formation. Because of the abundant rainfall, soluble and colloidal materials are readily leached through the soils. Plant remains decompose rapidly, and the organic acids thus produced speed the development of clay minerals and the removal of carbonates. Because the soils freeze only for short periods of time, soil formation continues almost all year.

Living organisms

Among the living organisms important in the formation of soils in Calhoun and Dallas Counties are bacteria, fungi, insects, and the more highly developed flora and fauna. These organisms help to increase the content of organic matter and the supply of nitrogen, to decrease or increase the supply of other plant nutrients, and to change the structure and porosity of the soils.

Before settlement of the counties, native vegetation had more influence on soil development than animal activity. On the flood plains, the trees were mainly hardwoods, chiefly oaks, hickories, sweetgum, ash, and sycamore. Guyton and Ouachita soils formed on flood plains. On the uplands, the trees were chiefly pines, oaks, sweetgum, and hickories. Amy, Pheba, Pikeville, Ruston, Sacul, Savannah, Sawyer, Smithdale, and Smithton soils formed on uplands.

With the development of farming in the counties, man has influenced the formation of the soils by clearing the forests and breaking the sod, tilling the soil, introducing new plants, fertilizing, and improving the timber stand by removing hardwoods and planting pure stands of preferred species.

Parent material

Parent material is the unconsolidated mass from which a soil forms. The soils in Calhoun and Dallas Counties formed mainly in marine sediments of Eocene, Pleistocene, and Recent ages. The sediments of Eocene and Pleistocene ages are deposits of unconsolidated loamy and gravelly material and are on much of the uplands between flood plains. These sediments were deposited when the Gulf of Mexico covered southern and eastern Arkansas. Among the soils that formed in the loamy areas, many contain layers of clayey sediment. These soils include Ruston, Sacul, and Savannah soils. Pikeville soils formed in gravelly material. Guyton and Ouachita soils formed in loamy alluvial sediment of Recent age on flood plains.

Relief

Relief is the differences in elevation of a land surface. Relief affects soil formation through its influence on drainage, erosion, plant cover, and soil temperature. In Calhoun and Dallas Counties, it ranges from level in some places to nearly vertical (bluffs) in others. Slopes are dominantly 1 to 20 percent.

The Coastal Plain upland is characterized by level to moderately steep topography. Slopes are as much as 20 percent, but many are less than 12 percent. On the level to nearly level upland areas, where runoff is slow, the soils are mainly poorly drained or somewhat poorly drained. On the gently sloping to moderately steep upland areas, where runoff is medium to rapid, the soils are mainly moderately well drained or well drained.

The flood plains are long, narrow to wide, and mainly level. In these areas, slopes are mainly less than 1 percent and rarely more than 2 percent. Most of these areas are subject to occasional or frequent floods that deposit more sediment.

Time

The length of time required for formation of soil depends largely upon the other factors of soil formation. Less time generally is required if the climate is warm and humid, the vegetation is luxuriant, and the parent material is loamy. Older soils generally show a greater degree of differentiation between horizons.

The soils of the uplands generally have the most strongly developed argillic horizons and are the most mature soils in Calhoun and Dallas Counties. Soils on flood plains are younger than most soils on uplands.

Processes of soil formation

Most soil profiles contain three major horizons—A, B, and C.

The A horizon is the uppermost layer. The A1 horizon is the horizon of maximum accumulation of organic matter. The A2 horizon is the horizon from which leaching of dissolved or suspended materials has been the greatest.

The B horizon is immediately beneath the A horizon. It contains the maximum accumulation of dissolved or suspended materials, such as iron and clay. The B horizon generally is firmer than the horizons immediately above and below it and commonly has blocky structure (*8*).

The C horizon is beneath the B horizon. In most places, of the soil-forming processes only weathering has affected the C horizon. Some young soils have no B horizon, and the C horizon is immediately below the A horizon. In these soils the C horizon has been slightly modified by living organisms as well as by weathering.

The soils of Calhoun and Dallas Counties have horizons that formed through one or more of the following processes: the accumulation of organic matter, the leaching of bases, the reduction and transfer of iron, and the translocation of silicate clay minerals. In most of the soils, more than one of these processes was involved.

Accumulation of organic matter in the uppermost part of the profile has been important in horizon development. The A1 horizon is darker than the A2 horizon because it contains more organic matter. Organic matter as well as clay minerals and iron oxide have been removed from the A2 horizon. The content of organic matter ranges from very low to moderate in most soils of Calhoun and Dallas Counties.

Most of the soils of the counties have been leached of carbonates. The leaching of bases generally precedes the translocation of silicate clay minerals.

Reduction and transfer of iron are evident in all of the somewhat poorly drained and poorly drained soils. This process is called gleying. Gray colors in the layers below the surface layer are evidence of the reduction and loss of iron. Mottles of red, brown, and yellow in some horizons and iron concretions in others are made up of segregated iron compounds in complex with organic matter and oxides of manganese or other metals. Gleying has been important in the formation of Guyton and Smithton soils.

Translocation, or downward movement, of clay minerals has contributed to horizon development in most of the soils. The eluviated A2 horizon contains less clay and generally is lighter colored than the B horizon. Clay has accumulated in the B horizon in the form of clay films in pores and on ped surfaces. In most soils the C horizon contains less clay than the B horizon.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly such soil formed in recent alluvium or on steep rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim. An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 3
Low	3 to 6
Medium	6 to 9
High	More than 9

Base saturation. The degree to which material having base exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the exchange capacity.

Bedding planes. Fine stratifications, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediments.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Bottom land. The normal flood plain of a stream, subject to frequent flooding.

Calcareous soil. A soil containing enough calcium carbonate (commonly with magnesium carbonate) to effervesce (fizz) visibly when treated with cold, dilute hydrochloric acid. A soil having measurable amounts of calcium carbonate or magnesium carbonate.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity, but is more precise in meaning.

Chiseling. Tillage with an implement having one or more soil-penetrating points that loosen the subsoil and bring clods to the surface. A form of emergency tillage to control soil blowing.

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.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Coarse textured (light textured) soil. Sand or loamy sand.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures is difficult.

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.

Compressible. Excessive decrease in volume of soft soil under load.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping (or contour farming). Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is 40 or 80 inches (1 or 2 meters).

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave. Unstable walls of cuts made by earthmoving equipment. The soil sloughs easily.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically 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.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Erosion. The wearing away of the land surface by running water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes a bare surface.

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.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine textured (heavy textured) soil. Sandy clay, silty clay, and clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

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.

Foot slope. The inclined surface at the base of a hill.

Forage. Plant material used as feed by domestic animals. Forage can be grazed or cut for hay.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Gleyed soil. A soil having one or more neutral gray horizons as a result of waterlogging and lack of oxygen. The term "gleyed" also designates gray horizons and horizons having yellow and gray mottles as a result of intermittent waterlogging.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material from 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.5 centimeters) in diameter.

Green manure (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table, which is the upper limit of saturation.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

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.

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 of 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.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered, but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Leaching. The removal of soluble material from soil or other material by percolating water.

Light textured soil. Sand and loamy sand.

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.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. Inadequate strength for supporting loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is greater than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Moderately coarse textured (moderately light textured) soil. Sandy loam and fine sandy loam.

Moderately fine textured (moderately heavy textured) soil. Clay loam, sandy clay loam, and silty clay loam.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3.

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.

