SOIL SURVEY OF

Ouachita Parish, Louisiana

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

Issued February 1974

Major fieldwork for this soil survey was done in the period 1964–68. Soil names and descriptions were approved in 1968. Unless otherwise indicated, statements in the publication refer to conditions in the parish in 1968. This survey was made cooperatively by the Soil Conservation Service and the Louisiana Agricultural Experiment Station. It is part of the technical assistance furnished to the D'Arbonne and Boeuf River Soil and Water Conservation Districts.

Either enlarged or reduced copies of the soil map in this publication can be made by commercial photographers, or they can be purchased on individual order from the Cartographic Division, Soil Conservation Service, United States Department of Agriculture, Washington, D.C. 20250

HOW TO USE THIS SOIL SURVEY

THIS SURVEY contains information that can be applied in managing farms, ranches, and woodlands; in selecting sites for roads, ponds, buildings, and other structures; and in judging the suitability of tracts of land for agriculture, industry, and recreation.

Locating Soils

All the soils of Ouachita Parish are shown on the detailed map at the back of this publication. This map consists of many sheets made from aerial photographs. Each sheet is numbered to correspond with a number on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbols. All areas marked with the same symbol are the same kind of soil. The symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information. This guide lists all the soils of the parish in alphabetic order by map symbol and gives the capability classification of each. It also shows the page where each soil and each capability unit is described and the woodland group in which the soil has been placed.

Individual colored maps showing the relative suitability or degree of limitation of soils for many specific purposes can be developed by using the soil map and the information in the text. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils from the soil descriptions and from the discussions of the capability groups.

Foresters and others can refer to the section "Use of the Soils for Woodland," where the soils of the parish are grouped according to their suitability for trees.

Game managers, sportsmen, and others can find information about soils and wildlife in the section "Wildlife."

Engineers and builders can find, under "Use of the Soils in Engineering," tables that contain test data, estimates of soil properties, and information about soil features that affect engineering practices.

Scientists and others can read about how the soils formed and how they are classified in the section "Formation and Classification of the Soils."

Newcomers in Ouachita Parish may be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the section "General Nature of the Parish."

Cover picture: **Bayou DeSiard, a former channel of the Arkansas River, important in the development of the Monroe area. Sterlington silt loam, 0 to 1 percent slopes, and Rilla silt loam, 0 to 1 percent slopes, are well suited to farm crops and have only slight limitations for homesites. The bayou, which now has several dams, is the water supply for the city of Monroe. The various lakes provide opportunities for water sports, fishing, picnicking, and other kinds of recreation.**

U.S. GOVERNMENT PRINTING OFFICE: 1974

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402

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UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, IN COOPERATION WITH THE LOUISIANA AGRICULTURAL EXPERIMENT STATION

OUACHITA PARISH is along the east and west banks of the Ouachita River in the northeastern part of Louisiana (fig. 1).

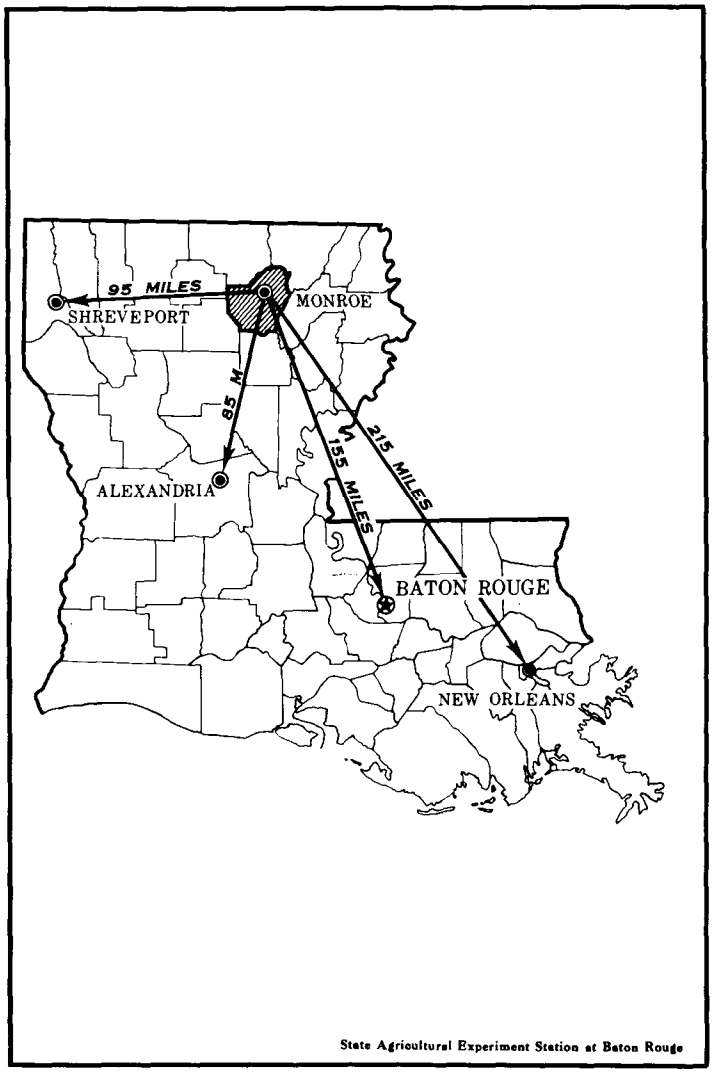

Figure 1.—Location of Ouachita Parish in Louisiana.

The total area of the parish is 411,520 acres. In 1966 the population totaled 101,663.

This parish consists of mainly level and nearly level soils on bottom land, nearly level to gently sloping soils on terraces, and undulating to steep soils on uplands of the Coastal Plain.

The bottom land consists of level and nearly level loamy soils on natural levees and clayey (buckshot) soils on broad flats. The loamy soils have been cleared for many years and used intensively for cotton, soybeans, and corn. They generally are moderately low in natural fertility, but crops on these soils respond very well to fertilizer. No significant acreage of the clayey soils was cleared until recently. Now, large acreages are being cleared rapidly, mainly for growing soybeans. These clayey soils are moderate in natural fertility. Response to fertilizer is fair. Drainage is required for cultivated crops and pasture. Some areas are subject to flooding.

The nearly level to gently sloping soils on terraces are at a higher elevation and are adjacent to the river bottom lands. They have a high silt content and are moderately low in natural fertility. Response to fertilizer is fair to good if the soils are used for crops. Most of the acreage is woodland.

The undulating to steep soils on uplands of the Coastal Plain occupy the western one-third of the parish. They are at the highest elevations of the parish. The soils in this area are higher in sand content than the soils on terraces. They are low in natural fertility. Response to fertilizer is fair to good if the soils are used for crops. Erosion is a severe hazard on the steeper, clean tilled soils. A large acreage was once cleared and planted mainly to cotton, but during the past 20 years most of this acreage has reverted to pine trees.

Industrial, commercial, and residential sites now occupy a significant acreage.

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soil are in Ouachita Parish, where they are located, and how they can be used. The soil scientists went into the parish knowing they likely would find many soils they had already seen and perhaps some they had not. They observed the steepness, length, and shape of slopes, the

size and speed of streams, the kinds of native plants or crops, 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 that has not been changed much by leaching or by the action of plant roots.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in parishes nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. The *soil series* and the *soil phase* are the categories of soil classification most used in a local survey (*9*).[1]

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Perry and Rilla, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in those characteristics that affect their behavior in the undisturbed landscape.

Soils of one series can differ in texture of the surface soil and in slope, stoniness, or some other characteristic that affects use of the soils by man. On the basis of such differences, a soil series is divided into phases. The name of a soil phase indicates a feature that affects management. For example, Portland silt loam is one of the two phases within the Portland series.

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

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning the management of farms and fields, a mapping unit is nearly equivalent to a soil phase. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil phase.

Some mapping units are made up of soils of different series, or of different phases within one series. Two such kinds of mapping units are shown on the soil map of Ouachita Parish: soil complexes and soil associations.

A soil complex consists of areas of two or more soils, so intermingled or so small in size that they cannot be shown separately on the soil map. Each area of a complex contains some of each of the two or more dominant soils, and the pattern and relative proportions are about the same in all areas. The name of a soil complex consists of the names of the dominant soils, joined by a hyphen. Rilla-Hebert complex, gently undulating, is an example.

A soil association is made up of adjacent soils that occur as areas large enough to be shown individually on the soil map but are shown as one unit because the time and effort of delineating them separately cannot be justified. There is a considerable degree of uniformity in pattern and relative extent of the dominant soils, but the soils may differ greatly one from another. The name of an association consists of the names of the dominant soils, joined by a hyphen. Ruston-Lucy association, hilly, is an example.

In most areas surveyed there are places where the soil material is so severely eroded that it cannot be classified by soil series. These places are shown on the soil map and are described in the survey, but they are called land types and are given descriptive names. Terrace escarpments is a land type in Ouachita Parish.

While a soil survey is in progress, samples of soils are taken, as needed, for laboratory measurements and for engineering tests. Laboratory data from the same kinds of soil in other places are assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soils. Yields under defined management are estimated for the soils.

But only part of a soil survey is done when the soils have been named, described, and delineated on the map, and the laboratory data and yield data have been assembled. The mass of detailed information then needs to be organized in such a way as to be readily useful to different groups of users, among them farmers, managers of woodland and rangeland, and engineers.

On the basis of yield and practice tables and other data, the soil scientists set up trial groups. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others, then adjust the groups according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under present methods of use and management.

General Soil Map

The general soil map at the back of this survey shows, in color, the soil associations in Ouachita Parish. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in the parish, who want to compare different parts of the parish, or who want to know the location of large tracts that are suitable for a certain kind of land use. Such a map is a useful general guide in managing a watershed, a wooded tract, or a wildlife area, or in planning engineering works, recreational facilities, and community developments. It is not a suitable map for planning the management of a farm or field, or for selecting the exact location of a road, building, or similar structure, because the soils in any one association ordinarily differ in slope, depth, stoniness, drainage, and other characteristics that affect their management.

The 14 soil associations in Ouachita Parish are described on the following pages.

[1] Italic numbers in parentheses refer to Literature Cited, p. 78.

Mainly Level and Nearly Level Soils on Bottom Land

The soils on bottom land are young to old. They make up about 47 percent of the parish. They consist of loamy and clayey sediments that were deposited largely by the Arkansas River before it shifted its course. In the western part of the parish the bottom-land soils consist of loamy sediments from the Coastal Plain and are dominantly unprotected from flooding. Elevations range from 50 to about 100 feet above sea level.

1. Hebert-Sterlington-Rilla association

Level to nearly level, loamy soils on natural levees

This association consists of acid, level or nearly level, loamy soils on natural levees on the Ouachita River bottom land. Elevations are dominantly 65 to 85 feet above sea level.

This association makes up about 16 percent of the parish. It is about 43 percent Hebert soils, 22 percent Sterlington soils, and 22 percent Rilla soils. The remaining 13 percent consists of several minor soils.

Hebert soils occupy the lowest elevations on the landscape. They have a surface layer of dark grayish-brown silt loam and a subsoil of reddish-brown silty clay loam mottled with gray. They are somewhat poorly drained, moderately slowly permeable, and medium acid to very strongly acid.

Sterlington soils occupy the highest elevations on the landscape, near the streams or bayous. They have a surface layer of dark grayish-brown silt loam and a subsoil of reddish-brown to yellowish-red silt loam. They are well drained, moderately permeable, and slightly acid to very strongly acid.

Rilla soils occupy intermediate elevations on the landscape. They have a surface layer of brown silt loam and a subsoil of reddish-brown silty clay loam. They are well drained, moderately slowly permeable, and medium acid to very strongly acid.

Practically all the association is used for cultivated crops. A small acreage is in pasture and mixed hardwoods. Most of the land is owned by individuals. Companies own a few large tracts. Farms are dominantly 200 to 500 acres in size. Cotton, corn, and soybeans are the principal crops.

This association is well suited to most cultivated crops and pasture plants grown in the area. The main concern on all the soils is maintaining good tilth. Wetness is an additional concern on the Hebert soils.

2. Perry-Portland association

Level soils that have a clayey subsoil and are on broad flats

This association is an area of level soils that have a clayey subsoil. It is mainly on broad flats of the bottom land in the eastern half of the parish. A small area is on the western side of the Ouachita River. Elevations are dominantly 55 to 65 feet above sea level. Most of the association is subject to occasional flooding.

This association makes up about 18 percent of the parish. It is about 71 percent Perry soils and 29 percent Portland soils.

Perry soils occupy the lowest elevations on the landscape. They have a dark-gray clay surface layer and a gray clay subsoil mottled with brown. The underlying layers are gray or reddish-brown clay. These soils are poorly drained and very slowly permeable. They are slightly acid to very strongly acid in the upper part and are alkaline below a depth of 40 inches.

Portland soils are on low convex ridges or in nearly level areas. They have a dark grayish-brown loamy or clayey surface layer about 6 inches thick and a reddish-brown clay subsoil. They are somewhat poorly drained and are very slowly permeable. Portland soils are medium acid to very strongly acid in the upper part and range to alkaline within a depth of 40 inches.

About 70 percent of the association is in mixed hardwood forest, and about 20 percent is used for cultivated crops and pasture. Most of the woodland is owned by companies. The State-owned Russell Sage Wildlife Management Area covers 13,875 acres of woodland. Privately owned farms are about 500 to 1,000 acres in size. Soybeans is the principal crop. Each year additional woodland is cleared, primarily for cultivation of soybeans and rice.

If drainage and flood control are adequate, this association is fairly well suited to most cultivated crops and pasture plants grown in the area. The main limitations to cultivation are wetness, poor tilth, and difficult tillage. The soils become cloddy when worked. They crack when dry, and the cracks seal when the soils are wet. Many areas are subject to flooding, mostly in winter and spring. Small areas are flooded frequently by 1 to 5 feet of water.

3. Alligator-Leaf association

Level soils that have a clayey subsoil and are subject to frequent flooding

This association consists of acid, level soils that have a clayey subsoil. It is on flood plains and low terraces in the north-central part of the parish and is subject to frequent flooding. Elevations are dominantly 50 to 75 feet above sea level.

This association makes up about 2 percent of the parish. It is about 54 percent Alligator soils, 23 percent Leaf soils, and 10 percent Perry soils. The remaining 13 percent is dominantly Portland and Hebert soils.

Alligator soils occupy intermediate and low positions on the landscape. They have a surface layer of gray or grayish-brown clay and a subsoil of gray clay that has brownish mottles. These soils are poorly drained and very slowly permeable. They are strongly acid to very strongly acid in the upper part and range to moderately alkaline below a depth of 40 inches.

Leaf soils occupy the highest elevations in the landscape but are subject to flooding. They have a surface layer of dark-brown or gray silt loam about 6 inches thick and a gray, clayey subsoil mottled with brown. They are poorly drained, very slowly permeable, and strongly acid to very strongly acid.

Perry soils occupy the low and intermediate elevations on the landscape. They have a surface layer of dark-gray clay and a subsoil of gray clay mottled with brown. The underlying layers are reddish-brown or gray clay. These soils are poorly drained and very slowly permeable. They are slightly acid to very strongly acid in the upper part and are alkaline within a depth of 40 inches.

Most of the association is in mixed hardwood forest. Most of the acreage is owned by companies and is used

for the production of wood crops. A few individually owned tracts of pine forest are on the Leaf soils. They are about 80 to 200 acres in size.

This association is poorly suited to cultivated crops and pasture, mainly because flooding is a hazard. The Alligator and Perry soils are subject to frequent deep flooding. The Leaf soils are subject to frequent but shallower flooding. Flooding, wetness, and difficult tillage are major limitations.

4. Guyton-Rosebloom association

Level, loamy soils that are subject to frequent flooding

This association consists of acid, level, loamy soils. It is on bottom land in the western half of the parish and is subject to flooding. Elevations are dominantly 80 to 100 feet above sea level.

This association makes up 9 percent of the parish. It is about 40 percent Guyton soils and 25 percent Rosebloom soils. Waller, Frizzell, and Savannah soils make up the remaining 35 percent.

Guyton soils are on the level or slightly convex parts of the landscape. Rosebloom soils are in depressions. Both soils have a surface layer of grayish-brown or gray silt loam and a subsoil of gray silt loam or silty clay loam mottled with brown. Both are medium acid to very strongly acid and poorly drained. Guyton soils are very slowly permeable, and Rosebloom soils are slowly permeable.

About 85 percent of the association is in pine and mixed hardwood forest. The rest is in unimproved pasture. Nearly half the association is owned by paper companies. The rest is owned by individuals.

Frequent flooding makes this association unsuited to most locally grown cultivated crops. The soils are fairly well suited to pasture and hay crops. Wetness and flooding are major limitations.

5. Barclay-Rosebloom association

Gently undulating, loamy soils that are adjacent to the Ouachita River and are subject to occasional flooding

This association consists of loamy soils in a ridge and swale pattern on the river side of the Ouachita River levee system. It is subject to flooding. Elevations are 60 to 75 feet above sea level.

This association makes up about 2 percent of the parish. It is about 63 percent Barclay soils and 24 percent Rosebloom soils. Minor soils make up the remaining 13 percent.

Barclay soils occupy the highest elevations in the association. They have a surface layer of dark grayish-brown silt loam and a subsoil of brown or gray silt loam or very fine sandy loam mottled with brown and gray. They are somewhat poorly drained, moderately permeable, and strongly acid to very strongly acid.

Rosebloom soils occupy the swales. They have a surface layer of grayish-brown or gray silt loam and a subsoil of gray silt loam or silty clay loam mottled with brown. They are poorly drained, slowly permeable, and medium acid to very strongly acid.

About 90 percent of the association is in mixed hardwood forest, and 10 percent is used for pasture. Most of the land is privately owned.

Most parts of this association are subject to rapidly moving floodwater in winter and spring and are poorly suited to cultivated crops. Improved pasture and hay crops can be grown where the flood hazard is not too severe. The uneven land surface and wetness in the swales are additional hazards.

Level to Gently Sloping Soils on Terraces

Nearly level to gently sloping soils on terraces occupy about 18 percent of the parish. They are on each side of the Ouachita River, along the margins of the Arkansas River flood plain. Most areas are protected from flooding. Elevations are dominantly 80 to 100 feet above sea level but range from 60 to 150 feet.

6. Frizzell-Providence-Guyton association

Level to gently sloping, loamy soils

This association consists of acid, loamy soils that developed from silty material. The soils are dominantly level but are gently sloping near the drainageways. Most of this association is in the northeastern part of the parish. Smaller areas are west of the Ouachita River and are parallel to it. Elevations range from 95 to 150 feet.

This association makes up about 13 percent of the parish. It is about 39 percent Frizzell soils, 18 percent Providence soils, and 7 percent Guyton soils. Poorly drained minor soils make up the remaining 36 percent.

Frizzell soils occupy the highest elevations in the association. They have a surface layer of brown silt loam mottled with gray. The subsoil is gray and yellowish-brown silt loam or silty clay loam mottled with brown. These soils are somewhat poorly drained, slowly permeable, and medium acid to very strongly acid.

Providence soils are in the lower areas bordering natural drains, or they occupy the ridgetops of undulating areas. They have a surface layer of dark grayish-brown to yellowish-brown silt loam and a subsoil of yellowish-brown to yellowish-red silt loam or silty clay loam mottled with brown and red. These soils have a slowly permeable fragipan at a depth of 15 to 35 inches. They are moderately well drained, slowly permeable, and strongly to very strongly acid.

Guyton soils occupy depressional areas at intermediate elevations in the association. They have a surface layer of gray or grayish-brown silt loam and a subsoil of gray silt loam or silty clay loam mottled with brown. They are poorly drained, very slowly permeable, and medium acid to very strongly acid.

About 85 percent of the association is in pine and mixed hardwood forest. Most of the woodland is owned by companies. Timber production is the major enterprise. About 15 percent of the association is owned by individuals and is used for pasture and homesites. Farms are about 20 to 200 acres in size. West of the Ouachita River, the land is gradually being used for rural and suburban homesites.

This association is fairly well suited to most locally grown cultivated crops and pasture grasses. Low fertility is a limitation in all the soils in the association. Wetness is a major limitation of the Frizzell and Guyton soils. Some areas of Guyton soils are flooded in winter.

7. Wrightsville-Alligator-Crowley association

Level soils that have a clayey subsoil

This association consists of acid, level soils that have a clayey subsoil. It is on flats at the center of the southeast quarter of the parish. Elevations are dominantly 65 to 75 feet above sea level.

This association makes up about 3 percent of the parish. It is 33 percent Wrightsville soils, 20 percent Alligator soils, and 19 percent Crowley soils. Cadeville, Muskogee, and other minor soils make up the remaining 28 percent of the association. They range from gently sloping to steep.

Wrightsville soils occupy intermediate elevations on the landscape. They have a surface layer of grayish-brown silt loam and a subsoil of light brownish-gray clay mottled with brown. They are poorly drained, very slowly permeable, and strongly to very strongly acid.

Alligator soils occupy the lower elevations. They have a surface layer of gray or grayish-brown clay and a subsoil of gray clay mottled with brown. These soils are poorly drained and are very slowly permeable. They are strongly acid to very strongly acid in the upper part and range to moderately alkaline at a depth below 40 inches.

Crowley soils are on convex ridges at the highest elevations. They have a surface layer of dark grayish-brown silt loam and a subsoil of grayish-brown clay mottled with brown and red. They are poorly drained to somewhat poorly drained and are very slowly permeable. Crowley soils are slightly acid to very strongly acid in the upper part and range to neutral at a depth below 30 inches.

About 70 percent of the association is in mixed hardwood forest and scattered stands of southern pine. About 30 percent is used for cultivated crops, pasture, and residential developments. Practically all the land is owned by individuals. Individual tracts are dominantly 10 to 80 acres in size. Soybeans and cattle are the principal crops.

This association is poorly suited to most commonly cultivated crops and pasture plants. The main limitations are severe wetness, very slow permeability, low natural fertility, and poor tilth.

8. Waller-Guyton association

Level, loamy soils on broad flats and in depressions

This association consists of acid, level, loamy soils on broad flats and in depressions on the west side of the Ouachita River, in the center of the parish. Elevations are 80 to 100 feet above sea level.

This association makes up about 2 percent of the parish. It is about 73 percent Waller soils, 18 percent Guyton soils, and 9 percent minor soils.

Waller soils are level or depressional. They have a surface layer of yellowish-brown loam and a subsoil of gray clay loam mottled with brown. They are poorly drained, very slowly permeable, and medium acid to very strongly acid.

Guyton soils occupy the higher elevations on the broad flats. They have a surface layer of gray or grayish-brown silt loam and a subsoil of gray silty clay loam mottled with brown. They are poorly drained, very slowly permeable, and medium acid to very strongly acid.

About 60 percent of the association is in pine and mixed hardwood forest. About 20 percent is used for pasture, and 20 percent for residential and industrial sites. Nearly all of the land is individually owned. Farms are about 80 acres in size. A small acreage is cleared yearly for pasture and homesites.

This association is poorly suited to most of the locally grown cultivated crops and is fairly well suited to most locally adapted pasture plants. The main limitations to cultivation are wetness and low natural fertility. Some areas are subject to shallow flooding in winter and spring.

Undulating to Steep Soils on Uplands of the Coastal Plain

The uplands of the Coastal Plain occupy 35 percent of the parish. They are dissected by numerous natural drainageways. Elevations dominantly range from 200 to 300 feet. Relief is locally more than 50 feet within an area of 5 square miles. At the higher elevations the soils are loamy and sandy. At the lower elevations adjacent to deep natural drains, varying textures occur and the soils are loamy, sandy, and clayey.

9. Kirvin-Ruston association

Strongly sloping soils that have a loamy to clayey subsoil

This association consists of well-drained, acid, strongly sloping soils that have a loamy to clayey subsoil. It is on the tops and sides of narrow ridges in the northwestern part of the parish, where it borders the flood plains of Bayou D'Arbonne and Bayou Choudrant. Elevations are dominantly 100 to 150 feet above sea level.

This association makes up about 2 percent of the parish. It is 42 percent Kirvin soils and 36 percent Ruston soils. Ora and Cadeville soils make up the remaining 22 percent.

Kirvin soils are steep and are on the sides of ridges. They have a surface layer of dark yellowish-brown fine sandy loam and a subsoil of red sandy clay. They are well drained, moderately slowly permeable, and medium acid to very strongly acid.

Ruston soils occupy the crests of the ridges at the highest elevations. They have a surface layer of brown fine sandy loam and a subsoil of yellowish-red to red sandy clay loam. They are well drained, moderately permeable, and medium acid to very strongly acid.

Practically all of the association is in pine and mixed hardwood forest. A small acreage on the ridgetops along major highways is cleared for homesites and pasture. Most land is individually owned, in tracts of 40 to 200 acres. About 25 percent of the association was cultivated, but it has been planted to pine.

The soils on the smooth ridgetops are suited to cultivated crops and pasture. The steep Kirvin soils are best suited to pines. The erosion hazard and low fertility are the major limitations to cultivation.

10. Cadeville-Ora association

Strongly sloping to steep soils that have a clayey or loamy subsoil

This association consists of acid soils that have a loamy to dominantly clayey subsoil. It is on the tops and sides

of narrow ridges in the southwestern part of the parish. Elevations are 140 to 200 feet above sea level.

This association makes up about 5 percent of the parish. It is about 43 percent Cadeville soils, 15 percent Ora soils, and 7 percent Kirvin soils. The remaining 35 percent is Ruston and Savannah soils on the ridgetops and Guyton and Rosebloom soils in the drainageways.

Cadeville soils occupy the middle and upper parts of slopes. They have a surface layer of brown fine sandy loam and a subsoil of yellowish-red silty clay mottled with grayish brown. The underlying layers are grayish silty clay. These soils are moderately well drained, very slowly permeable, and medium acid to very strongly acid.

Ora soils are on the middle and lower parts of slopes. They have a surface layer of yellowish-brown fine sandy loam and a subsoil of yellowish-red to strong-brown loam or sandy clay loam. Below this is a fragipan. These soils are moderately well drained, moderately permeable, and medium acid to very strongly acid.

The steep Kirvin soils are on the upper parts of slopes and on short slopes near drainageways. They have a surface layer of dark yellowish-brown fine sandy loam and a subsoil of red sandy clay. They are well drained, moderately slowly permeable, and medium acid to very strongly acid.

About 90 percent of the association is in pine and mixed hardwood forest. Small areas are used for pasture. Most of the land is owned by companies and is used for growing trees. Individually owned farms are dominantly less than 100 acres in size.

This association is generally poorly suited to cultivated crops and pasture. The small areas of Ora and Kirvin soils that have slopes of less than 8 percent are suited to pasture and cultivated crops. The major limitations to cultivation are the thin surface layer, the clayey subsoil that restricts the growth of roots, and the steep slopes of the Cadeville soils. The wet soils along the small drainageways are well suited to pasture.

11. Ruston-Lucy-Alaga association

Steep soils that are loamy or sandy below the surface layer

This association consists of acid, well-drained soils on the tops and sides of narrow ridges in the western third of the parish. Elevations are 100 to 250 feet above sea level.

This association makes up about 14 percent of the parish. It is about 30 percent Ruston soils, 20 percent Lucy soils, and 17 percent Alaga soils. The remaining 33 percent is made up of the sloping Kirvin soils and wet variable soil material along small drainageways.

Ruston soils occupy the upper slopes and the narrow, smooth ridgetops. They have a surface layer of brown fine sandy loam and a subsoil of red or yellowish-red sandy clay loam. They are well drained, moderately permeable, and medium acid to very strongly acid.

Lucy soils occupy the middle and lower slopes. They have a thick surface layer of yellowish-brown loamy fine sand and a subsoil of red sandy loam. They are well drained, moderately permeable, and medium acid to very strongly acid.

Alaga soils occupy the lower slopes. They have a surface layer of yellowish-brown loamy fine sand and a subsoil of brown to yellowish-red loamy fine sand. They are excessively drained, rapidly permeable, and strongly acid.

More than 80 percent of the association is in pine and mixed hardwood forest. The rest is used for pasture and homesites. Most of the woodland is owned by companies. Individually owned farms are dominantly 80 to 200 acres in size.

The gently sloping soils on ridgetops are suited to cultivated crops and pasture. The steep soils are fairly well suited to pasture but are not suited to cultivated crops. Erosion and droughtiness are major limitations to cultivation. The wet soils in drainageways are well suited to pasture.

12. Ruston-Lucy association

Undulating to moderately sloping soils that have a loamy subsoil

This association consists of acid, well-drained soils on the tops and sides of ridges in the northwest quarter of the parish. Elevations are about 150 to 250 feet above sea level.

This association makes up about 9 percent of the parish. It is about 54 percent Ruston soils and 8 percent Lucy soils. The remaining 38 percent is Savannah soils on the ridgetops and wet variable soil materials in the small drainageways.

Ruston soils occupy the ridgetops and upper part of side slopes. They have a surface layer of brown fine sandy loam and a subsoil of red or yellowish-red sandy clay loam. They are well drained, moderately permeable, and medium acid to very strongly acid.

Lucy soils occupy the middle and lower parts of slopes. They have a surface layer of thick yellowish-brown loamy fine sand and a subsoil of red or yellowish-red sandy loam. They are well drained, moderately permeable, and medium acid to very strongly acid.

About 65 percent of the association is in pine and mixed hardwood forest. About 30 percent is used for pasture and truck crops and for homesites. About 70 percent of the land is individually owned. Tracts are mostly 40 acres or less in size. A moderate acreage is cleared each year for pasture and homesites.

The gently sloping soils are well suited to cultivated crops and pasture. The steep soils are fairly well suited to pasture and are well suited to pine trees. The main limitations to cultivation are low fertility and erosion. The wet soils along the drainageways are suited to pasture.

13. Alaga-Lucy Association

Moderately sloping soils that are sandy or loamy below the surface layer

This association consists of acid soils that have a sandy and loamy subsoil. It is on the long, smooth sides and wide, smooth tops of ridges in the extreme western part of the parish. Elevations are dominantly 200 to 300 feet above sea level, the highest elevations in the parish.

This association makes up less than 1 percent of the parish. It is 65 percent Alaga soils, 15 percent Lucy soils, and 20 percent minor soils.

Alaga soils occupy the highest elevations in the association. They have a surface layer of yellowish-brown loamy fine sand and a subsoil of yellowish-brown to

yellowish-red loamy fine sand. They are excessively drained, rapidly permeable, and medium acid to very strongly acid.

Lucy soils occupy the lower and intermediate slopes. They have a thick surface layer of yellowish-brown loamy fine sand and a subsoil of yellowish-red or red sandy loam. They are well drained, moderately permeable, and medium acid to very strongly acid.

About 60 percent of the association is used for truck crops and other cultivated crops. About 40 percent is in second-growth pine and mixed hardwood forest. All of the land is privately owned. Farms are about 100 acres in size. Watermelons and field peas are the major crops.

This association is well suited to pine trees. It is not so well suited to many of the locally grown cultivated crops and pasture plants. It is fairly well suited to cool season crops and some truck crops. Droughtiness and the traction problem in use of equipment are major limitations to cultivation.

14. Ora-Savannah association

Nearly level to strongly sloping, loamy soils that have a fragipan

This association consists of acid, nearly level to strongly sloping, loamy soils on low undulating hills dissected by small drainageways. It is well distributed over the western half of the parish. Elevations are dominantly 100 to 200 feet above sea level.

This association makes up about 4 percent of the parish. It is about 48 percent Ora soils, 12 percent Savannah soils, 12 percent Providence soils, and 28 percent minor soils, dominantly Cadeville and Ruston soils.

Ora soils occupy the short slopes near the deeper drainageways. They have a surface layer of yellowish-brown fine sandy loam and a subsoil of yellowish-red sandy clay loam. The underlying fragipan layers are brown and yellowish-red, brittle sandy clay loam. These soils are moderately well drained, moderately permeable, and medium acid to very strongly acid.

Savannah soils occupy the crests and gently sloping sides of low ridges. They have a surface layer of dark-brown fine sandy loam and a subsoil of strong-brown loam or sandy clay loam. A gray and brown mottled fragipan is below a depth of 25 inches. These soils are moderately well drained, slowly permeable, and medium acid to very strongly acid.

Providence soils occupy the highest elevations on the tops and sides of ridges. They have a surface layer of dark grayish-brown to yellowish-brown silt loam and a subsoil of yellowish-brown to yellowish-red silt loam. A brown and gray mottled fragipan is below a depth of 20 inches. These soils are moderately well drained, slowly permeable, and strongly acid to very strongly acid.

About 70 percent of the association is in pine and mixed hardwood forest. About 20 percent is estate-type developments consisting of homes, small pastures, gardens, and woodlands. The average size of these estates is about 20 acres. About 60 percent of the association is owned by companies and used for the production of wood crops.

This association is suited to most cultivated crops and pasture plants commonly grown in the area. The main limitations to cultivation are erosion and low natural fertility.

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Descriptions of the Soils

This section describes the soil series and mapping units in Ouachita Parish. Each soil series is described in considerable detail, and then, briefly, each mapping unit in that series. Unless it is specifically mentioned otherwise, it is to be assumed that what is stated about the soil series holds true for the mapping units in that series. Thus, to get full information about any one mapping unit, it is necessary to read both the description of the mapping unit and the description of the soil series to which it belongs.

An important part of the description of each soil series is the soil profile, that is, the sequence of layers from the surface downward to rock or other underlying material. Each series contains two descriptions of this profile. The first is brief and in terms familiar to the layman. The second, detailed and in technical terms, is for scientists, engineers, and others who need to make thorough and precise studies of soils. Unless it is otherwise stated, the colors and consistence given in the descriptions are those of a moist soil.

As mentioned in the section "How This Survey Was Made," not all mapping units are members of a soil series. Made land and Terrace escarpments, for example, do not belong to a soil series, but nevertheless are listed in alphabetic order along with the soil series.

Following the name of each mapping unit is a symbol in parentheses. This symbol identifies the mapping unit on the detailed soil map. Listed at the end of each description of a mapping unit is the capability unit and woodland group in which the mapping unit has been placed. The page for the description of each capability unit can be found by referring to the "Guide to Mapping Units" at the back of this survey.

The acreage and proportionate extent of each mapping unit are shown in table 1. Many of the terms used in describing soils can be found in the Glossary at the end of this survey, and more detailed information about the terminology and methods of soil mapping can be obtained from the Soil Survey Manual (*9*).

Alaga Series

Soils of the Alaga series are sandy, excessively drained, and droughty. They are on broad, rolling ridges in the extreme western part of the parish.

In a representative profile the upper 32 inches is mainly yellowish-brown loamy fine sand. Below this is strong-brown and light yellowish-brown loamy fine sand.

Representative profile of an Alaga loamy fine sand in a wooded area one-half mile west of the Calhoun Lookout Tower, in northeast part of sec. 6, T. 17 N., R. 1 E.:

A1—0 to 2 inches, dark grayish-brown (10YR 4/2) and grayish-brown (10YR 5/2) loamy fine sand; weak, fine, granular structure; very friable; few pieces of charcoal; very strongly acid; clear, smooth boundary.

C1—2 to 5 inches, yellowish-brown (10YR 5/4) loamy fine sand; single grain; very friable; few, white, uncoated sand grains; few pieces of charcoal; strongly acid; gradual, smooth boundary.

C2—5 to 21 inches, yellowish-brown (10YR 5/4) loamy fine sand; single grain; very friable; 10 percent light-gray, uncoated sand grains; strongly acid; clear, wavy boundary.

TABLE 1.—*Approximate acreage and proportionate extent of the soils*

Soil	Area	Extent	Soil	Area	Extent
	Acres	*Percent*		*Acres*	*Percent*
Alaga-Lucy association, undulating	792	0. 2	Ora-Savannah association, gently rolling	14, 344	3. 5
Alligator clay	2, 427	. 6	Perry clay, frequently flooded	9, 340	2. 3
Alligator clay, frequently flooded	5, 352	1. 3	Perry clay, occasionally flooded	52, 066	12. 7
Barclay-Rosebloom complex, occasionally flooded	8, 957	2. 2	Portland silt loam	15, 757	3. 8
Cadeville association, hilly	15, 377	3. 7	Portland clay	9, 214	2. 2
Cadeville fine sandy loam, 5 to 20 percent slopes	884	. 2	Providence silt loam, 1 to 3 percent slopes	1, 697	. 4
Crowley silt loam	2, 411	. 6	Providence silt loam, 3 to 6 percent slopes	10, 169	2. 5
Frizzell silt loam, 0 to 1 percent slopes	21, 367	5. 0	Rilla silt loam, 0 to 1 percent slopes	11, 009	2. 7
Frizzell silt loam, 1 to 3 percent slopes	1, 824	. 5	Rilla silt loam, 1 to 3 percent slopes	3, 120	. 8
Gallion silt loam	2, 856	. 7	Rilla-Hebert complex, gently undulating	2, 067	. 5
Guyton association	8, 913	2. 2	Ruston fine sandy loam, 1 to 3 percent slopes	871	. 2
Guyton-Rosebloom complex, frequently flooded	32, 601	7. 9	Ruston fine sandy loam, 3 to 8 percent slopes	691	. 2
Hebert silt loam	22, 368	5. 4	Ruston fine sandy loam, 8 to 12 percent slopes	411	. 1
Hebert silt loam, gently undulating	765	. 2	Ruston-Lucy association, undulating	27, 860	6. 8
Hebert complex	4, 675	1. 1	Ruston-Lucy association, hilly	55, 540	13. 5
Hebert-Perry complex, gently undulating	1, 096	. 3	Savannah fine sandy loam, 1 to 5 percent slopes	2, 967	. 7
Kirvin-Ruston association, rolling	7, 655	1. 9	Sterlington silt loam, 0 to 1 percent slopes	13, 214	3. 2
Leaf silt loam, occasionally flooded	1, 987	. 5	Sterlington silt loam, 1 to 3 percent slopes	2, 200	. 5
Made land	554	. 1	Terrace escarpments	883	. 2
Muskogee silt loam, 3 to 5 percent slopes	1, 580	. 4	Waller loam	6, 829	1. 6
Ora fine sandy loam, 5 to 8 percent slopes	1, 450	. 4	Wrightsville silt loam	4, 344	1. 1
Ora fine sandy loam, 8 to 12 percent slopes	3, 074	. 7	Water	16, 076	3. 9
			Gravel pits and borrow pits	1, 886	. 5
			Total	411, 520	100. 0

C3—21 to 32 inches, yellowish-brown (10YR 5/4) loamy fine sand; common, medium, distinct, dark-brown (7.5YR 4/4) mottles; single grain; very friable; 15 percent light-gray, uncoated sand grains; medium acid; gradual, smooth boundary.

C4—32 to 57 inches, strong-brown (7.5YR 5/6) loamy fine sand; single grain; very friable; pockets of very pale brown loamy fine sand; strongly acid; gradual, smooth boundary.

C5—57 to 72 inches, light yellowish-brown (10YR 6/4) loamy fine sand; single grain; very friable; strongly acid.

The A horizon ranges from very dark grayish brown to dark yellowish brown. It is 1 to 5 inches thick. The C horizon ranges from light brown or strong brown to yellowish red. Reaction is medium acid to very strongly acid.

Alaga soils are associated with Lucy and Ruston soils. They have sandy lower layers, but Ruston soils are loamy within a depth of 20 inches, and Lucy soils are loamy below a depth of 40 inches.

Alaga-Lucy association, undulating (Aq).—This mapping unit is about 48 percent Alaga soils, 35 percent Lucy soils, and 17 percent included soils. The major soils are sloping and occur on uplands at the extreme western edge of the parish. They are on the wide, smooth tops and long, smooth sides of ridges. The composition of this unit is more variable than that of most other units in the parish but has been controlled well enough for interpreting the expected use of the soils.