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 0.2 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 basis of differences in slope, stoniness, thickness, or some other characteristic 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 forms 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.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Polypedon. A volume of soil having properties within the limits of a soil series, the lowest and most homogeneous category of soil taxonomy. A "soil individual."

Poorly graded. Refers to soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor outlets. Surface or subsurface drainage outlets difficult or expensive to install.

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.

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulates over disintegrating rock.

Rill. A steep sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rooting depth. Shallow root zone. The soil is shallow over a layer that greatly restricts roots. See Root zone.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged in stream channels from a drainage area. The water that flows off the land surface without sinking in is called surface runoff; that which enters the ground before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-size particles.

Seepage. The rapid movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon.

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.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and runoff water.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Small stones. Rock fragments 3 to 10 inches (7.5 to 25 centimeters) in diameter. Small stones adversely affect the specified use.

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.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows: *very coarse sand* (2.0 millimeters to 1.0 millimeter); *coarse sand* (1.0 to 0.5 millimeter); *medium sand* (0.5 to 0.25 millimeter); *fine sand* (0.25 to 0.10 millimeter); *very fine sand* (0.10 to 0.05 millimeter); *silt* (0.05 to 0.002 millimeter); and *clay* (less than 0.002 millimeter).

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.

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates 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).

Stubble mulch. Stubble or other crop residue left on the soil, or partly worked into the soil, to provide protection from soil blowing and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

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.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea. A stream terrace is frequently called a second bottom, in contrast with a flood plain, and is seldom subject to overflow. A marine terrace, generally wide, was deposited by the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt, 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.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

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.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Unstable fill. Risk of caving or sloughing in banks of fill material.

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.

Well graded. Refers to a soil or soil material consisting of particles well distributed over a wide range in size or diameter. Such a soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

TABLES

TABLE 1.--ACREAGE OF PRINCIPAL CROPS FOR STATED YEARS

Crops	Calhoun County		Dallas County	
	1969	1974	1969	1974
Corn	771	509	325	104
Soybeans (for beans)	1,670	46	1,178	1,540
Hay	1,592	2,325	1,592	2,373
Cotton	469	0	1,148	982
Small grains	138	4	109	300

TABLE 2.--NUMBER OF LIVESTOCK IN STATED YEARS

Livestock and poultry	Calhoun County		Dallas County	
	1969	1974	1969	1974
All cattle and calves	5,254	7,057	4,935	6,725
Hogs and pigs	524	408	1,050	390
Chickens (more than 3 months old)	219,739	69,379	175,305	63,758

TABLE 3.--TEMPERATURE AND PRECIPITATION DATA

[Data were recorded in the period 1951-75 at Fordyce, Arkansas]

Month	Temperature						Precipitation				
	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[1]	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----	54.6	33.5	44.1	77	9	40	4.49	2.36	6.23	7	1.4
February---	58.7	35.7	47.2	78	15	72	4.22	2.20	5.86	6	1.1
March------	66.7	42.3	54.5	87	19	224	4.99	2.71	6.84	7	.4
April------	76.4	51.6	64.0	90	30	420	5.44	2.39	7.92	7	.0
May--------	83.5	59.1	71.2	94	42	657	4.76	2.50	6.60	6	.0
June-------	90.5	66.6	78.6	99	51	858	3.25	1.04	5.00	5	.0
July-------	93.3	69.6	81.5	103	56	977	4.12	2.28	5.61	6	.0
August-----	92.7	68.8	80.7	102	57	952	3.11	1.21	4.64	5	.0
September--	86.6	62.7	74.6	99	43	738	3.82	1.91	5.38	5	.0
October----	77.3	51.8	64.5	93	32	456	3.03	1.12	4.59	4	.0
November---	64.7	41.5	53.1	83	20	137	4.37	2.43	5.94	6	.0
December---	55.9	35.5	45.7	78	13	68	5.00	3.00	6.79	7	.9
Yearly:											
Average--	75.1	51.6	63.3	---	---	---	---	---	---	---	---
Extreme--	---	---	---	104	6	---	---	---	---	---	---
Total----	---	---	---	---	---	5,599	50.60	43.59	57.30	71	3.8

[1]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 4.--FREEZE DATES IN SPRING AND FALL

[Data were recorded in the period 1951-75 at Fordyce, Arkansas]

Probability	Temperature		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	March 23	March 30	April 11
2 years in 10 later than--	March 14	March 23	April 5
5 years in 10 later than--	February 25	March 9	March 26
First freezing temperature in fall:			
1 year in 10 earlier than--	November 9	November 3	October 21
2 years in 10 earlier than--	November 16	November 8	October 26
5 years in 10 earlier than--	November 30	November 17	November 4

TABLE 5.--GROWING SEASON LENGTH

[Data were recorded in the period 1951-75 at Fordyce, Arkansas]

Probability	Daily minimum temperature during growing season		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10--	246	224	200
8 years in 10--	257	233	207
5 years in 10--	277	252	222
2 years in 10--	297	270	237
1 year in 10---	308	280	245

TABLE 6.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Calhoun County	Dallas County	Total-- Area	Total-- Extent
		Acres	Acres	Acres	Pct
1	Amy silt loam	78,607	38,780	117,387	14.1
2	Bonn silt loam	375	0	375	*
3	Briley loamy fine sand, 3 to 8 percent slopes	1,360	770	2,130	0.3
4	Briley loamy fine sand, 8 to 12 percent slopes	520	1,805	2,325	0.3
5	Guyton soils, frequently flooded	97,160	98,300	195,460	23.7
6	Ouachita soils, frequently flooded	5,855	8,670	14,525	1.7
7	Pheba silt loam, 0 to 2 percent slopes	32,099	19,445	51,544	6.2
8	Pheba-Savannah association, gently rolling	0	21,310	21,310	2.6
9	Pikeville fine sandy loam, 1 to 3 percent slopes	600	2,095	2,695	0.3
10	Pikeville fine sandy loam, 3 to 8 percent slopes	8,913	17,475	26,388	3.2
11	Pikeville fine sandy loam, 8 to 12 percent slopes	3,055	15,520	18,575	2.2
12	Pikeville association, gently rolling	0	3,360	3,360	0.4
13	Pikeville association, rolling	0	11,805	11,805	1.4
14	Ruston fine sandy loam, 1 to 3 percent slopes	11,112	5,800	16,912	2.0
15	Sacul fine sandy loam, 1 to 3 percent slopes	590	1,710	2,300	0.3
16	Sacul fine sandy loam, 3 to 8 percent slopes	10,040	8,425	18,465	2.2
17	Sacul fine sandy loam, 8 to 12 percent slopes	3,505	5,470	8,975	1.1
18	Sacul association, rolling	0	10,445	10,445	1.3
19	Sacul-Sawyer association, gently rolling	0	22,530	22,530	2.7
20	Sacul-Smithdale association, gently rolling	0	20,265	20,265	2.4
21	Savannah fine sandy loam, 1 to 3 percent slopes	38,628	14,190	52,818	6.3
22	Savannah fine sandy loam, 3 to 8 percent slopes	10,660	12,390	23,050	2.8
23	Sawyer silt loam, 1 to 3 percent slopes	540	1,445	1,985	0.2
24	Sawyer silt loam, 3 to 8 percent slopes	845	5,675	6,520	0.8
25	Smithdale fine sandy loam, 3 to 8 percent slopes	11,219	10,700	21,919	2.6
26	Smithdale fine sandy loam, 8 to 12 percent slopes	435	4,105	4,540	0.5
27	Smithdale association, gently rolling	0	7,815	7,815	0.9
28	Smithdale association, rolling	0	8,690	8,690	1.0
29	Smithdale-Sacul association, rolling	0	16,870	16,870	2.0
30	Smithton fine sandy loam	78,481	9,780	88,261	10.6
31	Smithton-Pheba association	0	23,745	23,745	2.9
32	Udorthents, loamy	6,241	0	6,241	0.7
	Water	1,464	695	2,159	0.3
	Total	402,304	430,080	832,384	100.0

* Less than 0.1 percent.