Included with these soils in mapping are areas of Ruston soils on the middle and lower slopes and areas of Ora and Savannah soils. Ruston soils have a surface layer of fine sandy loam less than 20 inches thick and slopes of 2 to 5 percent. Ruston soils make up about 5 percent of the mapping unit and Ora and Savannah soils make up about 12 percent.

Alaga soils occur throughout the landscape. They are yellowish-brown loamy fine sand in the upper 10 to 30 inches. The underlying layers are brown to yellowish-red loamy fine sand. Alaga soils are excessively drained, rapidly permeable, low in fertility, and low in available water capacity. They are medium acid to very strongly acid. Slopes range from 2 to 13 percent but average about 7 percent. Droughtiness and poor traction for equipment are major limitations to use.

Lucy soils are dominantly on the lower slopes. These soils have a surface layer of yellowish-brown loamy fine sand about 30 inches thick. The subsoil is a yellowish-red to red sandy loam. Lucy soils are well drained, moderately permeable, low in natural fertility, and moderately low in available water capacity. They are medium acid to very strongly acid. Slopes range from 2 to 12 percent and average about 5 percent. Droughtiness and poor traction for equipment are major limitations to use.

About 40 percent of the acreage is in pine forest and about 60 percent is used for cropland and pasture. A small acreage has been developed for residential use.

These soils are well suited to pine trees. They are fairly well suited to most common cultivated crops and pasture plants (fig. 2) and to some truck crops, such as watermelons and field peas. In most years the Alaga and Lucy soils are droughty late in summer and in fall. In some years they do not contain enough available moisture for cultivated crops and pasture plants. The available moisture is somewhat greater, however, in the Lucy soils than in the Alaga soils. Capability unit IIIs–1 for slopes of 2 to 5 percent, IVs–1 for slopes of 5 to 8 percent, VIe–3 for slopes of 8 to 13 percent; woodland group 3s3 for Alaga soil and 3s2 for Lucy soil.

Alligator Series

The soils of the Alligator series are poorly drained and clayey throughout. They are level or depressional and occur in broad areas, mostly on the Bayou D'Arbonne bottom land.

Figure 2.—**Watermelons and cantaloupes on Alaga-Lucy association, undulating.**

In a representative profile, the surface layer is mainly gray and dark grayish-brown clay about 8 inches thick. The underlying layers are gray clay mottled with yellowish brown, reddish brown, and strong brown.

Representative profile of Alligator clay in a wooded area on the west side of the Whites Ferry Road, in the northwest part of sec. 28, T. 19 N., R. 3 E.:

A11—0 to 2 inches, very dark grayish-brown (10YR 3/2) clay; weak, fine, subangular blocky structure; friable; 25 percent matted roots and leaves; very strongly acid; abrupt, smooth boundary.

A12—2 to 8 inches, gray (10YR 5/1) and dark grayish-brown (10YR 4/2) clay; common, medium, faint, dark yellowish-brown (10YR 4/4) mottles; moderate, medium, subangular blocky structure; friable; some ped exteriors stained dark reddish brown; very strongly acid; clear, smooth boundary.

C1g—8 to 18 inches, gray (10YR 5/1) clay; common, medium, faint, yellowish-brown (10YR 5/4) mottles; strong, medium, subangular blocky structure; firm; red root stains outside peds; very strongly acid; clear, wavy boundary.

C2g—18 to 31 inches, gray (10YR 5/1) clay; many, medium, prominent, reddish-brown (5YR 5/4) and strong-brown (7.5YR 5/6) mottles; weak, coarse, prismatic structure parting to strong, fine, angular blocky; firm; few slickensides; very strongly acid; gradual, wavy boundary.

C3g—31 to 36 inches, gray (10YR 5/1) clay; many, medium, faint yellowish-brown (10YR 5/4) and distinct strong-brown (7.5YR 5/6) mottles; weak, coarse, prismatic structure parting to moderate, medium, angular blocky; firm; many slickensides; very strongly acid; gradual, smooth boundary.

C4g—36 to 50 inches, gray (10YR 5/1) clay; common, fine, faint, yellowish-brown (10YR 5/4) and strong-brown (7.5YR 5/6) mottles; weak, coarse, prismatic structure; very firm; many slickensides; very strongly acid; gradual, smooth boundary.

C5g—50 to 65 inches, gray (10YR 5/1) clay; common, medium, distinct, yellowish-red (5YR 5/6) and yellowish-brown (10YR 5/6) mottles; moderate, fine, angular blocky structure; firm; few, fine, black concretions; few slickensides; very strongly acid; clear, smooth boundary.

C6g—65 to 78 inches, gray (N 5/0 to 10YR 5/1) clay that has many pockets and lumps of reddish-brown clay; moderate, fine, angular blocky structure; firm; few slickensides; medium acid.

The A horizon ranges from very dark gray to grayish brown in color and from 5 to 15 inches in thickness. The C horizon is gray to light brownish gray and is clay or silty clay. Reaction is strongly acid to very strongly acid in the upper 40 inches but ranges to moderately alkaline below this depth.

Alligator soils are associated with Leaf, Wrightsville, and Perry soils. They have a more clayey surface layer than Leaf and Wrightsville soils and do not have a Bt horizon, which is typical of those soils. They do not have reddish alkaline layers, which occur below a depth of 30 inches in Perry soils.

Alligator clay (Ac).—This is a poorly drained, clayey soil on bottom lands. It is level or depressional and oc-

curs in broad areas. Some areas are subject to occasional flooding.

The surface layer is gray or grayish-brown clay about 5 inches thick. The lower layers are light brownish-gray or gray clay.

Included with this soil in mapping are small areas of Perry and Wrightsville soils.

Alligator clay is low in natural fertility and strongly acid to very strongly acid. Permeability is very slow, and runoff is slow. The available water capacity is moderate. This soil is generally wet during winter and spring. It becomes cloddy when worked, and seedbed preparation is difficult. Cracks form when the soil is dry. Good tilth is difficult to maintain. Wetness, poor tilth, and very high shrink-well potential are major limitations. Drainage is needed to remove excess surface water if cultivated crops or pasture plants are grown.

About 80 percent of the acreage is in soybeans, small grain, or pasture. The rest is mostly in hardwoods. A small acreage is used for residential sites. This soil is well suited to rice and is fairly well suited to soybeans and other cultivated crops and pasture plants common in the area. It is not well suited to corn and Coastal bermudagrass. Capability unit IIIw–1; woodland group 2w6.

Alligator clay, frequently flooded (Af).—This is a poorly drained, clayey soil that is subject to frequent flooding. It occurs in low broad, depressional areas, mostly on the Bayou D'Arbonne flood plain.

This soil has the profile described as representative of the Alligator series. The surface layer is dark grayish-brown clay about 8 inches thick. The underlying layers are gray or gray and reddish-brown clay.

Included with this soil in mapping are small areas of Perry and Leaf soils.

This Alligator soil is low in natural fertility and very strongly acid. Permeability is very slow, and surface runoff is slow to very slow. The available water capacity is moderate. This soil is subject to deep flooding by the Ouachita River and Bayou D'Arbonne. Flooding is frequent and lasts for periods of 1 to 5 weeks. Deep cracks form when the soil is dry. The flood hazard, wetness, poor tilth, and very high shrink-swell potential are major limitations.

Practically all the acreage is in hardwood forest. The frequent flooding generally makes this soil unsuitable for cultivated crops. At the highest elevations, this soil is fairly well suited to common bermudagrass. Capability unit Vw–1; woodland group 3w6.

Barclay Series

The soils of the Barclay series are somewhat poorly drained and loamy throughout. They occur on the flood plain of the Ouachita River.

In a representative profile, the surface layer is dark grayish-brown silt loam about 4 inches thick. The subsoil is silt loam about 44 inches thick. The upper part is dark brown, the middle is light brownish gray, and the lower part is dark brown. The upper and lower parts have grayish mottles, and the middle has brownish mottles.

Representative profile of Barclay silt loam on a power-line right-of-way 147 feet west of the Ouachita River, in the southeast part of sec. 24, T. 17 N., R. 3 E.:

Ap—0 to 4 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable; medium acid; clear, smooth boundary.

B1—4 to 15 inches, dark-brown (7.5YR 4/4) silt loam; many, medium, distinct, light brownish-gray (10YR 6/2) and strong-brown (7.5YR 5/6) mottles; weak, medium, subangular structure; friable; thin, light brownish-gray silt coatings on peds; very strongly acid; clear, smooth boundary.

B21—15 to 32 inches, light brownish-gray (10YR 6/2) silt loam; many, medium, distinct, strong-brown (7.5YR 5/6) mottles; weak, coarse, subangular blocky structure; friable; many worm casts; few thin clay films in pores; very strongly acid; gradual, smooth boundary.

B22—32 to 48 inches, dark-brown (7.5YR 4/4) silt loam; common, medium, distinct, light brownish-gray (10YR 6/2) and pale-brown (10YR 6/3) mottles; weak, coarse, subangular blocky structure; friable; few thin clay films in pores; thin light brownish-gray silt coatings in vertical cracks; very strongly acid; clear, smooth boundary.

IIC—48 to 72 inches, brown (7.5YR 5/4) very fine sandy loam to silt loam; common, coarse, faint, dark-brown (7.5YR 4/4) mottles; massive; very friable; vertical streaks of pale brown; strongly acid.

The A horizon ranges from dark grayish brown to yellowish brown and is 1 to 6 inches thick. The B horizon is typically brown mottled with 5 to 30 percent gray, but in places is dominantly gray. The profile ranges from silt loam to very fine sandy loam. Reaction ranges from medium acid to very strongly acid in the A horizon and from strongly acid to very strongly acid in the B horizon.

Barclay soils are associated with Perry and Rosebloom soils. They are not so clayey as the Perry soils and are better drained than the Rosebloom soils.

Barclay-Rosebloom complex, occasionally flooded (Br).—This mapping unit is 65 percent Barclay silt loam and 25 percent Rosebloom silt loam. These undulating soils are on ridges and in swales adjacent to the Ouachita River. Flooding occurs in most years, especially in winter and spring. The ridges are 80 to 400 feet wide and have slopes of 1 to 8 percent, and the swales are 30 to 200 feet wide.

Included in this complex in mapping, above the Ouachita River, are escarpments that have slopes of 8 to 25 percent. Also included are a few sandbars.

Barclay soils are somewhat poorly drained and are on the ridges. Their surface layer is dark grayish-brown silt loam 4 inches thick. The subsoil is dark-brown silt loam mottled with brown and gray. These soils have medium surface runoff, moderate permeability, high available water capacity, and medium natural fertility. They are medium acid to very strongly acid.

Rosebloom soils are poorly drained and are in the swales. Their surface layer is dark grayish-brown to gray silt loam about 4 inches thick. The subsoil is gray silt loam or silty clay loam. These soils have a slow surface runoff, slow permeability, high available water capacity, and low natural fertility. They are medium acid to very strongly acid. Wetness is a major limitation to use.

Most of the acreage is hardwood forest. Fast-moving floodwater makes the soils poorly suited to common crops. Summer annuals, such as soybeans, may be grown, but risk of damage by flooding is high. Capability unit IVw–3; woodland group 2w5 for Barclay soil and 2w9 for Rosebloom soil.

Cadeville Series [2]

The soils of the Cadeville series are moderately well drained. They have a loamy surface layer and mainly a clayey subsoil. They are strongly sloping to steep soils that are dominantly in the southwestern part of the parish.

In a representative profile the surface layer is mainly brown fine sandy loam about 7 inches thick. The subsoil is mainly silty clay to a depth of 46 inches. It is brown in the upper 5 inches, yellowish red in the next 11 inches, and light brownish gray in the lower 12 inches. The upper part has reddish and grayish mottles, and the lower part has brownish mottles.

Representative profile of a Cadeville fine sandy loam in a wooded area on a pipeline right-of-way west of Luna, in the southwest part of sec. 28, T. 16 N., R. 2 E.:

A1—0 to 1 inches, dark grayish-brown (10YR 4/2) fine sandy loam; common, fine, faint, pale-brown (10YR 6/3) and yellowish-brown (10YR 5/4) mottles; weak, fine, granular structure; friable; many wormholes; strongly acid; abrupt, wavy boundary.

A2—1 to 7 inches, brown (10YR 5/3) fine sandy loam; weak, medium, subangular blocky structure; very friable; medium acid; abrupt, smooth boundary.

B1t—7 to 12 inches, brown (7.5YR 5/4) silty clay loam; common, medium, distinct, light brownish-gray (10YR 6/2) mottles; moderate, fine and medium, subangular blocky structure; firm; patchy yellowish-red coating on ped surfaces; thin clay films in pores; strongly acid; clear, smooth boundary.

B2t—12 to 23 inches, yellowish-red (5YR 4/6) silty clay; common, medium, prominent, grayish-brown (10YR 5/2) mottles and a few, fine, distinct, red (2.5YR 4/6) mottles; moderate, medium, subangular blocky structure; firm; many pores; few thin clay films on peds and in pores; few yellowish-brown concretions; very strongly acid; clear, smooth boundary.

B31t—23 to 34 inches, light brownish-gray (10YR 6/2) silty clay; few, fine, faint, yellowish-brown (10YR 5/6) mottles; weak, coarse, angular blocky structure; very firm; few thin clay films on outside of larger peds; few yellowish-brown concretions; few slickensides; very strongly acid; abrupt, smooth boundary.

B32—34 to 46 inches, light brownish-gray (2.5Y 6/2) silty clay; many, medium, distinct, dark-brown (10YR 3/3) and strong-brown (7.5YR 5/6) mottles; very firm; yellowish-brown clay to sandy clay in horizontal bands 1 to 2 inches wide; few thin clay films on vertical cracks and ped faces; few slickensides; very strongly acid; abrupt, smooth boundary.

C1—46 to 54 inches, grayish-brown (2.5Y 5/2) silty clay; common, fine, faint, yellowish-brown (10YR 5/4) mottles; weak, coarse, subangular blocky structure; firm; very strongly acid; clear, smooth boundary.

C2—54 to 64 inches, light brownish-gray (2.5Y 6/2) silty clay; common, medium, distinct, strong-brown (7.5YR 5/6) mottles and a few, fine, yellowish-red (5YR 5/6) mottles; weak, coarse and medium, platy structure; firm; very strongly acid; clear, smooth boundary.

C3—64 to 78 inches, grayish-brown (2.5Y 5/2) silty clay; few, fine, faint, light brownish-gray (10YR 6/2) mottles; massive to weak, coarse, angular blocky structure; firm; very strongly acid.

The A horizon ranges from dark grayish brown to yellowish brown or brown and from fine sandy loam to very fine sandy loam and is 1 to 8 inches thick. The B horizon ranges from dominantly red mottled with gray and brown in the upper 10 inches to dominantly gray mottled with red and brown in the lower part. The B horizon is clay or silty clay to a depth of 40 inches and ranges to sandy clay loam below this depth. A layer, 5 inches or less thick, is at the top of the B horizon and is loam, clay loam, sandy clay loam, or silty clay loam. Reaction ranges from medium acid to very strongly acid in the A horizon and from strongly acid to very strongly acid in the B and C horizons.

Cadeville soils are associated with Ruston, Ora, and Kirvin soils. They are more poorly drained than each of these soils and are finer textured in the B horizon than Ruston and Ora soils.

Cadeville association, hilly (Ca).—This mapping unit is 55 percent Cadeville soils, 9 percent Ora soils, 9 percent Kirvin soils, and 27 percent included soils. These are strongly sloping to steep soils on narrow ridgetops and slopes in the western and southwestern parts of the parish. The composition of this unit is more variable than that of most other units in the parish but has been controlled well enough for interpretation for the expected use of the soils.

Included with these soils in mapping are areas of soils that have 6 inches of yellowish-brown silt loam to clay loam in the upper part of the subsoil and red and gray mottled clay underlying material. These inclusions make about 10 percent of the mapping unit. Also included are areas of Ruston and Savannah soils on ridges and wet soils around the base of slopes and at the heads of narrow drainageways.

Cadeville soils have a surface layer of brown fine sandy loam about 6 inches thick and a subsoil of red and gray mottled silty clay. Slopes range from 5 to 25 percent and average 18 percent. These soils are moderately well drained, very slowly permeable, low in natural fertility, and medium acid to very strongly acid. They have a moderate available water capacity.

Ora soils are on the middle and lower slopes. They have a surface layer of brown fine sandy loam 8 inches thick and a subsoil of yellowish-red to strong-brown sandy clay loam. Below this is a fragipan. Slopes range from 5 to 20 percent but average 14 percent. Ora soils are moderately well drained, low in natural fertility, moderately permeable, medium acid to very strongly acid, and moderate in available water capacity.

Kirvin soils are on the middle and upper slopes and on the faces of some hills that have abrupt slopes near deep drains. Kirvin soils have a surface layer of brown fine sandy loam about 5 inches thick and a subsoil of red to yellowish-red sandy clay that is mottled with yellow and brown. The slopes range from 5 to 35 percent but average 20 percent. These soils are well drained, moderately slowly permeable, low in natural fertility, medium acid to very strongly acid, and moderate in available water capacity.

About 90 percent of the acreage is in pine and hardwoods and 10 percent is used for pasture.

Steep slopes make the soils generally poorly suited to cultivated crops. The smooth ridgetops are suited to pasture. Pine and hardwood trees are well suited. Capability unit IIIe–1 for Ora soil 5 to 8 percent slopes; IVe–1 for Kirvin soil 5 to 8 percent slopes and Ora soil 8 to 12 percent slopes; VIe–1 for Kirvin soil 8 to 35 percent slopes and Ora soil 12 to 20 percent slopes; and VIe–2 for Cadeville soil 5 to 25 percent slopes. Woodland group 3c2 for Cadeville soil and 3o7 for Kirvin and Ora soils.

Cadeville fine sandy loam, 5 to 20 percent slopes (CdE).—This is a moderately well drained, steep soil that

[2] This series includes soils that were formerly called Susquehanna soils.

has a clayey subsoil. It occurs in the western half of the parish and is at lower elevations than the associated Ruston soils.

The surface layer is brown or grayish-brown fine sandy loam about 5 inches thick. The subsoil is red and gray mottled silty clay; the proportion of red decreases with depth.

Included with this soil in mapping are small areas where the subsoil is yellowish brown and ranges from silty clay loam to clay.

This soil has low natural fertility. It is medium acid to very strongly acid. Permeability is very slow, surface runoff is rapid, and the available water capacity is moderate. Good tilth is difficult to maintain. The steep slopes and the clayey subsoil that restrict root development are major limitations to use.

About 60 percent of the acreage is in pine and hardwoods. The rest is used for pasture or is idle. This soil is poorly suited to cultivated crops and pasture. Capability unit VIe–2; woodland group 3c2.

Crowley Series

The soils of the Crowley series are poorly drained to somewhat poorly drained and have a loamy surface layer and a clayey subsoil. They are level and occur in broad areas in the southeastern part of the parish. They are not on flood plains.

In a representative profile, the surface layer is dark grayish-brown silt loam about 7 inches thick. The subsurface layer is grayish-brown silt loam 10 inches thick. The subsoil is grayish-brown clay mottled with red to a depth of 36 inches and light olive-brown clay mottled with red and yellowish brown below that depth.

Representative profile of Crowley silt loam in native grass 390 feet north of the Harman-Johnson Road near a gravel pit, in the northeast part of sec. 9, T. 16 N., R. 4 E.:

Ap1—0 to 4 inches, dark grayish-brown (10YR 4/2) silt loam; few, fine, faint, grayish-brown (10YR 5/2) mottles; weak, coarse, subangular blocky structure; friable; few, fine, soft, black concretions; slightly acid, abrupt, smooth boundary.

Ap2—4 to 7 inches, dark grayish-brown (10YR 4/2) silt loam; common, fine, faint, grayish-brown (10YR 5/2) mottles; weak, medium, subangular blocky structure; friable; few, fine, black concretions; slightly acid; abrupt, wavy boundary.

A21g—7 to 14 inches, grayish-brown (10YR 5/2) silt loam; few, fine, distinct, dark-brown (7.5YR 4/4) mottles; weak, medium, subangular blocky structure; friable; many worm casts; few, fine, soft, black concretions; very strongly acid; clear, smooth boundary.

A22g—14 to 17 inches, grayish-brown (2.5Y 5/2) silt loam; common, fine, distinct, yellowish-brown (10YR 5/6) and dark-brown (7.5YR 4/4) mottles; weak, coarse, subangular blocky structure; friable; few, soft, fine, black concretions; many pores; very strongly acid; abrupt, wavy boundary.

B21tg—17 to 30 inches, grayish-brown (2.5Y 5/2) clay; many, medium, prominent, red (2.5YR 4/6) mottles; strong, fine, angular blocky structure; firm; common patchy clay films in lower part; few, fine, hard, brown concretions; very strongly acid; gradual, wavy boundary.

B22tg—30 to 36 inches, grayish-brown (2.5Y 5/2) clay; common, fine, prominent, red (2.5YR 4/6) and yellowish-brown (10YR 5/6) mottles; moderate, coarse, angular blocky structure; very firm; few, soft, fine, black concretions; few patchy clay films; very strongly acid; gradual, smooth boundary.

B3—36 to 48 inches, light olive-brown (2.5Y 5/4) clay; few, fine, prominent, red (2.5YR 4/6) and yellowish-brown (10YR 5/8) mottles; moderate, fine, angular blocky structure; very firm; common, fine, hard, brown concretions; slightly acid.

The A1 or Ap horizon ranges from very dark grayish brown to grayish brown and is 2 to 8 inches thick. The very dark grayish-brown part is less than 6 inches thick. The A2 horizon ranges from grayish brown to light brownish gray and is 7 to 15 inches thick. The B horizon is gray or grayish brown to olive brown below a depth of 30 inches. Below this depth, the texture is clay or silty clay loam to clay. Reaction ranges from slightly acid to very strongly acid in the A horizon and from very strongly acid in the upper part of the B horizon to neutral below a depth of 30 inches.

The Crowley soils are associated with Perry, Portland, Alligator, and Wrightsville soils. They are slightly better drained than Alligator, Perry, and Wrightsville soils and are not so red in the B horizon as Portland soils.

Crowley silt loam (Cr).—This is a level, poorly drained, acid soil that has a clayey subsoil. It occurs in broad areas on terraces in the southeastern part of the parish. Occasionally some areas are flooded for short periods after heavy rainstorms.

The surface layer is dark-grayish brown silt loam about 7 inches thick. The subsurface layer is a grayish-brown silt loam about 10 inches thick. The subsoil is grayish-brown clay mottled with yellowish-brown and red.

Included with this soil in mapping are small areas of Wrightsville silt loam and a few areas where slopes are 1 to 3 percent.

This Crowley soil is low in natural fertility. It is medium acid to very strongly acid in the upper part of the subsoil and in places ranges to slightly acid or neutral below. Permeability is very slow, and surface runoff is slow. The available water capacity is moderate. This soil is generally wet in winter and spring, but in some years cultivated crops and pasture plants are damaged from lack of moisture late in summer and in fall. The surface tends to become crusted in cultivated areas. Wetness is a major limitation to use. Drainage is needed for cultivated crops and pasture.

Practically all the acreage is used for cultivated crops and pasture. A small acreage is in pines and hardwoods. This soil is well suited to rice and fairly well suited to soybeans and other cultivated crops commonly grown in the area. Capability unit IIIw–4; woodland group 3w9.

Frizzell Series

The soils of the Frizzell series are somewhat poorly drained and loamy. They have a high silt content. They are level to nearly level and occur in broad areas in the eastern two-thirds of the parish. They are not on flood plains.

In a representative profile, the surface layer is brown silt loam 2 inches thick. The subsoil is mainly yellowish brown mottled with light brownish gray. It is silt loam in the upper 41 inches, silty clay loam in the next 13 inches, and loam below.

Representative profile of a Frizzell silt loam in pine woodland 3.5 miles east of Fairbanks, 250 feet north of State Highway 134, in the southwest part of sec. 5, T. 19 N., R. 5 E.:

A1—0 to 2 inches, brown (10YR 4/3) silt loam; weak, fine, granular structure; friable; many roots; very strongly acid; abrupt, smooth boundary.

B&A21—2 to 22 inches, yellowish-brown (10YR 5/4) silt loam; common, medium, distinct, light brownish-gray (10YR 6/2) mottles and few, fine, faint, yellowish-brown (10YR 5/8) mottles; weak, medium, subangular blocky structure; friable; few roots; many fine pores; very strongly acid; diffuse, smooth boundary.

B&A22—22 to 35 inches, yellowish-brown (10YR 5/4) silt loam; common, medium, faint, light brownish-gray (10YR 6/2) mottles; weak, medium, subangular blocky structure; friable; few fine pores; discontinuous bleached sand grains on ped faces; few, hard, black concretions; very strongly acid; gradual, wavy boundary.

B21t—35 to 43 inches, about 55 percent mottled yellowish-brown (10YR 5/4) and 45 percent mottled gray (10YR 6/1) silt loam; few, medium, distinct, strong-brown (7.5YR 5/6) mottles; weak, medium, subangular blocky structure; friable; few roots; few fine pores; few black and few brown concretions; few patchy clay films; continuous clay films in root channels; very strongly acid; abrupt, wavy boundary.

B22t—43 to 56 inches, 55 percent mottled yellowish-brown (10YR 5/4) and 45 percent mottled gray (10YR 6/1) silty clay loam; moderate, medium, subangular blocky structure; firm; common fine pores; clay films continuous on major ped faces; few, medium, brown concretions; very strongly acid; abrupt, wavy boundary.

B3t—56 to 75 inches, yellowish-brown (10YR 5/4) loam; many, medium, faint, pale-brown (10YR 6/3) mottles and few, medium, distinct, strong-brown (7.5YR 5/6) mottles; weak, medium, subangular blocky structure; friable; few fine pores; few clay films on ped faces and in pores; very strongly acid.

The A horizon ranges from dark grayish brown to yellowish brown. The B&A2 horizon ranges from brown to yellowish brown and is 18 to 40 inches thick. Mottles are gray or brown. Texture is silt loam or loam. The B2t horizon ranges from yellowish brown to gray and is silt loam, silty clay loam, or loam. Reaction is medium to very strongly acid.

The Frizzell soils are associated with Guyton and Providence soils. They are better drained than Guyton soils and not so well drained as Providence soils.

Frizzell silt loam, 0 to 1 percent slopes (FrA).—This is a somewhat poorly drained, silty soil on terraces. It is level and occurs in broad areas in the northeastern part of the parish and in the central part along the western side of the Ouachita River. Some areas are occasionally flooded for short periods after heavy rainstorms.

This soil has the profile described as representative for the series. The surface layer is brown silt loam about 2 inches thick. The subsoil is yellowish-brown silt loam mottled with light brownish gray in the upper part. The lower part is gray and brown silty clay loam or silt loam.

Included with this soil in mapping are small areas of Guyton silt loam.

This Frizzell soil is low in natural fertility. It is very strongly acid. Permeability and runoff are slow. The available water capacity is high. This soil is generally wet in winter and spring. Good tilth is fairly easy to maintain, but the surface tends to crust in cultivated areas. Wetness is a major limitation to use, and drainage is needed for cultivated crops or pastures.

About 90 percent of the acreage is in pine and hardwoods. Small areas are used for pasture, mostly on the western side of the river. Most pasture plants are well suited to this soil. Common cultivated crops are not so well suited. Capability unit IIw–2; woodland group 2w8.

Frizzell silt loam, 1 to 3 percent slopes (FrB).—This is a somewhat poorly drained, silty soil on terraces. It occurs in long, narrow areas in the northeastern part of the parish and in the central part along the western side of the Ouachita River.

The surface layer is grayish-brown to yellowish-brown silt loam. The subsoil is yellowish-brown silt loam mottled with gray and brown.

Included with this soil in mapping are small areas of Providence soils and small areas where slopes are 3 to 5 percent.

This Frizzell soil is low in natural fertility. The reaction is medium acid to very strongly acid. Permeability is slow, and runoff is medium. The available water capacity is high. This soil is generally wet in winter and spring. Good tilth is fairly easy to maintain. In some years cultivated crops and pasture plants are damaged by lack of moisture in summer and fall. Erosion control practices are needed where the soil is clean tilled.

More than 90 percent of the acreage is in pine and mixed hardwoods. A small acreage is used for pasture. This soil is better suited to the pasture plants commonly grown in the area than to cultivated crops. Capability unit IIw–2; woodland group 2w8.

Gallion Series

The soils of the Gallion series are well drained and loamy throughout. They occur on the higher natural levees that border the Ouachita River, Bayou DeSiard, and other streams.

In a representative profile, the surface layer is brown silt loam about 9 inches thick. The subsoil is mainly reddish-brown silt loam in the upper 24 inches and dark-brown loam in the lower 10 inches.

Representative profile of Gallion silt loam in a cotton-field between Interstate Highway No. 20 and Milhaven Road, in the northeast part of sec. 2, T. 17 N., R. 4 E.:

Ap1—0 to 5 inches, brown (10YR 5/3) silt loam; mainly weak, fine, granular structure; friable; fine platy structure in lower half inch of horizon; slightly acid; abrupt, wavy boundary.

Ap2—5 to 9 inches, brown (10YR 5/3) silt loam; few, medium, distinct, dark-brown (7.5YR 4/4) mottles; weak, coarse, subangular blocky structure; friable; few, soft, brown concretions; slightly acid; abrupt, smooth boundary.

B1t—9 to 13 inches, reddish-brown (5YR 4/4) silt loam; weak, medium, subangular blocky structure; friable; thin brown coatings on ped surfaces; few, soft, brown concretions; medium acid; gradual, wavy boundary.

B2t—13 to 19 inches, yellowish-red (5YR 4/6) silty clay loam; weak, coarse, subangular blocky structure; friable; thin brown coatings on peds; many pores; common thin clay films; few, fine, black concretions; slightly acid; gradual, smooth boundary.

B31t—19 to 33 inches, reddish-brown (5YR 4/4) heavy silt loam; weak, coarse, subangular blocky structure; friable; few brown silt coatings on vertical ped faces and in cracks; common continuous clay films on peds; moderately alkaline; clear, smooth boundary.

IIB32t—33 to 43 inches, dark-brown (7.5YR 4/4) loam; weak, medium, subangular blocky structure; friable; few thin clay films; few pores; moderately alkaline; noncalcareous; abrupt, smooth boundary.

IIIC—43 to 48 inches, thinly stratified reddish-brown (5YR 4/4) silty clay loam and brown (7.5YR 5/4) silt loam; friable; pockets of medium-size calcium carbonate concretions; moderately alkaline; calcareous.

The Ap horizon ranges from dark grayish brown to yellowish brown. Below the plow layer, the A horizon is very dark gray in some places. The B horizon ranges from dark brown to reddish brown and yellowish red. It is 30 to 50 inches

thick and is silt loam, loam, or silty clay loam. Reaction ranges from medium acid to slightly acid in the A horizon and to moderately alkaline within a depth of 40 inches.

Gallion soils are associated with Rilla, Sterlington, and Hebert soils. They are less acid in the B horizon than those soils. They are finer textured in the B horizon than Sterlington soils. They are better drained than Hebert soils.

Gallion silt loam (Ga).—This is a level, well-drained loamy soil on bottom lands. It occurs as broad areas along the natural levee of the Ouachita River and Bayou De Siard. The surface layer is brown or dark grayish-brown silt loam about 9 inches thick. The subsoil is reddish-brown or brown silty clay loam more than 30 inches thick.

Included with this soil in mapping are small areas of Rilla and Hebert soils and small areas where the subsoil is gray and mottled and where the surface layer is very dark grayish brown and more than 5 inches thick.

Permeability is moderately slow, and surface runoff is medium. Natural fertility is high. The available water capacity is high. This soil is easily cultivated throughout a wide range of moisture content. It is medium to slightly acid in the upper 15 inches and slightly acid to moderately alkaline below. Lime generally is not needed, but nitrogen, potassium, and phosphorus are.

All the acreage is cleared and used intensively for cultivation. This is one of the most productive soils in the parish and is suited to most all crops commonly grown (fig. 3). Only normal good farming practices are needed for continuous cultivation. Capability unit I–1; woodland group 2o4.

Guyton Series

The soils of the Guyton series are poorly drained and loamy throughout. They occur in broad depressional areas and in drainageways in the northeastern and western parts of the parish.

In a representative profile, the surface layer is grayish-brown silt loam 6 inches thick. The subsurface layer, between depths of 6 and 23 inches, is light brownish-gray

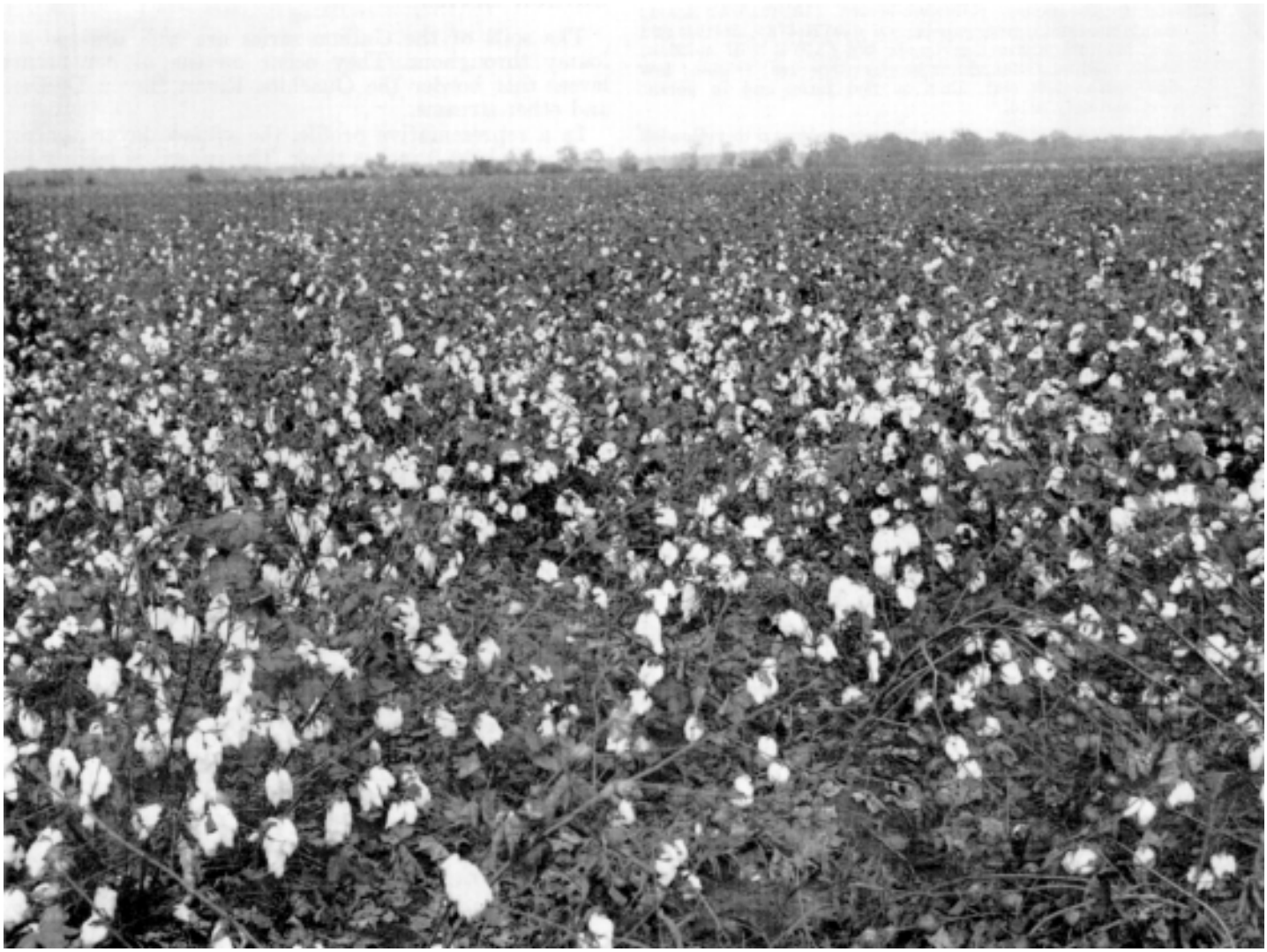

Figure 3.—Cotton on Gallion silt loam.

silt loam. The subsoil is gray silty clay loam in the upper 12 inches, grayish-brown loam in the next 11 inches, and gray clay loam in the lower 24 inches.

Representative profile of Guyton silt loam in a wooded area on the flood plain of Guyton Creek, 16 miles southwest of Monroe in the southwest part of sec. 28, T. 17 N., R. 1 E.:

A1g—0 to 6 inches, grayish-brown (10YR 5/2) silt loam; common, medium, faint, dark yellowish-brown (10YR 4/4) mottles; weak, medium, subangular structure; friable; strongly acid; clear, smooth boundary.

A21g—6 to 11 inches, light brownish-gray (10YR 6/2) silt loam; common, medium, faint, dark yellowish-brown (10YR 3/4) mottles; weak, medium, subangular blocky structure; friable; few, fine, soft-brown concretions; strongly acid; clear, wavy boundary.

A22g—11 to 23 inches, light brownish-gray (2.5Y 6/2) silt loam; common, medium, distinct, dark yellowish-brown (10YR 3/4) and dark-brown (10YR 4/3) mottles; weak, medium, subangular blocky structure; friable; many fine pores stained with dark gray; very strongly acid; clear, irregular to abrupt, irregular boundary.

B21tg—23 to 35 inches, gray (10YR 5/1) light silty clay loam; common, medium, distinct, strong-brown (7.5YR 5/6) and yellowish-brown (10YR 5/6) mottles; weak, coarse, subangular blocky structure; friable; compact, slightly brittle tongues 3 inches wide from A22g horizon extend to a depth of 35 inches; many, thick, discontinuous clay films on vertical faces of coarse blocks; few, thin, patchy clay films on small peds and in pores; the strong-brown mottles are slightly brittle; very strongly acid; clear, wavy boundary.

B22tg—35 to 46 inches, grayish-brown (10YR 5/2) loam; common, medium, distinct, strong-brown (7.5YR 5/6) mottles; weak, coarse and medium, subangular blocky structure; friable; few yellowish-red stains near small concretions; few pockets of clay loam; very strongly acid; clear, smooth boundary.

B3t—46 to 70 inches, gray (10YR 6/1) clay loam surrounding pockets of brittle strong-brown clay loam; few yellowish-red mottles inside brittle peds; weak, coarse, subangular blocky structure; firm; few thin clay films on horizontal ped faces; few, fine, hard, brown concretions; very strongly acid; abrupt, smooth boundary.

Representative profile of a Guyton silt loam, 3.5 miles east of Fairbanks on State Highway 134, northwest part of sec. 5, T. 19 N., R. 5 E. (Sample No. S65La37–24 in tables 9 and 10:

A1—0 to 2 inches, grayish-brown (10YR 5/2) light silt loam, weak, very fine, granular structure; friable; many roots; few, fine, soft, dark-brown concretions; very strongly acid; clear, smooth boundary.

A21—2 to 6 inches, gray (10YR 6/1) light silt loam; few, fine, distinct, yellowish-brown (10YR 5/6) mottles; weak, medium, subangular blocky structure; friable; common roots; many fine pores; few, fine, black concretions; very strongly acid; clear, smooth boundary.

A22—6 to 19 inches, gray (10YR 6/1) light silt loam, weak, medium, subangular blocky structure; friable; very few roots; common fine pores; few, fine, black concretions; very strongly acid; clear, wavy to irregular boundary.

Bt&A2—19 to 24 inches, 55 percent gray (10YR 5/1) and 45 percent yellowish-brown (10YR 5/6) heavy silt loam; weak, medium, subangular blocky structure; firm; very few roots; many fine pores; common distinct clay films in pores; about 20 percent of horizon is gray silt thin ped coatings, spots inside peds, and pockets between peds; very strongly acid; gradual, wavy boundary.