TABLE 7.--YIELDS PER ACRE OF CROPS AND PASTURE

[Absence of a yield figure indicates the crop is seldom grown or is not suited]

Soil name and map symbol	Soybeans	Corn	Bahiagrass	Common bermudagrass	Improved bermudagrass	Tall fescue
	Bu	Bu	AUM*	AUM*	AUM*	AUM*
1 Amy	25	---	7.5	6.0	---	6.0
2 Bonn	---	---	---	---	---	---
3 Briley	---	---	---	---	6.5	---
4 Briley	---	40	---	---	6.5	---
5 Guyton	---	---	---	5.0	---	---
6 Ouachita	35	---	7.0	7.0	9.0	---
7 Pheba	30	75	7.5	7.0	8.5	7.0
8**:						
Pheba	30	75	7.5	7.0	8.5	7.0
Savannah	35	75	8.5	7.0	8.5	8.0
9, 10 Pikeville	25	60	7.5	6.5	7.5	6.5
11 Pikeville	---	---	7.0	6.0	7.0	5.5
12** Pikeville	25	60	7.5	6.5	7.5	6.5
13** Pikeville	---	---	7.0	6.0	7.0	5.5
14 Ruston	30	70	9.0	7.0	11.0	6.5
15 Sacul	25	---	7.0	6.0	7.0	---
16 Sacul	---	---	7.0	6.0	7.0	---
17 Sacul	---	---	6.0	5.5	6.5	---
18** Sacul	---	---	6.0	5.5	6.5	---
19**:						
Sacul	---	---	7.0	6.0	7.0	---
Sawyer	20	45	7.5	6.5	8.0	7.0
20**:						
Sacul	---	---	7.0	6.0	7.0	---
Smithdale	25	65	8.0	6.5	10.0	6.5

See footnotes at end of table.

TABLE 7.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Soybeans	Corn	Bahiagrass	Common bermudagrass	Improved bermudagrass	Tall fescue
	Bu	Bu	AUM*	AUM*	AUM*	AUM*
21----------------------- Savannah	35	75	8.5	7.0	8.5	8.0
22----------------------- Savannah	30	70	8.5	7.0	8.5	7.5
23----------------------- Sawyer	25	50	7.5	6.5	8.5	7.0
24----------------------- Sawyer	20	45	7.5	6.5	8.5	7.0
25----------------------- Smithdale	25	65	7.5	6.5	10.0	6.5
26----------------------- Smithdale	---	50	7.0	6.0	9.0	5.5
27**--------------------- Smithdale	25	65	7.5	6.5	10.0	6.5
28**--------------------- Smithdale	---	---	7.0	6.0	9.0	5.5
29**:						
Smithdale----------------	---	---	7.0	6.0	9.0	5.5
Sacul--------------------	---	---	6.0	5.5	6.5	---
30----------------------- Smithton	25	---	7.5	7.0	---	7.0
31**:						
Smithton-----------------	25	---	7.5	7.0	---	7.0
Pheba--------------------	30	75	7.5	7.0	8.5	7.0

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for a period of 30 days.

** See map unit description for the composition and behavior of the map unit.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed in this table. Site index was calculated at age 30 for eastern cottonwood, at age 35 for American sycamore, and at age 50 for all other species]

Soil name and map symbol	Woodland suitability group	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Potential productivity: Common trees	Potential productivity: Site index	Trees to plant
1------------------- Amy	2w9	Slight	Severe	Severe	Loblolly pine-------- Shortleaf pine------- Sweetgum------------	90 80 90	Loblolly pine. sweetgum.
3, 4---------------- Briley	3s3	Slight	Slight	Severe	Loblolly pine-------- Shortleaf pine-------	80 70	Loblolly pine,
5*------------------ Guyton	2w9	Slight	Severe	Moderate	Loblolly pine-------- Sweetgum------------ Green ash----------- Southern red oak----- Water oak------------	90 --- --- --- ---	Loblolly pine, sweetgum.
6*------------------ Ouachita	1w8	Slight	Moderate	Slight	Loblolly pine-------- Sweetgum------------ Eastern cottonwood--	100 100 100	Loblolly pine, sweetgum, Nuttall oak, American sycamore, eastern cottonwood.
7------------------- Pheba	2w8	Slight	Moderate	Slight	Loblolly pine-------- Shortleaf pine------- Sweetgum------------	90 80 90	Loblolly pine.
8*:							
Pheba---------------	2w8	Slight	Moderate	Slight	Loblolly pine-------- Shortleaf pine------- Sweetgum------------	90 80 90	Loblolly pine.
Savannah------------	3o7	Slight	Slight	Slight	Loblolly pine-------- Shortleaf pine------- Southern red oak-----	81 76 75	Loblolly pine.
9, 10, 11, 12*, 13*----------------- Pikeville	3o1	Slight	Slight	Slight	Loblolly pine--------	80	Loblolly pine.
14------------------ Ruston	3o1	Slight	Slight	Slight	Loblolly pine-------- Shortleaf pine-------	84 75	Loblolly pine.
15, 16, 17, 18*----- Sacul	3c2	Moderate	Slight	Slight	Loblolly pine-------- Shortleaf pine-------	80 70	Loblolly pine, shortleaf pine.
19*:							
Sacul---------------	3c2	Moderate	Slight	Slight	Loblolly pine-------- Shortleaf pine-------	80 70	Loblolly pine, shortleaf pine.
Sawyer--------------	2w8	Slight	Moderate	Slight	Loblolly pine-------- Shortleaf pine------- Sweetgum------------	90 80	Loblolly pine, shortleaf pine, sweetgum.
20*:							
Sacul---------------	3c2	Moderate	Slight	Slight	Loblolly pine-------- Shortleaf pine-------	80 70	Loblolly pine, shortleaf pine.
Smithdale-----------	3o1	Slight	Slight	Slight	Loblolly pine-------- Shortleaf pine-------	80 69	Loblolly pine.
21, 22:							
Savannah------------	3o7	Slight	Slight	Slight	Loblolly pine-------- Shortleaf pine------- Southern red oak-----	81 76 75	Loblolly pine.

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Woodland suitability group	Management concerns			Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	
23, 24 Sawyer	2w8	Slight	Moderate	Slight	Loblolly pine Shortleaf pine Sweetgum	90 80 90	Loblolly pine, shortleaf pine, sweetgum.
25, 26, 27, 28 Smithdale	3o1	Slight	Slight	Slight	Loblolly pine Shortleaf pine	80 69	Loblolly pine.
29*: Smithdale	3o1	Slight	Slight	Slight	Loblolly pine Shortleaf pine	80 69	Loblolly pine.
Sacul	3c2	Moderate	Slight	Slight	Loblolly pine Shortleaf pine	80 70	Loblolly pine, shortleaf pine.
30 Smithton	2w9	Slight	Severe	Severe	Loblolly pine Shortleaf pine Sweetgum Cherrybark oak Water oak	90 80 90 90 90	Loblolly pine, sweetgum, cherrybark oak, Shumard oak.
31*: Smithton	2w9	Slight	Severe	Severe	Loblolly pine Shortleaf pine Sweetgum Cherrybark oak Water oak	90 80 90 90 90	Loblolly pine, sweetgum, cherrybark oak, Shumard oak.
Pheba	2w8	Slight	Moderate	Slight	Loblolly pine Shortleaf pine Sweetgum	90 80 90	Loblolly pine.

* See map unit description for the composition and behavior of the map unit.

TABLE 9.--BUILDING SITE DEVELOPMENT

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe"]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
1 Amy	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
2 Bonn	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
3 Briley	Slight	Slight	Slight	Moderate: slope.	Moderate: low strength.
4 Briley	Moderate: slope.	Slight	Slight	Severe: slope.	Moderate: low strength.
5* Guyton	Severe: floods, wetness, cutbanks cave.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.
6* Ouachita	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.
7 Pheba	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: low strength, wetness.
8*:					
Pheba	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: low strength, wetness.
Savannah	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, corrosive.	Moderate: low strength.
9 Pikeville	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: low strength.
10 Pikeville	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Moderate: low strength.
11 Pikeville	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, low strength.
12* Pikeville	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Moderate: low strength.
13* Pikeville	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, low strength.
14 Ruston	Slight	Slight	Slight	Slight	Moderate: low strength.
15, 16 Sacul	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.
17, 18* Sacul	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: slope, low strength, shrink-swell.	Severe: low strength, shrink-swell.

See footnote at end of table.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
19*:					
Sacul	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.
Sawyer	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell, wetness.	Severe: low strength, shrink-swell, wetness.	Severe: low strength, shrink-swell.
20*:					
Sacul	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.
Smithdale	Slight	Slight	Slight	Moderate: slope.	Slight.
21 Savannah	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: low strength.
22 Savannah	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, slope.	Moderate: low strength.
23, 24 Sawyer	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell, wetness.	Severe: low strength, shrink-swell, wetness.	Severe: low strength, shrink-swell.
25 Smithdale	Slight	Slight	Slight	Moderate: slope.	Slight.
26 Smithdale	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
27* Smithdale	Slight	Slight	Slight	Moderate: slope.	Slight.
28* Smithdale	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
29*:					
Smithdale	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
Sacul	Severe: too clayey.	Severe: low strength, shrink-swell.	Severe: low strength, shrink-swell.	Severe: slope, low strength, shrink-swell.	Severe: low strength, shrink-swell.
30 Smithton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
31*:					
Smithton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Pheba	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: low strength, wetness.
32. Udorthents					

* See map unit description for the composition and behavior of the map unit.

TABLE 10.--SANITARY FACILITIES

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms used to rate soils]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
1 Amy	Severe: percs slowly, wetness.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
2 Bonn	Severe: percs slowly, wetness.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
3 Briley	Slight	Moderate: seepage.	Slight	Slight	Fair: too sandy.
4 Briley	Moderate: slope.	Severe: slope.	Slight	Slight	Fair: too sandy, slope.
5* Guyton	Severe: floods, wetness, percs slowly.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Poor: wetness.
6* Ouachita	Severe: floods, percs slowly.	Severe: floods.	Severe: floods.	Severe: floods.	Fair: too clayey.
7 Pheba	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Severe: wetness.	Fair: thin layer.
8*:					
Pheba	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Severe: wetness.	Fair: thin layer.
Savannah	Severe: percs slowly.	Moderate: slope.	Slight	Slight	Good.
9, 10 Pikeville	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: thin layer, small stones.
11 Pikeville	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: slope, thin layer, small stones.
12* Pikeville	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: thin layer, small stones.
13* Pikeville	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: slope, thin layer, small stones.
14 Ruston	Slight	Moderate: seepage, slope.	Slight	Slight	Good.
15, 16 Sacul	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey.
17, 18* Sacul	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey.

See footnote at end of table.

TABLE 10.--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
19*:					
Sacul	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey.
Sawyer	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Fair: too clayey, thin layer.
20*:					
Sacul	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey.
Smithdale	Slight	Severe: seepage.	Slight	Slight	Good.
21, 22 Savannah	Severe: percs slowly.	Moderate: slope.	Slight	Slight	Good.
23, 24 Sawyer	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Fair: too clayey, thin layer.
25 Smithdale	Slight	Severe: seepage.	Slight	Slight	Good.
26 Smithdale	Moderate: slope.	Severe: seepage, slope.	Slight	Moderate: slope.	Fair: slope.
27* Smithdale	Slight	Severe: seepage.	Slight	Slight	Good.
28* Smithdale	Moderate: slope.	Severe: seepage, slope.	Slight	Moderate: slope.	Fair: slope.
29*:					
Smithdale	Moderate: slope.	Severe: seepage, slope.	Slight	Moderate: slope.	Fair: slope.
Sacul	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey.
30 Smithton	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
31*:					
Smithton	Severe: percs slowly, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Pheba	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Severe: wetness.	Fair: thin layer.
32. Udorthents					

* See map unit description for the composition and behavior of the map unit.

TABLE 11.--CONSTRUCTION MATERIALS

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," and "unsuited"]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
1---------------------- Amy	Poor: wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
2---------------------- Bonn	Poor: wetness, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness, excess sodium.
3---------------------- Briley	Fair: low strength.	Poor: excess fines.	Unsuited: excess fines.	Fair: too sandy.
4---------------------- Briley	Fair: low strength.	Poor: excess fines.	Unsuited: excess fines.	Fair: too sandy, slope.
5*--------------------- Guyton	Poor: wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
6*--------------------- Ouachita	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
7---------------------- Pheba	Fair: low strength, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
8*:				
Pheba-----------------	Fair: low strength, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Savannah--------------	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
9, 10------------------ Pikeville	Fair: low strength.	Unsuited: excess fines, small stones.	Fair: excess fines.	Fair: small stones.
11--------------------- Pikeville	Fair: low strength.	Unsuited: excess fines, small stones.	Fair: excess fines.	Fair: slope, small stones.
12*-------------------- Pikeville	Fair: low strength.	Unsuited: excess fines, small stones.	Fair: excess fines.	Fair: small stones.
13*-------------------- Pikeville	Fair: low strength.	Unsuited: excess fines, small stones.	Fair: excess fines.	Fair: slope, small stones.
14--------------------- Ruston	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
15, 16, 17, 18*-------- Sacul	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, too clayey.
19*:				
Sacul-----------------	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, too clayey.
Sawyer----------------	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
20*:				
Sacul	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, too clayey.
Smithdale	Good	Unsuited: excess fines.	Unsuited: excess fines.	Good.
21, 22 Savannah	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
23, 24 Sawyer	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey.
25 Smithdale	Good	Unsuited: excess fines.	Unsuited: excess fines.	Good.
26 Smithdale	Good	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope.
27* Smithdale	Good	Unsuited: excess fines.	Unsuited: excess fines.	Good.
28* Smithdale	Good	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope.
29*:				
Smithdale	Good	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope.
Sacul	Poor: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, too clayey.
30 Smithton	Poor: wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
31*:				
Smithton	Poor: wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
Pheba	Fair: low strength, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
32*. Udorthents				

* See map unit description for the composition and behavior of the map unit.