B2t—24 to 35 inches, gray (10YR 5/1) light silty clay loam; common, fine, distinct, yellowish-brown (10YR 5/6) mottles inside peds; moderate, fine, prismatic structure that breaks to moderate, medium, subangular blocky; firm; very few roots; ped surfaces nearly continuously gray and have thin patchy silt coatings; thin patchy clay films; a few, hard, black concretions 5 to 10 millimeters in size; few gray silt krotovinas or cracks 1 to 3 inches wide; very strongly acid; clear, wavy boundary.

B31t—35 to 47 inches, yellowish-brown (10YR 5/4) light silty clay loam inside peds; few, fine, distinct, gray (10YR 6/1) mottles; weak, medium, prismatic structure that breaks to moderate, medium, subangular blocky; firm; very few pores; discontinuous gray (10YR 5/1) on prism surfaces that have patchy gray (10YR 6/1) silt coats; distinct patchy clay films; very few fine concretions; very strongly acid; gradual, smooth boundary.

B32—47 to 68 inches, gray (10YR 6/1) heavy silt loam; many, moderate, distinct, yellowish-brown (10YR 5/6) mottles; weak, coarse, subangular blocky structure; firm; no roots; few fine pores; many yellowish-brown krotovinas 5 to 10 millimeters in size in part of horizon; very strongly acid.

C1—68 to 78 inches, gray (10YR 6/1) heavy silt loam; common, fine, distinct, yellowish-brown (10YR 5/6) mottles; very strongly acid.

The A1 horizon ranges from dark grayish brown to yellowish brown. The A2 horizon ranges from gray to light gray and light brownish gray and is silt loam or loam. The A horizons range from 12 to 26 inches in combined thickness. The B horizon is gray to light brownish gray and is mottled with brown. It is silty clay loam, loam, or silt loam. It ranges from strongly acid to very strongly acid in the upper 30 inches and from medium acid to very strongly acid below.

The Guyton soils are associated with the Rosebloom, Waller, and Frizzell soils. They are more poorly drained than the Frizzell soils, more strongly developed than the Rosebloom soils, and not so sandy as the Waller soils.

Guyton association (Gu).—This mapping unit is about 70 percent Guyton soils and 30 percent less extensive soils. These are poorly drained soils that are dominantly in the northeastern part of the parish. They are level or depressional on long broad flats. The composition of this unit is more variable than that of most other units in the parish but has been controlled well enough for interpreting the expected use of the soils.

The Guyton soils are on the low level or convex ridges. The surface layer of these soils is grayish silt loam about 18 inches thick. The subsoil is gray silty clay loam mottled with yellowish brown. Guyton soils are poorly drained, low in natural fertility, very slowly permeable, and high in available water capacity. They are medium acid to very strongly acid. Slopes are less than 1 percent. Wetness is a major limitation to use.

The rest of the soils in this association occupy the long depressional areas on the landscape. They have a gray silt loam surface layer about 20 inches thick and a gray silt loam or silty clay loam subsoil that is hard and compact. These soils are poorly drained, and water stands on the surface for long periods in winter and spring. In places the subsoil contains excessive amounts of sodium. These soils are low in natural fertility, very slowly permeable, moderate to high in available water capacity, and strongly acid.

About 90 percent of the acreage is in pine and hardwood forest. The depressional areas are dominantly in hardwoods. A small acreage is used for pasture. Several sand and gravel pits are in this association.

These soils are suited to pine and hardwood trees. They are poorly suited to cultivated crops and fairly well suited to pasture plants. The depressional areas are subject to flooding that lasts several weeks. Wetness is a major limitation to use. Capability unit IIIw–3; woodland group 2w9.

Guyton-Rosebloom complex, frequently flooded (Gy).—This mapping unit is about 50 percent Guyton soils

and 30 percent Rosebloom soils. It is in long, narrow areas on the flood plains of most streams west of the Ouachita River. These drainageways range from 200 feet in width for the small ones to more than 3,000 feet for Bayou Choudrant.

Guyton silt loam and Rosebloom silt loam are intermingled and are mapped as one unit. The Guyton silt loam generally occupies the higher elevations and is poorly drained. Rosebloom silt loam is at the same elevations as Guyton silt loam or slightly lower and is often wet from seepage when the Guyton soils are dry.

Included in mapping are areas of soils that are slightly better drained than Guyton and Rosebloom soils or that have a low clay content. These inclusions make up about 20 to 25 percent of each area mapped.

Guyton soils are poorly drained. Their surface layer is grayish-brown silt loam or very fine sandy loam about 6 inches thick. The subsurface layer is light brownish-gray silt loam about 17 inches thick. The subsoil is gray silty clay loam. The soils have slow surface runoff, very slow permeability, high available water capacity, and low natural fertility. They are medium acid to very strongly acid.

The poorly drained Rosebloom soils have a gray to grayish-brown silt loam surface layer about 8 inches thick and a gray silt loam to silty clay loam subsoil. They have slow surface runoff, slow permeability, low natural fertility, and high available water capacity. They are medium acid to very strongly acid.

Practically all the acreage is in hardwoods. Small individually owned areas are cleared for pasture. Wetness and the flood hazard are major limitations to use. Frequent flooding precludes the use of these soils for cultivated crops. Drainage is needed for pasture plants. Capability unit Vw–2; woodland group 2w9.

Hebert Series

The soils of the Hebert series are somewhat poorly drained and are loamy throughout. They occur on the lower parts of natural levees of the Ouachita River, Bayou De Siard, and other streams.

In a representative profile, the surface layer is dark grayish-brown silt loam about 7 inches thick. The subsurface layer is light brownish-gray silt loam 3 inches thick. The subsoil is reddish-brown clay loam, loam, and silty clay loam mottled with shades of gray and brown.

Representative profile of Hebert silt loam in a cultivated field 4.7 miles southeast of Monroe, 325 feet east of State Highway 15, in northwest part of sec. 26, T. 17 N., R. 4 E.:

Ap—0 to 7 inches, dark grayish-brown (10YR 4/2) silt loam; weak, very fine, granular structure; friable; common, very fine, dark yellowish-brown and black, soft concretions; many roots; slightly acid; abrupt, smooth boundary.

A2—7 to 10 inches, light brownish-gray (10YR 6/2) silt loam; very weak, coarse, platy structure to massive; friable; common, fine, dark yellowish-brown and black concretions; few roots; slightly acid; clear, wavy boundary.

B1t—10 to 14 inches, light brownish-gray (10YR 6/2) heavy loam; many, fine, distinct, strong-brown (7.5YR 5/6) mottles and a few, fine, faint, light-gray (10YR 7/2) mottles inside peds; weak, medium, subangular blocky structure; firm; nearly continuous light brownish-gray silt coatings on ped surfaces; common very dark gray clay films in pores and on ped surfaces where silt coatings are absent; common, fine, hard, reddish-brown concretions; very strongly acid; clear, wavy boundary.

B21t—14 to 24 inches, reddish-brown (5YR 5/3) clay loam; common, fine, faint, light brownish-gray (10YR 6/2) mottles inside peds and light brownish-gray (10YR 6/2) mottles on ped surfaces; moderate, medium, prismatic structure that parts to moderate, medium, subangular blocky; firm; very thin light-gray to white silt coatings on prism surfaces; few tongues of gray silt about 5 millimeters wide extend to base of horizon; few, fine, yellowish-red, soft concretions; patchy clay films on ped surfaces and in pores; very strongly acid; clear boundary.

B22t—24 to 30 inches, reddish-brown (5YR 5/4) heavy loam; common, fine, distinct, light brownish-gray (10YR 6/2) mottles inside peds and light brownish-gray (10YR 6/2) mottles on ped surfaces; moderate, medium, prismatic structure that parts to moderate, medium, subangular blocky; firm; prism surfaces have nearly continuous light-gray silt coatings; a few clay films in pores; patchy clay films on ped surfaces; a few, soft, black concretions; very strongly acid; clear, wavy boundary.

B23t—30 to 37 inches, reddish-brown (5YR 4/4) light silty clay loam; common, fine, distinct, brown (7.5YR 5/2) mottles inside peds and brown (7.5YR 5/2) and reddish-brown (5YR 4/4) mottles on ped surfaces; moderate, medium, prismatic structure that parts to moderate, medium, subangular blocky; firm; thin light grayish-brown silt coatings on prism surfaces; thin distinct clay films in pores and on ped surfaces; a few, fine, black concretions; strongly acid; clear, wavy boundary.

B3—37 to 50 inches, brown (7.5YR 5/4) light silt loam; common, fine, distinct, light grayish-brown (10YR 6/2) mottles inside peds and brown (7.5YR 5/4) mottles on ped surfaces; weak, medium, prismatic structure; friable to firm; a few clay films in some pores; common, soft, strong-brown and a few, soft, black ferromanganese concretions; medium acid; gradual boundary.

C—50 to 72 inches, reddish-brown (5YR 5/4) silt loam; common, fine, distinct, light brownish-gray (10YR 6/2) mottles; massive; friable; a few, soft, black stains and concretions; slightly acid.

The A horizon ranges from dark grayish brown to pale brown and is 8 to 20 inches thick. It is silt loam or silty clay loam. The B horizon ranges from dark brown to yellowish red and is heavy silt loam, silty clay loam, clay loam or loam. The B horizon is medium acid to very strongly acid.

The Hebert soils are associated with Gallion, Rilla, Perry, and Portland soils. They are coarser textured than Portland and Perry soils and more poorly drained than Gallion and Rilla soils.

Hebert silt loam (Hb).—This is a nearly level, somewhat poorly drained soil. It occurs as large acreages at intermediate elevations.

This soil has the profile described as representative for the Hebert series. The surface layer is dark grayish-brown silt loam about 10 inches thick. The subsoil is reddish-brown clay loam mottled with gray and brown.

Included with this soil in mapping are small areas of Gallion silt loam and Portland silt loam and small areas where slopes are 1 to 3 percent.

Permeability is moderately slow, and surface runoff is slow. The available water capacity is high. This soil is fairly easy to work. It is medium acid to very strongly acid. Natural fertility is medium.

Practically all the acreage is cleared for row crops or pasture. All crops commonly grown in the area grow well (fig. 4). Wetness and plowpans are limitations to use for cultivated crops. Capability unit IIw–1; woodland group 2w5.

Hebert silt loam, gently undulating (HbB).—This is a somewhat poorly drained soil in a pattern of ridges and swales. It occurs in the northern third of the parish along

Figure 4.—**Rice on Hebert silt loam.**

the natural levee of the Ouachita River. The ridges are 50 to 200 feet wide and have slopes of 1 to 3 percent. Most of the swales are narrow and poorly defined. The surface layer is grayish-brown to brown silt loam about 15 inches thick. The subsoil is reddish-brown silt loam mottled with gray and brown.

Included with this soil in mapping are small areas of Sterlington soils on the ridges and Perry soils in the swales.

This Hebert soil has medium natural fertility. It is medium acid to very strongly acid. The available water capacity is high. Permeability is moderately slow, and surface runoff is medium on the ridges and slow in the swales. Good tilth is easy to maintain on the ridges and somewhat difficult to maintain in the swales. The wet swales make the soil difficult to work and often delay cultivation. Drainage is needed if cultivated crops or pasture plants are grown.

More than half the acreage is in hardwoods. The rest is used for cultivated crops. Most locally grown crops are suited. Capability unit IIw–3; woodland group 2w5.

Hebert complex (He).—This mapping unit is about 60 percent Hebert silt loam, 30 percent a soil similar to Hebert silt loam, and 10 percent included soils. These soils are level and occur in areas that have many shallow swales. The areas range from 40 to 50 acres in size. Some are subject to flooding for short periods. The somewhat poorly drained Hebert silt loam occupies the higher elevations and generally continuous areas on the landscape.

Hebert silt loam has a grayish-brown silt loam surface layer about 10 inches thick and a reddish-brown acid silty clay loam subsoil mottled with gray. The soil in the swales is similar to the Hebert silt loam, but it has an alkaline subsoil.

Included with these soils in mapping are small areas of Gallion and Rilla soils.

These soils are moderately slowly permeable and have slow surface runoff. The available water capacity is high. Natural fertility is medium. Good tilth is fairly easy to maintain.

Most of the acreage is used for cultivated crops or pecan orchards. All the commonly grown crops are suited. Wetness, especially in the swales, is the main limitation to cultivation. Capability unit IIw–1; woodland group 2w5.

Hebert-Perry complex, gently undulating (HpB).—This mapping unit is about 60 percent Hebert soils and 30 percent Perry soils. These soils are on ridges and in swales. They occur mostly in broad belts along distributary channels. Some areas are subject to flooding for short periods. The ridges are gently convex, range from 35 to 200 feet in width, and are less than one-fourth mile long in most places. The slope of the soils on the ridges ranges from 1 to 3 percent. The swales are 30 to 120 feet wide. The somewhat poorly drained Hebert soils are on the ridges, and the poorly drained Perry soils are in the swales.

Included with these soils in mapping are small areas of Portland and Alligator soils.

The Hebert soil has a surface layer of grayish-brown silt loam about 8 inches thick and a subsoil of reddish-brown silty clay loam mottled with gray.

The Perry soil has a gray surface layer that is dominantly clay or silty clay but ranges to silt loam. The subsoil is gray clay underlain by reddish-brown clay.

These soils are medium in natural fertility. Permeability is moderately slow in Hebert silt loam and very slow in the Perry soil. Runoff is medium on the ridges and slow in the swales. The Hebert silt loam has a high available water capacity, and the Perry soil has a moderate available water capacity. The Hebert silt loam is strongly acid to very strongly acid to a depth of several feet. The Perry soil is strongly acid to very strongly acid in the upper 20 inches and ranges to neutral or moderately alkaline within a depth of 40 inches.

The soils on ridges are fairly easy to work, but those in the swales are clayey, wet, and difficult to work. Management is difficult because the surface layer texture of the two soils differs, the swales are wet, and slopes are short and irregular. Drainage is needed where cultivated crops or improved pasture is grown.

These soils are used for pasture, cultivated crops, or hardwoods. They are fairly well suited to most locally grown cultivated crops and pasture plants, but management is difficult. Capability unit IIw–3 for Hebert and Perry soils; woodland group 2w5 for Hebert soil and 2w6 for Perry soil.

Kirvin Series

The soils of the Kirvin series are well drained and have a loamy surface layer and mainly a clayey subsoil. They are strongly sloping to steep and occur in the northwestern part of the parish.

In a representative profile the surface layer is dark yellowish-brown fine sandy loam in the upper 7 inches and strong-brown fine sandy loam in the lower 6 inches. The subsoil is mainly red sandy clay to a depth of 47 inches and light brownish-gray clay below that depth.

Representative profile of Kirvin fine sandy loam in an area of second-growth pine trees at the intersection of McCormick Road and State Highway 15, in the northwest part of the parish, sec. 8, T. 18 N., R. 2 E.:

Ap—0 to 7 inches, dark yellowish-brown (10YR 3/4) fine sandy loam; weak, coarse, subangular blocky structure parting to weak, medium, subangular blocky; friable; strong-brown fine sandy loam in wormholes; few small pieces of flat ironstone; medium acid; clear, smooth boundary.

A3—7 to 13 inches, strong-brown (7.5YR 5/6) fine sandy loam; weak, medium, subangular blocky structure; friable; wormholes filled with dark-brown fine sandy loam; few pieces of ironstone 1 to 2 inches in diameter; medium acid; abrupt, smooth boundary.

B21t—13 to 23 inches, red (2.5YR 4/6) sandy clay; moderate, medium, subangular blocky structure; friable; few small pieces of flat ironstone; many thick clay films; medium acid; clear, smooth boundary.

B22t—23 to 38 inches, red (2.5YR 4/6) sandy clay; common, medium, distinct, brownish-yellow mottles; moderate, medium, subangular blocky structure; friable; common clay films; few small pieces of flat ironstone; very strongly acid; clear, smooth boundary.

B31t—38 to 47 inches, mottled dark-red (1.5YR 3/6), dark reddish-brown (2.5YR 3/4), and very pale brown (10YR 7/3) heavy clay loam to sandy clay; weak, medium, subangular blocky structure that breaks to weak, fine, subangular blocky; firm; few small pieces of ironstone; few clay films; very strongly acid; clear, smooth boundary.

B32—47 to 57 inches, light brownish-gray (2.5Y 6/2) clay; 35 percent dark-red (10R 3/6) mottles; massive; firm; no ironstone visible; very strongly acid; clear, smooth boundary.

C—57 to 72 inches, stratified clay and sandy clay loam mottled with red, yellow, and gray; massive; firm; very strongly acid.

The A horizon is fine sandy loam. It ranges from grayish brown to dark yellowish brown and strong brown and is 5 to 15 inches thick. The B horizon ranges from red to yellowish red and from clay to clay loam. Thickness ranges from 30 to 50 inches. In places gray mottles occur below a depth of 30 inches. Ironstone fragments commonly are in the A and B horizons. The C horizon ranges from clay to sandy clay loam and is red, gray, and brown. Reaction is medium acid to strongly acid in the A horizon and strongly acid to very strongly acid in the B horizon.

The Kirvin soils are associated with Ruston and Cadeville soils. They are better drained than Cadeville soils and finer textured in the B horizon than Ruston soils.

Kirvin-Ruston association, rolling (Kr).—This mapping unit is about 45 percent Kirvin soils, 21 percent Ruston soils, 7 percent Cadeville soils, and 6 percent Ora soils. These are strongly sloping soils on uplands in the northwestern part of the parish. They occur on narrow ridgetops and long slopes. The composition of this mapping unit is more variable than that of most other mapping units in the parish, but it has been controlled well enough for interpreting the expected use of the soils.

Kirvin soils are on slopes. They have a surface layer of dark yellowish-brown fine sandy loam about 13 inches thick. The subsoil is red sandy clay that is underlain by red, brown, and gray clayey material. In some places layers of flat ironstone gravel are within a depth of 40 inches. Kirvin soils are well drained, moderately slowly permeable, low in natural fertility, and moderate in available water capacity. They are medium acid to very strongly acid. Slopes range from 5 to 30 percent and are mostly more than 8 percent.

Ruston soils are on the narrow ridge crests and upper slopes. They have a surface layer of brown fine sandy

loam about 12 inches thick and a subsoil of yellowish-red to red sandy clay loam. Ruston soils are well drained, moderately permeable, low in natural fertility, and moderate in available water capacity. They are strongly acid. Slopes range from 5 to 15 percent and average 9 percent.

Cadeville soils are on the upper slopes. They have a surface layer of brown fine sandy loam about 5 inches thick and a subsoil of red and gray mottled silty clay. Cadeville soils are moderately well drained, very slowly permeable, low in natural fertility, and moderate in available water capacity. They are medium acid to very strongly acid. Slopes range from 5 to 20 percent and average 7 percent.

Ora soils occupy the crests and the short, narrow benches on slopes. They have a surface layer of yellowish-brown fine sandy loam 10 inches thick. The subsoil is yellowish-brown to yellowish-red loam or sandy clay loam and has a compact brown and red loamy substratum. Ora soils are moderately well drained, moderately permeable, low in natural fertility, and moderate in available water capacity. They are medium acid to very strongly acid. Slopes range from 3 to 8 percent.

Included with these soils in mapping are areas of Lucy and Providence soils and areas of wet soils in narrow drainageways.

About 80 percent of the acreage is in pine trees and some hardwoods and about 20 percent is used for truck crops and pasture. A small acreage has been developed for residential use.

In most areas these soils are well suited to pine trees. The smooth ridgetops are well suited to most of the locally grown cultivated crops and pasture plants. The steep slopes are not well suited to cropland. Capability unit IIIe–1 for Kirvin soil 5 to 8 percent slopes and Ora soil 3 to 8 percent slopes; IVe–1 for Ruston soil 5 to 8 percent slopes; VIe–1 for Kirvin soil 8 to 30 percent slopes; and VIe–2 for Ruston soil 8 to 15 percent slopes and Cadeville soil 5 to 20 percent slopes. Woodland group 3o7 for Kirvin and Ora soils, 2o1 for Ruston soil, and 3c2 for Cadeville soil.