TABLE 12.--WATER MANAGEMENT

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe"]

Soil name and map symbol	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
1 Amy	Slight	Moderate: compressible, low strength, piping.	Percs slowly	Slow intake, percs slowly, wetness.	Not needed	Percs slowly, wetness.
2 Bonn	Slight	Moderate: piping, erodes easily.	Cutbanks cave, percs slowly.	Droughty, excess sodium, wetness.	Not needed	Droughty, erodes easily, excess sodium.
3, 4 Briley	Moderate: seepage.	Moderate: piping, low strength.	Not needed	Fast intake, slope.	Too sandy, piping, slope.	Droughty, erodes easily, slope.
5* Guyton	Slight	Moderate: erodes easily, low strength, compressible.	Cutbanks cave, floods, percs slowly.	Percs slowly	Not needed	Wetness.
6* Ouachita	Moderate: seepage.	Moderate: compressible, piping.	Not needed	Floods	Not needed	Not needed.
7 Pheba	Moderate: seepage.	Moderate	Percs slowly	Slow intake, wetness.	Not needed	Favorable.
8*:						
Pheba	Moderate: seepage.	Moderate	Percs slowly	Slow intake, wetness.	Not needed	Favorable.
Savannah	Moderate: seepage.	Moderate: low strength, piping.	Percs slowly, slope.	Percs slowly	Percs slowly, erodes easily.	Percs slowly.
9, 10, 11, 12*, 13* Pikeville	Severe: seepage.	Severe: seepage, piping.	Not needed	Erodes easily, slope, fast intake.	Erodes easily, slope.	Erodes easily, slope.
14 Ruston	Moderate: seepage.	Slight	Not needed	Slope	Favorable	Favorable.
15, 16, 17, 18* Sacul	Slight	Moderate: compressible, low strength.	Not needed	Erodes easily, slow intake, slope.	Slope, erodes easily, percs slowly.	Erodes easily, percs slowly, slope.
19*:						
Sacul	Slight	Moderate: compressible, low strength.	Not needed	Erodes easily, slow intake, slope.	Slope, erodes easily, percs slowly.	Erodes easily, percs slowly, slope.
Sawyer	Slight	Moderate: low strength, compressible.	Not needed	Slow intake, slope.	Favorable	Favorable.
20*:						
Sacul	Slight	Moderate: compressible, low strength.	Not needed	Erodes easily, slow intake, slope.	Slope, erodes easily, percs slowly.	Erodes easily, percs slowly, slope.
Smithdale	Severe: seepage.	Moderate: piping, unstable fill.	Not needed	Fast intake, seepage, complex slope.	Favorable	Favorable.
21, 22 Savannah	Moderate: seepage.	Moderate: low strength, piping.	Percs slowly, slope.	Percs slowly	Percs slowly, erodes easily.	Percs slowly.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
23, 24. Sawyer	Slight	Moderate: low strength, compressible.	Not needed	Slow intake, slope.	Favorable	Favorable.
25. Smithdale	Severe: seepage.	Moderate: piping, unstable fill.	Not needed	Fast intake, seepage, complex slope.	Favorable	Favorable.
26. Smithdale	Severe: seepage.	Moderate: piping, unstable fill.	Not needed	Fast intake, seepage, complex slope.	Slope, erodes easily.	Slope, erodes easily.
27*. Smithdale	Severe: seepage.	Moderate: piping, unstable fill.	Not needed	Fast intake, seepage, complex slope.	Favorable	Favorable.
28*. Smithdale	Severe: seepage.	Moderate: piping, unstable fill.	Not needed	Fast intake, seepage, complex slope.	Slope, erodes easily.	Slope, erodes easily.
29*: Smithdale	Severe: seepage.	Moderate: piping, unstable fill.	Not needed	Fast intake, seepage, complex slope.	Slope, erodes easily.	Slope, erodes easily.
Sacul	Slight	Moderate: compressible, low strength.	Not needed	Erodes easily, slow intake, slope.	Slope, erodes easily, percs slowly.	Erodes easily, percs slowly, slope.
30. Smithton	Moderate: seepage.	Moderate: unstable fill, piping.	Favorable	Wetness	Wetness	Wetness.
31*: Smithton	Moderate: seepage.	Moderate: unstable fill, piping.	Favorable	Wetness	Wetness	Wetness.
Pheba	Moderate: seepage.	Moderate	Percs slowly	Slow intake, wetness.	Not needed	Favorable.
32. Udorthents						

* See map unit description for the composition and behavior of the map unit.

TABLE 13.--RECREATIONAL DEVELOPMENT

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe"]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
1 Amy	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
2 Bonn	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, percs slowly.	Severe: wetness.
3 Briley	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.
4 Briley	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.
5* Guyton	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.
6* Ouachita	Severe: floods.	Moderate: floods.	Severe: floods.	Moderate: floods.
7 Pheba	Moderate: percs slowly.	Moderate: wetness.	Moderate: wetness, percs slowly.	Moderate: wetness.
8*:				
Pheba	Moderate: percs slowly.	Moderate: wetness.	Moderate: wetness, percs slowly.	Moderate: wetness.
Savannah	Slight	Slight	Moderate: slope.	Slight.
9, 10 Pikeville	Slight	Slight	Moderate: slope.	Slight.
11 Pikeville	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
12* Pikeville	Slight	Slight	Moderate: slope.	Slight.
13* Pikeville	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
14 Ruston	Slight	Slight	Moderate: slope.	Slight.
15, 16 Sacul	Moderate: percs slowly.	Slight	Moderate: slope, percs slowly.	Slight.
17, 18* Sacul	Moderate: slope, percs slowly.	Moderate: slope.	Severe: slope.	Slight.
19*:				
Sacul	Moderate: percs slowly.	Slight	Moderate: slope, percs slowly.	Slight.

See footnote at end of table.

TABLE 13.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
19*:				
Sawyer	Moderate: percs slowly.	Slight	Moderate: slope, percs slowly.	Slight.
20:				
Sacul	Moderate: percs slowly.	Slight	Moderate: slope, percs slowly.	Slight.
Smithdale	Slight	Slight	Moderate: slope.	Slight.
21, 22 Savannah	Slight	Slight	Moderate: slope.	Slight.
23, 24 Sawyer	Moderate: percs slowly.	Slight	Moderate: slope, percs slowly.	Slight.
25 Smithdale	Slight	Slight	Moderate: slope.	Slight.
26 Smithdale	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
27* Smithdale	Slight	Slight	Moderate: slope.	Slight.
28* Smithdale	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
29*:				
Smithdale	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Sacul	Moderate: slope, percs slowly.	Moderate: slope.	Severe: slope.	Slight.
30 Smithton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
31*:				
Smithton	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Pheba	Moderate: percs slowly.	Moderate: wetness.	Moderate: wetness, percs slowly.	Moderate: wetness.
32*. Udorthents				

* See map unit description for the composition and behavior of the map unit.

TABLE 14.--WILDLIFE HABITAT POTENTIALS

[See text for definitions of "good," "fair," "poor," and "very poor"]

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
1 Amy	Poor	Fair	Fair	Good	Fair	Good	Good	Fair	Good	Good.
2 Bonn	Poor	Poor	Poor	Poor	Poor	Poor	Good	Poor	Poor	Fair.
3, 4 Briley	Poor	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
5* Guyton	Poor	Fair	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
6* Ouachita	Poor	Fair	Fair	Good	Poor	Good	Fair	Fair	Good	Fair.
7 Pheba	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
8*:										
Pheba	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Savannah	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
9, 10, 11, 12*, 13* Pikeville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
14 Ruston	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
15 Sacul	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
16 Sacul	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
17, 18* Sacul	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
19*:										
Sacul	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Sawyer	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
20*:										
Sacul	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Smithdale	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
21 Savannah	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
22 Savannah	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
23 Sawyer	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
24 Sawyer	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 14.--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
25, 26 Smithdale	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
27* Smithdale	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
28* Smithdale	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
29*:										
Smithdale	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Sacul	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
30 Smithton	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
31*:										
Smithton	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
Pheba	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
32. Udorthents										

* See map unit description for the composition and behavior of the map unit.

TABLE 15.--ENGINEERING PROPERTIES AND CLASSIFICATIONS

[The symbol < means less than; > means greater than. Absence of an entry means data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
1------------------- Amy	0-20	Silt loam-------	ML, CL-ML	A-4	0	100	95-100	90-100	70-95	<30	NP-5
	20-40	Silt loam, silty clay loam.	CL	A-4, A-6	0	100	95-100	95-100	85-95	25-40	8-20
	40-72	Fine sandy loam, silt loam, silty clay loam.	ML, SM, CL-ML, CL	A-4, A-6	0	100	95-100	80-95	40-90	<35	NP-20
2------------------- Bonn	0-12	Silt loam-------	ML, CL-ML	A-4	0	100	100	95-100	75-100	20-30	2-7
	12-60	Silt loam, silty clay loam.	CL	A-6	0	95-100	90-100	85-100	65-100	30-40	12-22
	60-72	Silt loam, silty clay loam.	CL	A-6, A-4	0	100	95-100	90-100	75-100	28-38	8-18
3, 4---------------- Briley	0-24	Loamy fine sand	SM	A-2-4, A-4	0	97-100	95-100	80-98	17-45	<25	NP-4
	24-72	Fine sandy loam, sandy clay loam.	SC, CL	A-4, A-6	0	95-100	95-100	85-98	36-55	22-39	8-22
5*------------------ Guyton	0-19	Silt loam-------	ML, CL-ML	A-4	0	100	100	95-100	65-90	<27	NP-7
	19-72	Silt loam, silty clay loam, clay loam.	CL, CL-ML	A-6, A-4	0	100	100	95-100	75-95	26-40	6-18
6*------------------ Ouachita	0-19	Silt loam-------	ML, CL, CL-ML	A-4, A-6	0	100	100	85-100	75-95	<30	NP-12
	19-68	Silt loam, loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6	0	100	100	85-100	80-100	25-40	5-20
	68-76	Fine sandy loam, silt loam, loamy fine sand.	SM, ML, CL-ML, SM-SC	A-4, A-2	0	100	100	50-95	20-75	<30	NP-5
7------------------- Pheba	0-8	Silt loam-------	ML, CL, CL-ML	A-4	0	100	100	85-100	55-90	<25	NP-8
	8-29	Silt loam, loam	ML, CL, CL-ML	A-4	0	100	100	90-100	75-90	<25	NP-8
	29-72	Silt loam, loam, silty clay loam.	CL, ML	A-6, A-4	0	100	100	90-100	75-95	30-40	11-16
8*:											
Pheba-------------	0-8	Silt loam-------	ML, CL, CL-ML	A-4	0	100	100	85-100	55-90	<25	NP-8
	8-29	Silt loam, loam	ML, CL, CL-ML	A-4	0	100	100	90-100	75-90	<25	NP-8
	29-72	Silt loam, loam, silty clay loam.	CL, ML	A-6, A-4	0	100	100	90-100	75-95	30-40	11-16
Savannah----------	0-9	Fine sandy loam	SM, ML	A-2-4, A-4	0	100	100	60-85	30-55	<25	NP-4
	9-27	Sandy clay loam, clay loam, loam.	CL, SC, CL-ML	A-4, A-6	0	100	100	80-100	40-80	23-40	7-19
	27-72	Loam, clay loam, sandy loam.	CL, SC, CL-ML	A-4, A-6, A-7	0	100	100	80-100	40-80	23-43	7-19

See footnote at end of table.

TABLE 15.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
9, 10, 11, 12*, 13*: Pikeville	0-15	Fine sandy loam	SM, ML	A-4	0	90-100	90-100	50-85	36-60	<30	NP-4
	15-28	Sandy clay loam, loam, gravelly loam.	SC, CL, SM-SC	A-4, A-6	0	80-100	65-100	60-90	36-60	20-40	4-17
	28-80	Very gravelly fine sandy loam, gravelly loam, gravelly sandy clay loam	GW-GM, GM, SW-SM, SM	A-1-B, A-2, A-4, A-6	0	35-90	20-85	15-75	9-45	25-48	2-18
14: Ruston	0-15	Fine sandy loam	SM, ML	A-4, A-2-4	0	85-100	78-100	65-100	30-75	<20	NP-3
	15-55	Fine sandy loam, sandy loam.	SM, ML, CL-ML, SM-SC	A-4, A-2	0	85-100	78-100	65-100	30-75	<27	NP-7
	55-80	Sandy clay loam, loamy sand, sand.	SC, SM, SM-SC, SP-SM	A-2	0	85-100	78-100	50-100	5-35	<30	NP-7
15, 16, 17, 18*: Sacul	0-8	Fine sandy loam	SM, ML	A-4	0	95-100	90-100	80-100	40-65	<20	NP-3
	8-36	Clay, silty clay	CH, MH, CL	A-7	0	95-100	90-100	85-95	80-90	45-70	20-40
	36-72	Silty clay loam, silt loam, clay loam.	CL, CH, ML, SC	A-6, A-7, A-4	0	95-100	90-100	85-100	40-90	25-55	8-32
19*: Sacul	0-8	Fine sandy loam	SM, ML	A-4	0	95-100	90-100	80-100	40-65	<20	NP-3
	8-36	Clay, silty clay	CH, MH, CL	A-7	0	95-100	90-100	85-95	80-90	45-70	20-40
	36-72	Silty clay loam, silt loam, clay loam.	CL, CH, ML, SC	A-6, A-7, A-4	0	95-100	90-100	85-100	40-90	25-55	8-32
Sawyer	0-4	Silt loam	ML, CL-ML	A-4	0	100	95-100	85-95	60-90	<25	NP-7
	4-30	Silty clay loam, loam, silt loam.	CL	A-6, A-4	0	100	95-100	85-95	70-90	30-40	10-20
	30-80	Silty clay, clay	CH, CL, MH	A-7	0	100	95-100	90-100	80-90	45-60	20-35
20*: Sacul	0-8	Fine sandy loam	SM, ML	A-4	0	95-100	90-100	80-100	40-65	<20	NP-3
	8-36	Clay, silty clay	CH, MH, CL	A-7	0	95-100	90-100	85-95	80-90	45-70	20-40
	36-72	Silty clay loam, silt loam, clay loam.	CL, CH, ML, SC	A-6, A-7, A-4	0	95-100	90-100	85-100	40-90	25-55	8-32
Smithdale	0-16	Fine sandy loam	SM, SM-SC	A-4	0	100	85-100	60-80	36-49	<20	NP-5
	16-32	Clay loam, sandy clay loam, loam.	SM-SC, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-95	45-75	23-38	7-15
	32-80	Loam, sandy loam	SM, ML, CL, SC	A-4	0	100	85-100	65-80	36-70	<30	NP-10
21, 22: Savannah	0-9	Fine sandy loam	SM, ML	A-2-4, A-4	0	100	100	60-85	30-55	<25	NP-4
	9-27	Sandy clay loam, clay loam, loam.	CL, SC, CL-ML	A-4, A-6	0	100	100	80-100	40-80	23-40	7-19
	27-72	Loam, clay loam, sandy loam.	CL, SC, CL-ML	A-4, A-6, A-7	0	100	100	80-100	40-80	23-43	7-19

See footnote at end of table.