Leaf Series

The soils of the Leaf series are poorly drained and have a loamy surface layer and a clayey subsoil. They are adjacent to the Bayou D'Arbonne flood plain.

In a representative profile, the surface layer is dark-brown silt loam 3 inches thick. The subsurface layer is gray silt loam. It overlies a clayey subsoil that extends to a depth of 27 inches. The subsoil is gray and yellowish brown in the upper part and gray mottled with strong brown in the lower part.

Representative profile of Leaf silt loam in a pine and hardwood forest, 5 miles north of West Monroe on the south side of Wall Lake Road, in the southeastern part of NW¼SE¼ sec. 27, T. 19 N., R. 3 E.:

A1—0 to 3 inches, dark-brown (10YR 3/3) silt loam; common, medium, faint, grayish-brown (10YR 5/2) mottles; weak, medium, subangular blocky structure; friable; strongly acid; abrupt, smooth boundary.

A2g—3 to 6 inches, gray (10YR 6/1) silt loam; many, medium, distinct, strong-brown (7.5YR 5/6) and yellowish-brown (10YR 5/4) mottles; weak, medium, subangular blocky structure; friable; very strongly acid; clear, wavy boundary.

B&A2—6 to 15 inches, 70 percent is the gray (10YR 6/1) and yellowish-brown (10YR 5/6) silty clay B part of horizon; 30 percent is the gray (10YR 6/1) silt loam A2 part, which surrounds peds of the B part; moderate, medium, subangular blocky structure; friable; many clay films in B part; many pores; very strongly acid; clear, wavy boundary.

B2tg—15 to 27 inches, gray (10YR 6/1) silty clay; many, medium, distinct, strong-brown (7.5YR 5/6) mottles; weak, coarse, prismatic structure; firm; few patchy clay films; few, fine, soft, black concretions; few pores; very strongly acid; gradual, smooth boundary.

Cg—27 to 48 inches, gray (10YR 6/1) clay; many, medium, distinct, strong-brown (7.5YR 5/6) mottles; weak, coarse, prismatic structure; very firm; few, soft, black concretions; very strongly acid.

The A1 horizon ranges from dark brown to gray. The A2 horizon is gray to light brownish gray. The B horizon is gray or light brownish-gray clay or silty clay 12 to 40 inches thick. Reaction ranges from strongly acid to very strongly acid.

The Leaf soils are associated with Alligator and Perry soils. They are more developed than Alligator soils and lack the reddish, alkaline IIC horizon of Perry soils.

Leaf silt loam, occasionally flooded (Le).—This is a poorly drained soil on terraces adjacent to the flood plain of Bayou D'Arbonne. It is level and subject to occasional flooding.

The surface layer is gray or dark-brown silt loam about 6 inches thick. The subsoil is gray firm clay or silty clay that has a few brown mottles.

Included with this soil in mapping are small areas where the surface layer is silty clay loam and small areas of Alligator clay.

This Leaf soil is low in natural fertility. The reaction is strongly acid to very strongly acid. Permeability is very slow, and surface runoff is slow. The available water capacity is moderate. This soil is generally wet during winter and spring. Practically all of the area is subject to deep flooding in winter and spring. Flooding seldom occurs between May and December. Good tilth is fairly easy to maintain. Flooding and wetness are major limitations to use. Drainage is needed for cultivated crops and pasture.

More than 95 percent of the acreage is pine and hardwood forest. This soil is suited to rice and soybeans where flooding is not too severe. Flooding makes this soil unsuited to most pasture plants except common bermudagrass. Capability unit IVw–1; woodland group 2w9.

Lucy Series

The soils of the Lucy series are well drained and have a thick sandy surface layer and loamy subsoil. They are moderately sloping to steep and occur in the western part of the parish.

In a representative profile, the surface layer is loamy fine sand about 28 inches thick. It is mainly yellowish brown in the upper part and strong brown in the lower part. The subsoil is yellowish-red sandy loam in the upper 14 inches, yellowish-red loam in the next 20 inches, and red loam in the lower 30 inches.

Representative profile of Lucy loamy fine sand in a well-stocked pine wooded area one-eighth mile west of Luna Fire Tower on the north side of a gravel road, in the northwest corner of sec. 24, T. 16 N., R. 2 E.:

A1—0 to 2 inches, dark grayish-brown (10YR 4/2) loamy fine sand, common, fine, faint, yellowish-brown (10YR

5/6) mottles; weak, fine, granular structure; very friable; medium acid; abrupt, smooth boundary.

A21—2 to 10 inches, yellowish-brown (10YR 5/4) loamy fine sand; common, fine, distinct, strong-brown (7.5YR 5/6) mottles; weak, medium, subangular blocky structure; very friable; few pockets of light-gray, uncoated sand grains; medium acid; clear, smooth boundary.

A22—10 to 18 inches, yellowish-brown (10YR 5/4) loamy fine sand; many, large, faint, dark yellowish-brown (10YR 4/4) mottles; weak, medium, subangular blocky structure; very friable; many pockets of light-gray uncoated sand grains; medium acid; clear, smooth boundary.

A3—18 to 28 inches, strong-brown (7.5YR 5/6) loamy fine sand; weak, medium, subangular blocky structure; very friable; pockets of light-gray uncoated sand grains; few vertical veins of pale-brown loamy fine sand; strongly acid; clear, wavy boundary.

B1t—28 to 42 inches, yellowish-red (5YR 4/6) sandy loam; weak, medium, subangular blocky structure; very friable; light-gray uncoated sand grains in pockets and in some root channels; few patchy clay films; vertical veins of pale-brown loamy fine sand; many fine pores; strongly acid; clear, smooth boundary.

B21t—42 to 62 inches, yellowish-red (5YR 4/6) loam; weak, medium, subangular blocky structure; very friable; few thin clay films on ped surfaces; sand grains coated and bridged with clay; pockets of light yellowish-brown loamy fine sand; pockets of light-gray uncoated sand grains; few, fine, soft, black concretions; few fine pores; strongly acid; clear, smooth boundary.

B22t—62 to 92 inches, red (2.5YR 4/6) loam; weak, medium, subangular blocky structure; friable; thin patchy clay films on ped surfaces; sand grains coated and bridged with clay; scattered, uncoated sand grains; very strongly acid.

The A1 horizon is dark grayish-brown to dark yellowish brown. The A2 horizon is yellowish brown to light yellowish brown. The combined thickness of the A horizons is 20 to 40 inches. The B horizon is red to yellowish-red sandy loam to sandy clay loam. Thickness ranges from 50 to 100 inches. The reaction is medium acid to very strongly acid.

The Lucy soils are associated with Ruston, Alaga, and Ora soils. They have finer textured lower layers than Alaga soils, are coarser textured than Ruston and Ora soils, and lack the fragipan of Ora soils.

In this parish Lucy soils are mapped only in soil associations that include other soils. These associations are described under the headings "Alaga Series" and "Ruston Series."

Made Land

Made land (Ma) consists of filled areas or excavated and refilled areas. About 80 percent is smoothed or partly smoothed gravel and sand pits. The rest is spoil banks, dumps, and filled-in industrial and residential sites.

Included in mapping are small isolated undisturbed areas and small shallow borrow areas for sod or road fill.

Soil texture and color are highly variable. Colors are dominantly gray, yellowish brown and red, and texture is silt loam to clay that contains various amounts of gravel.

Most of this land is idle and is mainly in brush and weeds. Small tracts are used for commercial and residential sites. Crops other than pasture are poorly suited. The variable texture, uneven surface, and wetness in some areas are the main limitations to use. Capability unit and woodland group not assigned.

Muskogee Series

The soils of the Muskogee series are moderately well drained and loamy. They are gently sloping and are adjacent to natural drainageways in the southeastern part of the parish.

In a representative profile, the surface layer is very dark grayish-brown silt loam about 3 inches thick. The subsoil is mainly strong-brown silt loam in the upper 17 inches, light brownish-gray silty clay mottled with red in the next 7 inches, and dark-brown silty clay loam in the lower 21 inches.

Representative profile of Muskogee silt loam in a pine forest, 140 feet north of Prairie Road, in the northeastern part of sec. 16, T. 16 N., R. 4 E.:

A1—0 to 3 inches, very dark grayish-brown (10YR 3/2) silt loam; moderate, fine, granular structure; friable; few, fine, soft, black concretions; many roots and wormholes; very strongly acid; clear, smooth boundary.

B21t—3 to 16 inches, strong-brown (7.5YR 5/6) silt loam; moderate, fine, subangular blocky structure; friable; few, fine, brown concretions; few wormholes; few thin patchy clay films; very strongly acid; clear, wavy boundary.

B22t—16 to 20 inches, yellowish-brown (10YR 5/6) silt loam; few, fine, prominent, red (2.5YR 4/8) mottles; moderate, fine, angular blocky structure; few thin clay films; few, fine, hard, brown concretions; friable; very strongly acid; abrupt, smooth boundary.

IIB23t—20 to 27 inches, light brownish-gray (10YR 6/2) silty clay; 50 percent red (2.5YR 4/8) mottles; strong, fine, angular blocky structure; firm; few, hard, brown concretions; thin patchy clay films; 5 to 10 percent gray silt loam around peds in upper 2 or 3 inches; very strongly acid; clear, smooth boundary.

IIB24t—27 to 48 inches, dark-brown (7.5YR 4/4) heavy silty clay loam; weak, coarse, prismatic structure that breaks to strong, fine, angular blocky; thin vertical streaks of light yellowish-brown silt loam; firm; very strongly acid; clear, smooth boundary.

IIB3—48 to 84 inches, dark-brown (7.5YR 4/4) silty clay loam; common, medium, distinct, light brownish-gray (10YR 6/2) mottles; firm; slightly acid at 50 inches increasing to mildly alkaline at 60 inches.

The A horizon is very dark grayish brown to brown silt loam. It ranges from 2 to 10 inches in thickness. The B2t horizons range from brown and yellowish brown to strong brown. The B horizon ranges from silt loam to silty clay loam and from 10 to 25 inches in thickness. In places mottles of red and gray occur below a depth of 30 inches. The IIB2t horizons range from red mottled with gray to gray mottled with red and from silty clay to heavy silty clay loam. The reaction is strongly acid to very strongly acid in the upper 35 inches and ranges to neutral or mildly alkaline below.

The Muskogee soils are associated with Crowley, Wrightsville, and Cadeville soils. They are better drained than these soils and are coarser textured in the B horizon.

Muskogee silt loam, 3 to 5 percent slopes (MuC).—This is a gently sloping, moderately well drained soil on terraces. It occurs in long narrow areas bordering drainageways and terrace escarpments in the eastern part of the parish.

The surface layer is very dark grayish-brown silt loam about 3 inches thick. The subsoil is yellowish-brown to strong-brown silt loam underlain by gray clayey layers.

Included with this soil in mapping are small areas of Crowley and Cadeville soils.

This Muskogee soil has medium natural fertility. It is strongly acid to very strongly acid in the upper 35 inches and ranges to mildly alkaline below. Permeability is slow, and runoff is medium. The available water capacity is high. Good tilth is fairly easy to maintain, and the soil is easy to cultivate. Erosion hazard is the main limitation to use.

Most of the acreage is in second-growth pine forest. There are a few hardwoods. Most all locally adapted

crops and pasture plants are suited. Capability unit IIIe–1; woodland group 3o7.

Ora Series

The soils of the Ora series are moderately well drained, are loamy throughout, and have a brittle fragipan in the lower part of the subsoil. They are strongly sloping and occur in the western half of the parish.

In a representative profile, the surface layer is mainly yellowish-brown fine sandy loam about 13 inches thick. The upper 5 inches of the subsoil is yellowish-red sandy clay loam. The next 22 inches is brownish loam. The lower 20 inches is a fragipan of yellowish-brown and gray loam.

Representative profile of Ora fine sandy loam in pine woodland on the west side of Red Cut Road just south of Prairion Bayou, in the southeast part of sec. 28, T. 16 N., R. 3 E.:

A1—0 to 3 inches, dark grayish-brown (10YR 4/2) fine sandy loam; weak, medium, crumb structure; friable; many worm casts; medium acid; abrupt, smooth boundary.

A2—3 to 9 inches, yellowish-brown (10YR 5/4) fine sandy loam; weak, medium, subangular blocky structure; friable; many worm casts; medium acid; clear, wavy boundary.

A2&B—9 to 13 inches, 70 percent yellowish-brown (10YR 5/4) fine sandy loam and 30 percent strong-brown (7.5YR 5/6) heavy fine sandy loam; weak, medium, subangular blocky structure; friable; many pores; strongly acid; clear, wavy boundary.

B21t—13 to 18 inches, yellowish-red (5YR 5/8) sandy clay loam; weak, medium, subangular blocky structure; friable; continuous clay films; very strongly acid; clear, smooth boundary.

B22t—18 to 26 inches, strong-brown (7.5YR 5/6) loam; weak, medium, subangular structure; friable; discontinuous clay films; patchy yellowish-brown silt coatings; very strongly acid; gradual, smooth boundary.

B23t—26 to 40 inches, yellowish-brown (10YR 5/8) loam; few, medium, distinct, yellowish-red (5YR 5/6) and pale-brown (10YR 6/3) mottles; weak, medium, subangular blocky structure; friable; common patchy clay films; patchy pale-brown silt coats; many pockets of pale-brown fine sandy loam ½ to 1 inch in diameter; very strongly acid; clear, smooth boundary.

Bx1—40 to 52 inches, yellowish-brown (10YR 5/6) loam; common, medium, faint, pale-brown (10YR 6/3), yellowish-red (5YR 5/6), and gray (10YR 5/1) mottles; weak, coarse, subangular blocky structure; firm and brittle; dark-brown coatings on larger peds; many pores; common thin clay films; very strongly acid; clear, smooth boundary.

Bx2—52 to 60 inches, gray (10YR 6/1) and yellowish-brown (10YR 5/6) loam; many, medium, distinct, yellowish-red (5YR 5/6) mottles; weak, medium, subangular blocky structure; firm and brittle; few thin clay films; very strongly acid; clear, smooth boundary.

C—60 inches +, light brownish-gray (2.5Y 6/2) loam; common, medium, distinct, yellowish-brown (10YR 5/4) and red (2.5YR 4/6) mottles; massive; friable; very strongly acid.

The A horizon ranges from dark grayish brown to yellowish brown and pale brown in color and from 5 to 18 inches in thickness. The B2t horizon ranges from yellowish red to strong brown in the upper part to yellowish brown in the lower part. Depth to the Bx horizon ranges from 28 to 42 inches. The B2t and Bx horizons range from loam to sandy clay loam. In the Bx horizon dark-red and gray mottles are typical. Reaction is very strongly acid to medium acid.

The Ora soils are associated with Ruston, Savannah, and Cadeville soils. They are redder in the B horizon than Savannah and Cadeville soils and coarser textured in the B horizon than Cadeville soils. They have a fragipan, but Ruston soils do not.

Ora fine sandy loam, 5 to 8 percent slopes (OrD).—This is a moderately well drained loamy soil on uplands. It occurs in small areas in the western part of the parish.

The surface layer is yellowish-brown fine sandy loam about 8 inches thick. The subsoil is yellowish-red to brown loam or sandy clay loam. It is underlain by a firm and brittle fragipan mottled with gray, brown, and red.

Included with this soil in mapping are small areas that have dark-red plinthite at a depth of 30 to 40 inches.

This soil is low in natural fertility and medium acid to very strongly acid. Permeability is moderate, and surface runoff is medium. The available water capacity is moderate. Good tilth is easily maintained. Erosion is a hazard if the soil is clean tilled.

About 70 percent of the acerage is in pine forest. Most of the remaining acreage is used for pasture and homesites. This soil is suited to most of the locally grown cultivated crops and pasture plants. Capability unit IVe–1; woodland group 3o7.

Ora fine sandy loam, 8 to 12 percent slopes (OrE).—This is a moderately well drained loamy soil in the western part of the parish. It occurs in long narrow areas near the Ouachita River.

This soil has the profile described as representative for the series. The surface layer is yellowish-brown fine sandy loam 13 inches thick. The subsoil is yellowish-red to brown loam or sandy clay loam about 27 inches thick. Below are yellowish-brown, compact and brittle fragipan layers that are mottled with gray. The texture is loam, sandy clay loam, or clay loam.

Included with this soil in mapping are a few outcrops of chert gravel and small areas of Savannah soils.

This Ora soil is low in natural fertility and medium acid to very strongly acid. Permeability is moderate in the layers above the fragipan and moderately slow below. Runoff is rapid. The available water capacity is moderate. Cultivated crops and pasture plants are damaged by lack of moisture in summer and fall. This soil is easy to work and is fairly easy to keep in good tilth. Erosion is a major hazard if the soil is clean tilled.

About 80 percent of the acreage is in pine forest. Most of the remaining acreage is in pasture. This soil is suited to most of the locally grown pasture plants. Because slopes are strong and irregular, this soil is not very well suited to cultivated crops. Capability unit IVe–1; woodland group 3o7.

Ora-Savannah association, gently rolling (Os).—This mapping unit is about 28 percent Ora soils, 25 percent Savannah soils, 15 percent Providence soils, 8 percent Cadeville soils, and 24 percent other soils. These are loamy soils that are well distributed throughout the western half of the parish. They occur on wide smooth tops and short sides of ridges. The composition of this unit is more variable than that of most other units in the parish, but composition has been estimated well enough for interpreting the expected use of the soils.

Ora soils are on short slopes near drainageways. They have a yellowish-brown fine sandy loam surface layer 8 to 15 inches thick and a yellowish-brown to yellowish-red loam or sandy clay loam subsoil. The substratum is compact and brittle, brown sandy clay loam mottled with

gray. Ora soils are moderately well drained, moderately permeable, low in natural fertility, and moderate in available water capacity. They are medium acid to very strongly acid. Slopes range from 3 to 15 percent but average 8 percent.

Savannah soils are on the crests and gentle slopes of low ridges. They have a brown fine sandy loam surface layer 8 inches thick. The subsoil is brown to yellowish-brown sandy clay loam to loam. It is underlain by a gray and brown fragipan at a depth of about 25 inches. Savannah soils are moderately well drained, slowly permeable, low in natural fertility, and moderate in available water capacity. They are medium acid to very strongly acid. Slopes range from 1 to 8 percent but average 4 percent.

Providence soils are at the highest elevations on crests and extreme upper slopes. These soils have a dark grayish-brown silt loam surface layer 10 inches thick. The subsoil is strong-brown silty clay loam underlain by a gray and brown fragipan. Providence soils are moderately well drained, slowly permeable, low in natural fertility, and high in available water capacity. They are medium acid to very strongly acid. Slopes range from 1 to 8 percent but average 5 percent.

Cadeville soils are on widely separated steep slopes that border major drainageways. They have a brown fine sandy loam surface layer about 5 inches thick and a gray silty clay subsoil that is mottled with red in the upper part. Cadeville soils are moderately well drained, very slowly permeable, low in natural fertility, and moderate in available water capacity. They are strongly acid to very strongly acid. Slopes range from 5 to 25 percent but average 10 percent.

Included with these soils in mapping are areas of Ruston soils and wet soils in small drainageways.

About 80 percent of the association is in pine forest, and about 10 percent is used for pasture and truck crops. A large acreage along the western edge of West Monroe has been developed for residential use.

These soils are well suited to pine trees. They generally are well suited to most locally grown cultivated crops and pasture plants. The Cadeville soils are not so well suited to cultivated crops as the other soils in this association. In most years the available moisture in the soils is adequate during the growing season. Capability unit IIe–2 for Providence soil 1 to 3 percent slopes; IIIe–1 for Savannah soil 1 to 5 percent slopes and for Providence soil 3 to 6 percent slopes; IVe–1 for Ora soil 5 to 15 percent slopes; and VIe–2 for Cadeville soil 5 to 25 percent slopes. Woodland group 3o7 for Ora and Savannah soils; 3c2 for Cadeville soil; and 2o7 for Providence soil.

Perry Series

The soils of the Perry series are poorly drained and clayey throughout. They are level or depressional and occur mostly in broad areas of flood plains in the eastern half of the parish.

In a representative profile, the surface layer is mainly dark-gray clay. The subsoil between depths of 8 and 30 inches is dark-gray or gray clay. Below a depth of 30 inches is reddish-brown and brown clay.

Representative profile of Perry clay in a hardwood area 340 feet north of U.S. Highway No. 80, across the road from Russell Sage Wildlife Area headquarters, in the northwest part of sec. 35, T. 18 N., R. 5 E.:

A11—0 to 2 inches, very dark grayish-brown (10YR 3/2) clay; strong, fine, granular structure; firm; many roots; very strongly acid; abrupt, smooth boundary.

A12—2 to 8 inches, dark-gray (10YR 4/1) clay; few, fine, faint, dark yellowish-brown (10YR 4/4) mottles; strong, medium, subangular blocky structure; very firm; many roots; very strongly acid; clear, wavy boundary.

B21g—8 to 14 inches, gray (10YR 5/1) clay; moderate, medium, distinct, strong-brown (7.5YR 5/6) mottles; moderate, medium, subangular blocky structure; very firm; few roots; very strongly acid; clear, wavy boundary.

B22g—14 to 20 inches, dark-gray (10YR 4/1) clay; common, medium, prominent, dark reddish-brown (5YR 3/4) and few, medium, distinct, strong-brown (7.5YR 5/6) mottles; weak, fine, subangular blocky structure to massive; few slickensides having 3- to 5-inch faces; very firm; very few fine roots; slightly acid; gradual, wavy boundary.

B23g—20 to 30 inches, gray (10YR 5/1) clay; common, medium, distinct, strong-brown (7.5YR 5/6) mottles and few, coarse, distinct pockets or mottles of dark reddish gray (5YR 4/2); massive; few slickensides having 5- to 8-inch faces; very firm; few fine roots; neutral; clear, wavy boundary.

IIC1—30 to 35 inches, reddish-brown (5YR 4/3) clay; massive; many slickensides having 8- to 15-inch faces; very firm; very few fine roots; mildly alkaline; gradual, wavy boundary.

IIC2—35 to 52 inches, brown (7.5YR 4/2) clay; few, fine, faint, reddish-brown (5YR 4/3) mottles and few, fine, distinct, gray (10YR 5/1) mottles; massive; many slickensides having 8- to 18-inch faces; very firm; few fine calcium carbonate concretions; moderately alkaline; clear, wavy boundary.

IIICg—52 to 58 inches, gray (10YR 5/1) clay, common medium and coarse, distinct, strong-brown (7.5YR 5/6) mottles and few coarse pockets of dark reddish brown (5YR 3/4); weak, medium, subangular blocky structure; many slickensides; very firm; few clusters of gypsum crystals 5 millimeters across, in gray material; few soft calcium carbonate concretions in red pockets; moderately alkaline.

The A horizon ranges from very dark gray to grayish brown and from silt loam to clay. The B horizon is dark-gray to gray clay. It overlies reddish-brown clay. Depth to the reddish-brown clay ranges from 14 to 40 inches. Reaction is very strongly acid to slightly acid in the upper 20 inches and ranges to moderately alkaline within a depth of 40 inches. In places carbonate concretions are present below a depth of 30 inches.

The Perry soils are associated with Hebert and Portland soils. They are more poorly drained than these soils and are finer textured than Hebert soils.

Perry clay, frequently flooded (Pc).—This is level to depressional poorly drained, clayey soil that is frequently flooded. It is in areas mostly on the west side of the Ouachita River.

The surface layer is dark-gray clay. The subsoil is gray clay. It is underlain at a depth of 20 to 30 inches by reddish-brown clay.

Included with this soil in mapping are small areas of Alligator and Portland soils.

This Perry soil has moderately low natural fertility. It is slightly acid to very strongly acid in the upper 20 inches and ranges to moderately alkaline within a depth of 40 inches. In places calcium carbonate concretions are present below a depth of 30 inches. Permeability is very slow, and runoff is slow. The available water capacity is

moderate. Deep cracks form when this soil is dry, but the cracks close when the soil is wet. This soil is subject to frequent flooding by backwater in winter and late in spring of most years, but flooding is less frequent in summer.

Practically all the acreage is in hardwoods. The flooding hazard precludes use for cultivated crops. Most pasture plants are poorly suited. Capability unit Vw–1; woodland group 3w6.

Perry clay, occasionally flooded (Pe).—This is a level and depressional, poorly drained, clayey soil that is occasionally flooded. It is mostly in broad areas in the eastern half of the parish.

This soil has the profile described as representative for the series. The surface soil is dark-gray clay. The subsoil is gray clay that has a few brown mottles. At a depth of 30 inches, the underlying layers are gray and reddish-brown clay.

Included with this soil in mapping are small areas of Portland and Alligator soils.

This Perry soil is moderately low in natural fertility. It is slightly acid to very strongly acid in the upper 20 inches and ranges to moderately alkaline within a depth of 40 inches. In places carbonate concretions are present below a depth of 30 inches. Permeability is very slow, and runoff is slow. The available water capacity is moderate. In winter and spring, this soil generally is wet and many areas are subject to yearly flooding. The soil becomes cloddy when worked, and seedbed preparation is difficult. Deep cracks form when the soil is dry, but they close when the soil is wet. Good tilth is difficult to maintain. Texture and wetness make cultivation difficult. Drainage and protection from flooding are needed if cultivated crops or pasture plants are grown.

About 60 percent of the acreage is in hardwood forest, and about 30 percent is used for cropland and pasture. This soil is well suited to rice and fairly well suited to soybeans. It is fairly well suited to other cultivated crops and pasture plants commonly grown in the area. Capability unit IVw–2; woodland group 2w6.

Portland Series

The soils of the Portland series are somewhat poorly drained and have a clayey subsoil. They occur on low ridges of flood plains in the eastern half of the parish.

In a representative profile, the surface layer is mainly dark-brown clay about 15 inches thick. The underlying layers are reddish-brown clay.

Representative profile of Portland clay in a hardwood area 1½ miles southeast of Bosco, 144 feet south of a gravel road, in the northeast part of sec. 16, T. 15 N., R. 4 E.:

A11—0 to 3 inches, very dark grayish-brown (10YR 3/2) clay; common, medium, faint, dark grayish-brown (10YR 4/2) mottles; moderate, medium, subangular blocky structure; firm; root channels stained with strong brown; medium acid; clear, smooth boundary.

A12—3 to 9 inches, dark-brown (7.5YR 4/2) clay; few, fine, distinct, strong-brown (7.5YR 5/6) mottles; moderate, medium, subangular blocky structure; firm; grayish-brown ped surfaces; few, fine, brown concretions; very strongly acid; clear, smooth boundary.

AB—9 to 15 inches, dark-brown (7.5YR 4/2) clay; common, medium, faint, dark-brown (7.5YR 4/4) and strong-brown (7.5YR 5/6) mottles; moderate, medium, subangular blocky structure; some gray material in root channels; few, soft, fine, brown concretions; firm; strongly acid; clear, wavy boundary.

B21—15 to 25 inches, reddish-brown (5YR 4/4) clay; common, fine, distinct, gray (5YR 5/1) mottles; moderate, medium, angular blocky structure; very firm; wormholes filled with gray clay; many slickensides; few, fine, soft, black concretions; medium acid; clear, wavy boundary.

B22—25 to 30 inches, dark reddish-brown (5YR 3/4) clay; moderate, fine, angular blocky structure; very firm; many, fine, hard, black concretions; many slickensides; slightly acid; clear, wavy boundary.

C1—30 to 38 inches, reddish-brown (5YR 4/3) clay; moderate, fine, angular blocky structure; very firm; many slickensides; many medium calcium carbonate concretions; moderately alkaline; calcareous; abrupt, wavy boundary.

C2—38 to 47 inches, reddish-brown (5YR 4/4) and dark reddish-brown (2.5YR 3/4) clay; few dark-brown (7.5YR 3/2) stains on a few peds; moderate, fine, angular blocky structure; very firm; pockets of dark-brown silty clay loam; many slickensides; few calcium carbonate concretions; moderately alkaline; calcareous.

The A horizon ranges from very dark grayish brown to brown and is 5 to 15 inches thick. It is silt loam, silty clay loam, or clay. The B horizon ranges from dark brown to reddish brown and is mottled with gray or grayish brown. Texture is clay or silty clay to a depth of 36 inches or more and below this depth ranges from clay to silt loam and silty clay loam. This soil is medium acid to very strongly acid in the upper 20 inches, and it ranges to moderately alkaline within a depth of 40 inches.

The Portland soils are associated with Perry, Rilla, and Hebert soils. They have a finer textured B horizon than Rilla and Hebert soils and are better drained than Perry soils.

Portland silt loam (Po).—This is a level, somewhat poorly drained soil that has a clayey subsoil. It is on the bottom land in long, moderately wide areas at intermediate elevations in the eastern half of the parish.

The surface layer is brown silt loam about 8 inches thick. The subsoil is reddish-brown silty clay or clay about 24 inches thick. The underlying layers are reddish-brown to brown clay, silty clay loam, or silt loam.

Included with this soil in mapping are small areas of soils that have a silty clay loam surface layer. These included areas are at the lower elevations.

This soil is moderately low in natural fertility. It is medium acid to very strongly acid in the upper 20 inches and ranges to moderately alkaline below. In places calcium carbonate concretions are below a depth of 30 inches. Permeability is very slow, and surface runoff is slow. The available water capacity is moderate. Wetness makes the soil difficult to cultivate early in spring. Good tilth is fairly easy to maintain. Drainage is needed to remove excess surface water if cultivated crops or pasture plants are grown.

Practically all the acreage is used for cultivated crops and pasture. This soil is suited to soybeans and most pasture plants and is fairly well suited to most cultivated crops. Capability unit IIIw–2; woodland group 2w6.

Portland clay (Pr).—This is a level, somewhat poorly drained, clayey soil. It occurs mostly on broad areas in the bottom land in the eastern half of the parish.

This soil has the profile described as representative for the series. The surface layer is dark-brown clay. The subsoil is reddish-brown clay mottled with gray.

Included with this soil in mapping are small areas of soils that have a reddish-brown alkaline clayey surface layer and also a few small areas of Perry soils.

This Portland soil is moderately low in natural fer-

tility. It is medium acid to very strongly acid in the upper 20 inches and ranges to moderately alkaline within a depth of 40 inches. In places calcium carbonate concretions are present below a depth of 30 inches. Permeability is very slow, and surface runoff is slow. The available water capacity is moderate. The soil is generally wet in winter and spring, and some areas are subject to occasional flooding. It becomes cloddy when worked, and seedbed preparation is difficult. Deep cracks develop when the soil is dry. Good tilth is difficult to maintain. Texture and wetness are limitations to use. Drainage is needed if cultivated crops and pasture plants are grown.

About half the acreage is in hardwoods. The rest is used for pasture and cultivated crops. This soil is well suited to rice and fairly well suited to soybeans and other commonly grown cultivated crops and pasture plants. Capability unit IIIw–1; woodland group 2w6.

Providence Series

The soils of the Providence series are moderately well drained, are loamy throughout, and have a brittle fragipan in the lower part of the subsoil. They are nearly level to gently sloping soils, mostly in broad areas adjacent to natural drainageways in the eastern half of the parish.

In a representative profile, the surface layer is 10 inches thick and is mostly yellowish-brown silt loam. The subsoil is silt loam 15 inches thick. It is strong brown in the upper part and yellowish brown in the lower part. Below this is yellowish-brown compact silt loam mottled with gray.

Representative profile of Providence silt loam in a pine and hardwood forest 2.4 miles east of Fairbanks, 230 feet west of a powerline, in the southeast part of sec. 23, T. 19 N., R. 4 E.:

A11—0 to 1 inch, very dark grayish-brown (10YR 3/2) silt loam; strong, fine, granular structure; friable; medium acid; clear, smooth boundary.

A12—1 to 3 inches, dark grayish-brown (10YR 4/2) silt loam; strong, fine, granular structure; friable; many wormholes; strongly acid; clear, smooth boundary.

A2—3 to 6 inches, yellowish-brown (10YR 5/4) silt loam; weak, medium, subangular blocky structure; friable; wormholes filled with dark grayish-brown silt loam; very strongly acid; clear, smooth boundary.

A3—6 to 10 inches, yellowish-brown (10YR 5/4) silt loam; few, medium, distinct, strong-brown (7.5YR 5/6) mottles; weak, medium, subangular blocky structure; friable; very strongly acid; clear, wavy boundary.

B21t—10 to 19 inches, strong-brown (7.5YR 5/6) silt loam; moderate, medium, subangular blocky structure; friable; common patchy clay films; few, thin, yellowish-brown silt coatings on peds; few, fine, black and brown concretions; few pores; very strongly acid; clear, smooth boundary.

B22t—19 to 25 inches, yellowish-brown (10YR 5/6) silt loam; common, medium, distinct, strong-brown (7.5YR 5/6) mottles and few, fine, prominent, yellowish-red (5YR 4/8) mottles; moderate, medium, subangular blocky structure; friable; many discontinuous clay films; few peds have red brittle interiors; light yellowish-brown thin silt coatings; very strongly acid; clear, smooth boundary.

Bx1&A'2—25 to 34 inches, yellowish-brown (10YR 5/6) silt loam; common, medium, faint, light yellowish-brown (10YR 6/4), light brownish-gray (10YR 6/2), and yellowish-red (5YR 4/6) mottles; weak, coarse, prismatic structure that breaks into weak, medium, subangular blocky structure; firm and brittle; few black and brown concretions; continuous reddish-brown and brown clay films; 15 percent of horizon is light-gray silt loam in many cracks between polygons; cracks 2 to 22 millimeters wide and polygons 1 to 4 inches in diameter; very strongly acid; gradual, smooth boundary.

Bx2&A'2—34 to 49 inches, yellowish-brown (10YR 5/6) silt loam; common, fine, faint, light brownish-gray (10YR 6/2) and brown (10YR 5/3) mottles; weak, coarse, prismatic structure; firm and brittle; 25 percent of horizon is light brownish-gray silt loam in cracks between polygons 1 to 4 inches in diameter; few, fine, black concretions; thick continuous clay films outside prisms; very strongly acid; gradual, smooth boundary.

Bx3—49 to 54 inches, yellowish-brown (10YR 5/6) heavy silt loam; common, medium, faint, light brownish-gray (10YR 6/2) mottles and common, fine, faint, yellowish-brown (10YR 5/8) mottles; weak, coarse, prismatic structure; firm and brittle; thick gray silt coatings on peds; common, fine, black concretions; common thin clay films on peds and in pores; white silt loam in cracks; very strongly acid.

The A horizon ranges from very dark grayish-brown to light yellowish brown and is 4 to 12 inches thick. The B2t horizons are brown to yellowish red and are loam, silt loam, or silty clay loam. Thickness ranges from 10 to 22 inches. The Bx horizons are dominantly yellowish-brown silt loam or silty clay loam mottled with gray. Texture ranges to loam and clay loam. These horizons are firm and brittle. The Bx horizons commonly have enough sand to give them a gritty feel. Reaction is medium to very strongly acid.

The Providence soils are associated with Frizzell, Savannah, and Ora soils. They are better drained than Frizzell soils and are not so sandy as Savannah and Ora soils.

Providence silt loam, 1 to 3 percent slopes (PvB).—This is a nearly level, moderately well drained, loamy soil on terraces. It is in fairly large areas along the west side of the Ouachita River.

The surface layer is brown silt loam about 7 inches thick. The subsoil is strong-brown to yellowish-red silty clay loam. Below this is a yellowish-brown and gray silt loam fragipan that is firm and brittle.

Included with this soil in mapping are small areas of Frizzell and Guyton soils.

This Providence soil is moderately low in natural fertility. It is strongly acid to very strongly acid. Permeability is slow and runoff is medium. The available water capacity is high. The soil is easily cultivated. Good tilth is easily maintained. Erosion is a slight hazard where this soil is not covered with vegetation.

About 75 percent of the acreage is in pine forest. There are a few hardwoods. Most of the rest is used for pasture, homesites, and truck crops. Most crops commonly grown are well suited. Capability unit IIe–2; woodland group 2o7.

Providence silt loam, 3 to 6 percent slopes (PvC).—This is a gently sloping, moderately well drained, loamy soil on terraces in the eastern two-thirds of the parish.

This soil has the profile described as representative for the series. The surface layer is yellowish-brown silt loam about 10 inches thick. The subsoil is yellowish-red to strong-brown silt loam. It is underlain by a yellowish-brown and gray, compact and brittle silt loam fragipan at a depth of 25 inches.

Included with this soil in mapping are small areas where slopes are less than 3 percent and small areas where slopes are 6 to 8 percent.

This soil is moderately low in natural fertility. It is strongly acid to very strongly acid. Permeability is slow, and surface runoff is medium to rapid. The available water capacity is high. The soil is easily cultivated, and

good tilth is fairly easy to maintain. Erosion is a moderate hazard where cultivated crops are grown.

Most of the acreage is in pine forest. There are a few hardwoods. A small area is used for pasture. Most locally grown crops are suited. Erosion is a major hazard if this soil is clean tilled. Capability unit IIIe–1; woodland group 2o7.

Rilla Series [3]

The soils of the Rilla series are well drained and loamy throughout. They occur on natural levees of the Ouachita River, Bayou De Siard, and other streams in the eastern half of the parish.

In a representative profile, the surface layer is brown silt loam 8 inches thick. The subsoil is mainly reddish-brown silty clay loam, but is loam between depths of 35 and 49 inches.

Representative profile of Rilla silt loam in a pasture 1 mile south of junction of State Highway 15 and State Highway 841 on the west side of Youngs Bayou, in the northeast part of sec. 27, T. 17 N., R. 4 E.:

Ap—0 to 5 inches, brown (10YR 4/3) silt loam; massive to weak, fine, subangular blocky structure; friable; slightly acid; abrupt, smooth boundary.

A2—5 to 8 inches, brown (10YR 5/3) silt loam; many, fine, faint, dark yellowish-brown (10YR 4/4) mottles; weak, fine, subangular blocky structure to nearly massive; friable; slightly acid; abrupt, wavy boundary.

B21t—8 to 14 inches, reddish-brown (5YR 5/4) silty clay loam; light-brown (7.5YR 6/4) silt coatings on all ped faces; moderate, medium and coarse, subangular blocky structure; firm; thin discontinuous clay films on major ped surfaces; very strongly acid; few, fine, black concretions; gradual, smooth boundary.

B22t—14 to 21 inches, reddish-brown (5YR 4/4) silty clay loam; light-brown (7.5YR 6/4) silt coatings on major ped faces; moderate, medium and coarse, subangular blocky structure; firm; thin continuous clay films on major ped surfaces; very strongly acid; few, fine, black concretions; clear, smooth boundary.

B31t—21 to 35 inches, reddish-brown (5YR 4/4) light silty clay loam; few, medium, distinct, yellowish-red (5YR 5/8) mottles and a few, medium-sized, pale-brown silt pockets and streaks; weak to moderate, coarse, subangular blocky structure; firm; thin patchy clay films on major ped surfaces; very strongly acid; few, fine, black concretions; clear, smooth boundary.

B32—35 to 49 inches, reddish-brown (5YR 4/4) loam; common, pale-brown (10YR 6/3) silt pockets and many silt streaks; massive; firm; few thin patchy clay films; very strongly acid; few, fine, soft, brown and black concretions; few fine pores; clear, smooth boundary.

C1—49 to 63 inches, brown (7.5YR 4/4) light silty clay loam; few light brownish-gray (10YR 6/2) silt pockets up to one-half inch thick and many silt streaks in a reticulate pattern; massive; firm; medium acid; few black streaks; few, soft, brown and black concretions; clear, smooth boundary.

C2—63 to 69 inches, brown (7.5YR 4/4) loam; light brownish-gray (10YR 6/2) silt pockets and streaks; massive; firm; neutral; few black streaks and brown spots.