TABLE 15.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--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	
23, 24 Sawyer	0-4	Silt loam	ML, CL-ML	A-4	0	100	95-100	85-95	60-90	<25	NP-7
	4-30	Silty clay loam, loam, silt loam.	CL	A-6, A-4	0	100	95-100	85-95	70-90	30-40	10-20
	30-80	Silty clay, clay	CH, CL, MH	A-7	0	100	95-100	90-100	80-90	45-60	20-35
25, 26, 27*, 28* Smithdale	0-16	Fine sandy loam	SM, SM-SC	A-4	0	100	85-100	60-80	36-49	<20	NP-5
	16-32	Clay loam, sandy clay loam, loam.	SM-SC, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-95	45-75	23-38	7-15
	32-80	Loam, sandy loam	SM, ML, CL, SC	A-4	0	100	85-100	65-80	36-70	<30	NP-10
29*:											
Smithdale	0-16	Fine sandy loam	SM, SM-SC	A-4	0	100	85-100	60-80	36-49	<20	NP-5
	16-32	Clay loam, sandy clay loam, loam.	SM-SC, SC, CL, CL-ML	A-6, A-4	0	100	85-100	80-95	45-75	23-38	7-15
	32-80	Loam, sandy loam	SM, ML, CL, SC	A-4	0	100	85-100	65-80	36-70	<30	NP-10
Sacul	0-8	Fine sandy loam	SM, ML	A-4	0	95-100	90-100	80-100	40-65	<20	NP-3
	8-36	Clay, silty clay	CH, MH, CL	A-7	0	95-100	90-100	85-95	80-90	45-70	20-40
	36-72	Silty clay loam, silt loam, clay loam.	CL, CH, ML, SC	A-6, A-7, A-4	0	95-100	90-100	85-100	40-90	25-55	8-32
30 Smithton	0-12	Fine sandy loam	ML, SM	A-2, A-4	0	95-100	95-100	60-95	30-65	---	NP
	12-72	Fine sandy loam, loam.	ML, CL-ML	A-4	0	95-100	95-100	85-95	55-80	15-25	2-7
31*:											
Smithton	0-12	Fine sandy loam	ML, SM	A-2, A-4	0	95-100	95-100	60-95	30-65	---	NP
	12-72	Fine sandy loam, loam.	ML, CL-ML	A-4	0	95-100	95-100	85-95	55-80	15-25	2-7
Pheba	0-8	Silt loam	ML, CL, CL-ML	A-4	0	100	100	85-100	55-90	<25	NP-8
	8-29	Silt loam, loam	ML, CL, CL-ML	A-4	0	100	100	90-100	75-90	<25	NP-8
	29-72	Silt loam, loam, silty clay loam.	CL, ML	A-6, A-4	0	100	100	90-100	75-95	30-40	11-16
32. Udorthents											

* See map unit description for the composition and behavior of the map unit.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[The symbol < means less than; > means greater than. The erosion tolerance factor (T) is for the entire profile]

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
1---------------- Amy	0-20	0.6-2.0	0.13-0.24	4.5-5.5	Low------------	0.43	5
	20-40	0.06-0.2	0.16-0.24	4.5-5.5	Low------------	0.43	
	40-72	0.6-2.0	0.11-0.15	4.5-5.5	Low------------	0.43	
2---------------- Bonn	0-12	0.2-0.6	0.15-0.23	4.5-7.3	Low------------	0.49	3
	12-60	<0.06	0.08-0.14	5.6-9.0	Low------------	0.49	
	60-72	<0.2	0.08-0.14	6.6-9.0	Low------------	0.49	
3, 4------------- Briley	0-24	6.0-20	0.07-0.11	4.5-6.5	Low------------	0.20	5
	24-72	0.6-2.0	0.13-0.17	4.5-6.0	Low------------	0.24	
5*--------------- Guyton	0-19	0.6-2.0	0.20-0.23	4.5-6.0	Low------------	0.49	3
	19-72	0.06-0.2	0.15-0.22	4.5-5.5	Low------------	0.37	
6*--------------- Ouachita	0-19	0.6-2.0	0.15-0.24	4.5-6.0	Low------------	0.37	5
	19-68	0.2-0.6	0.15-0.24	4.5-5.5	Low------------	0.32	
	68-76	0.6-6.0	0.07-0.24	4.5-5.5	Low------------	0.24	
7---------------- Pheba	0-8	0.6-2.0	0.16-0.22	4.5-5.5	Low------------	0.49	3
	8-29	0.6-2.0	0.16-0.22	4.5-5.5	Low------------	0.49	
	29-72	0.2-0.6	0.05-0.10	4.5-5.5	Low------------	0.43	
8*:							
Pheba-----------	0-8	0.6-2.0	0.16-0.22	4.5-5.5	Low------------	0.49	3
	8-29	0.6-2.0	0.16-0.22	4.5-5.5	Low------------	0.49	
	29-72	0.2-0.6	0.05-0.10	4.5-5.5	Low------------	0.43	
Savannah--------	0-9	0.6-2.0	0.10-0.15	4.0-5.5	Low------------	0.24	3
	9-27	0.6-2.0	0.13-0.20	4.0-5.5	Low------------	0.28	
	27-72	0.2-0.6	0.05-0.10	4.0-5.5	Low------------	0.24	
9, 10, 11, 12*, 13*------------- Pikeville	0-15	0.6-2.0	0.10-0.15	4.5-5.5	Low------------	0.24	4
	15-28	0.6-2.0	0.10-0.15	4.5-5.5	Low------------	0.37	
	28-80	2.0-6.0	0.05-0.10	4.5-5.5	Low------------	0.10	
14--------------- Ruston	0-15	0.6-2.0	0.09-0.16	4.5-6.5	Low------------	0.32	5
	15-55	0.6-2.0	0.12-0.15	4.5-6.0	Low------------	0.32	
	55-80	0.6-2.0	0.12-0.17	4.5-6.0	Low------------	0.28	
15, 16, 17, 18*-- Sacul	0-8	0.6-2.0	0.10-0.20	4.5-5.5	Low------------	0.32	3
	8-36	0.06-0.2	0.12-0.18	4.5-5.5	High-----------	0.32	
	36-72	0.2-0.6	0.16-0.24	4.5-5.5	Moderate-------	0.37	
19*:							
Sacul-----------	0-8	0.6-2.0	0.10-0.20	4.5-5.5	Low------------	0.32	3
	8-36	0.06-0.2	0.12-0.18	4.5-5.5	High-----------	0.32	
	36-72	0.2-0.6	0.16-0.24	4.5-5.5	Moderate-------	0.37	
Sawyer----------	0-4	0.6-2.0	0.15-0.24	4.5-5.5	Low------------	0.43	3
	4-30	0.2-0.6	0.15-0.24	4.5-5.5	Moderate-------	0.37	
	30-80	0.06-0.2	0.12-0.18	4.5-5.5	High-----------	0.32	
20*:							
Sacul-----------	0-8	0.6-2.0	0.10-0.20	4.5-5.5	Low------------	0.32	3
	8-36	0.06-0.2	0.12-0.18	4.5-5.5	High-----------	0.32	
	36-72	0.2-0.6	0.16-0.24	4.5-5.5	Moderate-------	0.37	
Smithdale-------	0-16	2.0-6.0	0.14-0.16	4.5-5.5	Low------------	0.28	5
	16-32	0.6-2.0	0.15-0.17	4.5-5.5	Low------------	0.24	
	32-80	2.0-6.0	0.14-0.16	4.5-5.5	Low------------	0.28	

See footnote at end of table.

TABLE 16.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
21, 22----------- Savannah	0-9	0.6-2.0	0.10-0.15	4.0-5.5	Low------------	0.24	3
	9-27	0.6-2.0	0.13-0.20	4.0-5.5	Low------------	0.28	
	27-72	0.2-0.6	0.05-0.10	4.0-5.5	Low------------	0.24	
23, 24----------- Sawyer	0-4	0.6-2.0	0.15-0.24	4.5-5.5	Low------------	0.43	3
	4-30	0.2-0.6	0.15-0.24	4.5-5.5	Moderate--------	0.37	
	30-80	0.06-0.2	0.12-0.18	4.5-5.5	High-----------	0.32	
25, 26, 27*, 28*- Smithdale	0-16	2.0-6.0	0.14-0.16	4.5-5.5	Low------------	0.28	5
	16-32	0.6-2.0	0.15-0.17	4.5-5.5	Low------------	0.24	
	32-80	2.0-6.0	0.14-0.16	4.5-5.5	Low------------	0.28	
29*:							
Smithdale-------	0-16	2.0-6.0	0.14-0.16	4.5-5.5	Low------------	0.28	5
	16-32	0.6-2.0	0.15-0.17	4.5-5.5	Low------------	0.24	
	32-80	2.0-6.0	0.14-0.16	4.5-5.5	Low------------	0.28	
Sacul-----------	0-8	0.6-2.0	0.10-0.20	4.5-5.5	Low------------	0.32	3
	8-36	0.06-0.2	0.12-0.18	4.5-5.5	High-----------	0.32	
	36-72	0.2-0.6	0.16-0.24	4.5-5.5	Moderate--------	0.37	
30--------------- Smithton	0-12	0.6-2.0	0.10-0.2	4.5-5.5	Low------------	0.32	5
	12-72	0.2-0.6	0.11-0.2	4.5-5.5	Low------------	0.32	
31*:							
Smithton--------	0-12	0.6-2.0	0.10-0.2	4.5-5.5	Low------------	0.32	5
	12-72	0.2-0.6	0.11-0.2	4.5-5.5	Low------------	0.32	
Pheba-----------	0-8	0.6-2.0	0.16-0.22	4.5-5.5	Low------------	0.49	3
	8-29	0.6-2.0	0.16-0.22	4.5-5.5	Low------------	0.49	
	29-72	0.2-0.6	0.05-0.10	4.5-5.5	Low------------	0.43	
32. Udorthents							

* See map unit description for the composition and behavior of the map unit.

TABLE 17.--SOIL AND WATER FEATURES

[Absence of an entry indicates the feature is not a concern. See text for descriptions of symbols and such terms as "rare," "brief," and "perched." The symbol < means less than; > means greater than]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Uncoated steel	Concrete
					Ft				
1------------------ Amy	D	None---------	---	---	0-1.0	Perched	Dec-May	High-----	Moderate.
2------------------ Bonn	D	None---------	---	---	0-2.0	Perched	Dec-May	High-----	Low.
3, 4--------------- Briley	B	None---------	---	---	>6.0	---	---	Moderate	High.
5*----------------- Guyton	D	Frequent----	Long to very long.	Jan-June	0-1.5	Apparent	Dec-May	High-----	Moderate.
6*----------------- Ouachita	C	Frequent----	Long to very long.	Jan-June	>6.0	---	---	Moderate	Moderate.
7------------------ Pheba	C	None---------	---	---	1.5-2.0	Perched	Dec-May	High-----	High.
8*:									
Pheba------------	C	None---------	---	---	1.5-2.0	Perched	Dec-May	High-----	High.
Savannah---------	C	None---------	---	---	1.5-3.0	Perched	Dec-May	Moderate	High.
9, 10, 11, 12*, 13*-------------- Pikeville	B	None---------	---	---	>6.0	---	---	Low------	Moderate.
14----------------- Ruston	B	None---------	---	---	>6.0	---	---	Moderate	Moderate.
15, 16, 17, 18*--- Sacul	C	None---------	---	---	>6.0	---	---	High-----	Moderate.
19*:									
Sacul------------	C	None---------	---	---	>6.0	---	---	High-----	Moderate.
Sawyer-----------	C	None---------	---	---	2.0-3.0	Perched	Dec-May	High-----	High.
20*:									
Sacul------------	C	None---------	---	---	>6.0	---	---	High-----	Moderate.
Smithdale--------	B	None---------	---	---	>6.0	---	---	Low------	Moderate.
21, 22------------ Savannah	C	None---------	---	---	1.5-3.0	Perched	Dec-May	Moderate	High.
23, 24------------ Sawyer	C	None---------	---	---	2.0-3.0	Perched	Dec-May	High-----	High.
25, 26, 27*, 28*-- Smithdale	B	None---------	---	---	>6.0	---	---	Low------	Moderate.
29*:									
Smithdale--------	B	None---------	---	---	>6.0	---	---	Low------	Moderate.
Sacul------------	C	None---------	---	---	>6.0	---	---	High-----	Moderate.
30----------------- Smithton	D	None---------	---	---	0-1.0	Perched	Dec-May	High-----	High.

See footnote at end of table.

TABLE 17.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Uncoated steel	Concrete
					Ft				
31*:									
Smithton----------	D	None---------	---	---	0-1.0	Perched	Dec-May	High-----	High.
Pheba------------	C	None---------	---	---	1.5-2.0	Perched	Dec-May	High-----	High.
32. Udorthents									

* See map unit description for the composition and behavior of the map unit.

TABLE 18.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Amy------------------------	Fine-silty, siliceous, thermic Typic Ochraquults
Bonn-----------------------	Fine-silty, mixed, thermic Glossic Natraqualfs
Briley---------------------	Loamy, siliceous, thermic Arenic Paleudults
Guyton---------------------	Fine-silty, siliceous, thermic Typic Glossaqualfs
Ouachita-------------------	Fine-silty, siliceous, thermic Fluventic Dystrochrepts
Pheba----------------------	Coarse-silty, siliceous, thermic Glossaquic Fragiudults
Pikeville------------------	Fine-loamy, siliceous, thermic Typic Paleudults
Ruston---------------------	Fine-loamy, siliceous, thermic Typic Paleudults
Sacul----------------------	Clayey, mixed, thermic Aquic Hapludults
Savannah-------------------	Fine-loamy, siliceous, thermic Typic Fragiudults
Sawyer---------------------	Fine-silty, siliceous, thermic Aquic Paleudults
Smithdale------------------	Fine-loamy, siliceous, thermic Typic Paleudults
Smithton-------------------	Coarse-loamy, siliceous, thermic Typic Paleaquults

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