The A horizon ranges from dark brown to grayish brown and is 5 to 18 inches thick. The B horizon is mostly reddish brown, but it ranges to brown and dark brown. Texture is dominantly silty clay loam but it ranges to loam and silt loam. Thickness ranges from 30 to 45 inches. The reaction ranges from slightly acid to medium acid in the A horizon and from medium acid to very strongly acid inthe B horizon.

The Rilla soils are associated with Sterlington, Gallion, and Hebert soils. They are finer textured in the B horizon than Sterlington soils, more acid in the B horizon than Gallion soils, and better drained than Hebert soils.

Rilla silt loam, 0 to 1 percent slopes (RlA).—This is a level, well-drained, loamy soil. It occurs on broad, smooth natural levees of the Ouachita River, Bayou De Siard, and other streams in the eastern half of the parish. Areas west of the Ouachita River that are unprotected by levees are subject to occasional flooding.

This soil has the profile described as representative for the series. The surface layer is brown silt loam. The subsoil is reddish-brown silty clay loam.

Included with this soil in mapping are small areas of Hebert and Gallion soils.

This Rilla soil is medium in natural fertility. It is slightly acid in the surface layer and very strongly acid in the subsoil. Permeability is moderately slow, and surface runoff is medium. The available water capacity is high. The soil is easy to cultivate, and good tilth is easily maintained.

Most of the acreage is used for cultivated crops. A small acreage is used for pasture and building sites. Most locally grown cultivated crops and pasture plants are well suited. Capability unit I–1; woodland group 2o4.

Rilla silt loam, 1 to 3 percent slopes (RlB).—This is a nearly level, well-drained, loamy soil. It occurs on broad natural levees of the Ouachita River, Bayou De Siard, and other streams in the eastern half of the parish.

The surface layer is brown silt loam about 5 inches thick. The subsoil is reddish-brown silty clay loam.

Included with this soil in mapping are small areas of Hebert and Sterlington soils.

This Rilla soil is medium in natural fertility. It is strongly acid to very strongly acid. Permeability is moderately slow, and surface runoff is medium. The available water capacity is high. This soil can be cultivated throughout a wide range of moisture content. Good tilth is easily maintained.

Nearly all the acreage is used for cultivated crops. Small areas are used for pasture. This soil is well suited to most locally grown cultivated crops and pasture plants. Capability unit IIe–1; woodland group 2o4.

Rilla-Hebert complex, gently undulating (RmB).—This mapping unit is about 60 percent Rilla soils and 40 percent Hebert soils. These are loamy soils on ridges and in swales. They occur on natural levees of streams in the eastern half of the parish.

The well-drained Rilla soils are on ridges. They have a surface layer of brown silt loam. The subsoil is reddish-brown silty clay loam. Slopes are generally 0 to 3 percent but in a few places range to 5 percent.

The somewhat poorly drained Hebert soils are in swales. They have a surface layer of grayish-brown silt loam or silty clay loam. The subsoil is reddish-brown silty clay loam mottled with gray. Hebert soils are level to depressional.

The natural fertility of these soils is medium. Permeability is moderately slow. Runoff is medium on the ridges and slow in the swales. The available water capacity is high. The ridges can be worked throughout a fairly wide range of moisture content. Wetness in the swales and the short irregular slopes (fig. 5) make these soils somewhat difficult to work. Drainage is needed in the swales if cultivated crops or pasture plants are grown.

[3] This series includes soils that were formerly called Gallion soils in this parish.

Figure 5.—**Uneven soil surface in an area of Rilla-Hebert complex.**

About 95 percent of the acreage is used for cultivated crops and pasture. The mapping unit is suited to most cultivated crops and pasture plants commonly grown in the area. Capability unit IIw–3; woodland group 2o4 for Rilla soil and 2w5 for Hebert soil.

Rosebloom Series

The soils of the Rosebloom series are poorly drained and loamy throughout. They occur on flood plains of local streams and on the unprotected side of the Ouachita River levee system.

In a representative profile, the surface layer is dark grayish-brown silt loam 8 inches thick. The subsoil is gray silt loam and silty clay loam that has brownish mottles and extends to a depth of 60 inches.

Representative profile of Rosebloom silt loam in woodland on the Cypress Creek flood plain, 354 feet east of State Highway 557, in the northwest part of sec. 14, T. 15 N., R. 2 E.:

A11—0 to 3 inches, dark grayish-brown (10YR 4/2) silt loam; few, fine, faint, gray (10YR 6/1) mottles; weak, medium, subangular blocky structure; friable; strongly acid; abrupt, smooth boundary.

A12—3 to 8 inches, dark grayish-brown (10YR 4/2) silt loam; many, fine, faint, gray (10YR 6/1) and dark-brown (10YR 4/3) mottles; weak, medium, subangular blocky structure; friable; few, soft, black concretions; few pores; very strongly acid; clear, wavy boundary.

B21g—8 to 12 inches, gray (10YR 6/1) silt loam; common, medium, faint, dark yellowish-brown (10YR 4/4) mottles; weak, medium and fine, subangular blocky structure; friable; few, fine, brown concretions that have yellowish-brown interiors; common pores; very strongly acid; clear, wavy boundary.

B22g—12 to 21 inches, gray (10YR 6/1) silt loam; common, medium, distinct, strong-brown (7.5YR 5/6) and yellowish-brown (10YR 5/4) mottles; weak, coarse, subangular blocky structure; friable; many pores; few, fine, brown and black concretions; very strongly acid; clear, smooth boundary.

B23g—21 to 36 inches, gray (10YR 6/1) light silty clay loam; common, medium and coarse, distinct, strong-brown (7.5YR 5/6) and yellowish-brown (10YR 5/6) mottles; weak, coarse, subangular blocky structure; firm; few, soft, brown concretions; many pores; few clay films in root channels; very strongly acid; gradual, smooth boundary.

B3g—36 to 60 inches, gray (10YR 6/1) silty clay loam; many, medium and coarse, distinct, strong-brown (7.5YR 5/6) and yellowish-brown (10YR 5/6) mottles; weak, coarse,

subangular blocky structure; firm; common pores; few, fine, yellowish-brown concretions; pores stained with yellowish brown; very strongly acid.

The A horizon is dark grayish brown to brown. The B horizon ranges from gray to light brownish gray mottled with light gray, brown, and yellow. The dominant texture is silt loam and silty clay loam and ranges to loam and very fine sandy loam in the lower part. The reaction is medium acid to very strongly acid.

The Rosebloom soils are associated with Guyton and Barclay soils. They are more poorly drained than Barclay soils and lack the strong profile development of Guyton soils.

In this parish Rosebloom soils are mapped only in complexes with Guyton and Barclay soils. These complexes are described following the series descriptions of Guyton and Barclay soils.

Ruston Series

The soils of the Ruston series are well drained and loamy throughout. They are nearly level to steep soils in the western part of the parish.

In a representative profile, the surface layer is brown fine sandy loam 14 inches thick. The subsoil is red mainly sandy clay loam to a depth of several feet.

Representative profile of Ruston fine sandy loam in pine woodland about 2 miles southwest of Cadeville, in the southeast corner of sec. 34, T. 17 N., R. 1 E.:

A1—0 to 1 inch, dark grayish-brown (10YR 4/2) fine sandy loam; weak, fine, granular structure; friable; many charcoal fragments; medium acid; abrupt, wavy boundary.

A21—1 to 6 inches, brown (10YR 5/3) fine sandy loam; few, medium, faint, yellowish-brown (10YR 5/4) mottles; weak, fine, subangular blocky structure; few fine bits of charcoal; medium acid; clear, smooth boundary.

A22—6 to 14 inches, brown (7.5YR 5/4) fine sandy loam; common, medium, distinct, yellowish-red (5YR 5/6) mottles; weak, medium, subangular blocky structure; very friable; common fine and medium pores; strongly acid; clear, wavy boundary.

B&A—14 to 19 inches, red (2.5YR 4/6) loam; 20 percent pockets of brown (7.5YR 5/4) fine sandy loam (A2); weak, medium, subangular blocky structure; friable; few, fine, brown concretions; strongly acid; clear, wavy boundary.

B21t—19 to 26 inches, red (2.5YR 4/6) sandy clay loam; weak, medium, subangular blocky structure; friable; discontinuous distinct clay films on ped faces; sand grains coated and bridged with clay; strongly acid; gradual, wavy boundary.

B22t—26 to 42 inches, red (2.5YR 4/6) sandy clay loam; weak, coarse, subangular blocky structure; friable; patchy distinct clay films on ped surfaces; sand grains coated and bridged with clay; strongly acid; clear, smooth boundary.

A'2—42 to 53 inches, red (2.5YR 4/6) loam; few, medium, reddish-brown (2.5YR 4/4) pockets; massive; friable, very slightly brittle; strongly acid; clear, smooth boundary.

B'2t—53 to 73 inches, red (2.5YR 4/6) sandy clay loam; weak, medium and coarse, subangular blocky structure; friable; discontinuous distinct clay films on ped surfaces; sand grains coated and bridged with clay; strongly acid; clear, smooth boundary.

A'2—73 to 81 inches, red (2.5YR 5/6) fine sandy loam; massive; friable; discontinuous pockets of brownish-yellow fine sandy loam; strongly acid; clear, discontinuous boundary.

B'2t—81 to 90 inches, red (2.5YR 4/6) sandy clay loam; weak, medium, subangular blocky structure; friable; discontinuous distinct clay films; sand grains coated and bridged with clay; strongly acid.

The A horizon ranges from very dark grayish brown to light yellowish brown and from fine sandy loam to sandy loam. Thickness is 4 to 20 inches. The very dark grayish-brown part is less than 6 inches thick. The B horizon is red to yellowish red and ranges from sandy clay loam to loam and clay loam. The A horizon is medium acid to very strongly acid, and the B horizon is strongly acid to very strongly acid.

Ruston soils are associated with Kirvin, Lucy, and Alaga soils. They are finer textured throughout than Alaga soils, are coarser textured in the B horizon than Kirvin soils, and lack the thick sandy surface layer of Lucy soils.

Ruston fine sandy loam, 1 to 3 percent slopes (RsB).—This is a nearly level, well-drained loamy soil on ridgetops in the western half of the parish.

The surface layer is brown fine sandy loam about 6 inches thick. The subsoil is red or yellowish-red sandy clay loam.

Included with this soil in mapping are small areas of Savannah and Providence soils.

This Ruston soil has low natural fertility, but crops on it respond well to fertilizers. It is medium acid to very strongly acid. Permeability is moderate, and surface runoff is medium. The available water capacity is moderate. Good tilth is easy to maintain, and the soil can be cultivated throughout a wide range of moisture content. Erosion is a slight hazard where the soil is without a vegetative cover.

Practically all the acreage was used for cultivated crops, but now about half of it is used for pasture and residential development. The rest is in pine trees. Most locally grown crops and pasture plants are suited (fig. 6). Capability unit IIe–2; woodland group 2o1.

Ruston fine sandy loam, 3 to 8 percent slopes (RsD).—This is a well-drained, loamy, gently sloping to moderately sloping soil on uplands. It is in small areas near the center of the parish, west of the Ouachita River.

The surface layer is brown fine sandy loam about 6 inches thick. The subsoil is red to yellowish-red sandy clay loam.

Included with this soil in mapping are small areas that are severely eroded and small areas of Ora and Savannah soils.

Natural fertility is low, but crops respond well to fertilizers. This Ruston soil is medium acid to very strongly acid. Permeability is moderate, and surface runoff is medium. The available water capacity is moderate. Good tilth is easily maintained. Erosion is a moderate hazard where the soil is without a vegetative cover. The slopes make the use of multirow equipment difficult.

Most of the acreage is in pine forest. Most locally grown cultivated crops and pasture plants are suited. Capability unit IIIe–1; woodland group 2o1.

Ruston fine sandy loam, 8 to 12 percent slopes (RsE).—This is a well-drained, loamy, sloping soil on uplands in the western part of the parish. It occurs in large areas.

The surface layer is brown fine sandy loam. It is about 5 inches thick on the upper slopes and ranges to 20 inches thick on the lower slopes. The subsoil is red or yellowish-red sandy clay loam.

Included with this soil in mapping are small areas that are severely eroded and small areas of Kirvin soils.

This Ruston soil has low natural fertility, but crops respond well to fertilizers. It is medium acid to very strongly acid. Permeability is moderate, and surface runoff is rapid. The available water capacity is moderate.

Figure 6.—**Coastal bermudagrass on Ruston fine sandy loam, 1 to 3 percent slopes. Farm pond in background.**

Good tilth is fairly easy to maintain. Erosion is a severe hazard where the soil is without a vegetative cover.

Most of the acreage is in pine trees. A small acreage is used for pasture. Most locally grown crops and pasture plants are suited, but the steep slopes and erosion hazard limit use. Capability unit IVe–1; woodland group 2o1.

Ruston-Lucy association, undulating (Ru).—This mapping unit is about 60 percent Ruston soils, 12 percent Lucy soils, 8 percent Savannah soils, and 8 percent Ora soils. These are well-drained soils on uplands. They are on wide, smooth ridgetops in the northwestern part of the parish. The composition of this unit is more variable than that of most other units in the parish, but composition has been estimated well enough for interpreting the expected use of the soils.

Ruston soils have a surface layer of brown fine sandy loam about 10 inches thick and a yellowish-red or red sandy clay loam subsoil. These soils are well drained, moderately permeable, low in natural fertility, and moderate in available water capacity. They are medium acid to very strongly acid. Slopes range from 1 to 8 percent.

Lucy soils are on the ridgetops and gentle side slopes. These soils have a surface layer of yellowish-brown loamy fine sand 20 to 40 inches thick and a red sandy loam subsoil. Lucy soils are well drained. They are rapidly permeable in the surface layer and moderately permeable in the subsoil, low in natural fertility, and moderately low in available water capacity. They are medium acid to very strongly acid. Slopes range from 3 to 9 percent and average 7 percent.

The Savannah soils are on the ridge crests and border shallow drainageways. These soils have a surface layer of yellowish-brown fine sandy loam about 8 inches thick. The subsoil is brown to yellowish-brown sandy clay loam underlain by a gray and brown mottled fragipan at a depth of 18 to 30 inches. Savannah soils are moderately well drained, slowly permeable, and low in natural fertility. The available water capacity is moderate. These

soils are medium acid to very strongly acid. Slopes average 3 percent.

Ora soils are on the crests and upper slopes. They are moderately well drained, moderately permeable, low in natural fertility, and moderate in available water capacity. Ora soils are medium acid to very strongly acid. Slopes range from 3 to 8 percent.

Included with these soils in mapping are areas of Kirvin and Providence soils and of wet soils in narrow drainageways.

About 75 percent of the acreage is in pine forest. There are a few hardwoods. About 20 percent is used for crops and pasture (fig. 7). The remaining acreage has been developed for residential use.

These soils are well suited to pine trees and to cultivated crops and pasture. They have few limitations for residential use. The Lucy soils are somewhat droughty, and late in summer and in fall the available moisture is occasionally inadequate for cultivated crops and pasture plants. Capability unit IIe–2 for Ruston soil 1 to 3 percent slopes; IIIe–1 for Ruston soil 3 to 8 percent slopes, Ora soil 5 to 8 percent slopes, and Savannah soil 1 to 5 percent slopes; and IVs–1 for Lucy soil 5 to 8 percent slopes. Woodland group 2o1 for Ruston soil, 3s2 for Lucy soil, and 3o7 for Ora and Savannah soils.

Ruston-Lucy association, hilly (Ry).—This mapping unit is about 41 percent Ruston soils, 20 percent Lucy soils, 11 percent Alaga soils, and 8 percent Ora soils. These are well-drained soils on uplands in the western and southwestern parts of the parish. They occur on nar-

Figure 7.—**Bahiagrass on Ruston-Lucy association, undulating.**

row ridgetops and long slopes. The composition of this unit is more variable than that of the other units in the parish but has been controlled well enough for interpreting the expected use of the soils.

Ruston soils have a surface layer of brown fine sandy loam or sandy loam about 14 inches thick and a subsoil of red to yellowish-red sandy clay loam. These soils are well drained, moderately permeable, low in natural fertility, and moderate in available water capacity. They are medium acid to very strongly acid. Slopes range from 5 percent on the narrow ridgetops to 30 percent on the long slopes. The average slope is 13 percent.

Lucy soils are dominantly on the middle and lower slopes. These soils have a surface layer of yellowish-brown loamy fine sand about 28 inches thick. The subsoil is yellowish-red to red sandy loam. Lucy soils are well drained, rapidly permeable through the surface layer and moderately permeable in the subsoil, low in natural fertility, and moderately low in available water capacity. They are medium acid to very strongly acid. Slopes range from 8 to 25 percent and average 15 percent.

Alaga soils are on the lower slopes. They have a surface layer of yellowish-brown loamy fine sand 10 to 30 inches thick. The subsoil is brown to yellowish-red loamy fine sand. Alaga soils are excessively drained, rapidly permeable, low in natural fertility, and low in available water capacity. They are strongly acid. Slopes range from 8 to 20 percent but average 12 percent.

Ora soils also occur on slopes. They have a surface layer of yellowish-brown fine sandy loam about 10 inches thick and a subsoil of yellowish-red to yellowish-brown sandy clay loam. Ora soils are moderately well drained, moderately permeable, low in natural fertility, and moderate in available water capacity. They are medium acid to very strongly acid. Slopes range from 5 to 12 percent but average 8 percent.

Included with these soils in mapping are areas of wet soils in the narrow drainageways and areas of Kirvin soils on slopes.

About 92 percent of the acreage is in pine forest. There are a few hardwoods. About 6 percent of the acreage is used for truck crops and pasture. A small acreage has been developed for residential use.

These soils are well suited to pine trees. On the smooth ridgetops, the soils that have slopes of less than 8 percent have few limitations to use for pasture, row crops, and residential development. Slope is a major limitation on the steeper slopes. The Lucy and Alaga soils are somewhat droughty, and in summer and fall the available moisture is occasionally inadequate for cultivated crops and pasture plants. The wet soils in the drainageways are suited to pasture and to pine and hardwood trees. Capability unit IIIe–1 for Ruston soil 5 to 8 percent slopes; IVe–1 for Ruston and Ora soils 8 to 12 percent slopes; VIe–1 for Ruston soil 12 to 30 percent slopes; and VIe–3 for Lucy and Alaga soils 8 to 25 percent slopes. Woodland group 2o1 for Ruston soil, 3s2 for Lucy soil, 3s3 for Alaga soil, and 3o7 for Ora soil.

Savannah Series

The soils of the Savannah series are moderately well drained and loamy throughout. They have a brittle fragipan in the lower part of the subsoil. These nearly level to gently sloping soils are in the western half of the parish.

In a representative profile, the surface layer is mainly dark grayish-brown fine sandy loam 9 inches thick. The subsoil is strong-brown loam. It is underlain by a gray and brown fragipan at a depth of 22 inches.

Representative profile of Savannah fine sandy loam, 1 to 5 percent slopes, in a cultivated field near the northeast corner of the North Louisiana Experiment Station at Calhoun, in the northwestern part of SE¼NW¼ sec. 26, T. 18 N., R. 1 E.:

Ap1—0 to 3 inches, dark-brown (10YR 4/3) fine sandy loam; weak, medium, subangular blocky structure; friable; many wormholes; medium acid; abrupt, smooth boundary.

Ap2—3 to 9 inches, dark grayish-brown (10YR 4/2) fine sandy loam; 25 percent dark-brown (10YR 4/3) fine sandy loam as pockets and thin layers; weak, medium, subangular blocky structure; friable; many worm casts; medium acid; abrupt, smooth boundary.

B1t—9 to 16 inches, strong-brown (7.5YR 5/6) loam; weak, medium, subangular blocky structure; friable; thin pale-brown ped coatings; few, thin, incomplete clay films, mostly in pores; few, fine, soft, black concretions; medium acid; clear, smooth boundary.

B2t—16 to 22 inches, strong-brown (7.5YR 5/6) loam; weak, medium, subangular blocky structure; friable; thin pale-brown ped coatings; few patchy clay films in pores and on peds; 3 percent is medium brown concretions that have black interiors; very strongly acid; clear, wavy boundary.

Bx1—22 to 30 inches, brown (10YR 5/3) and gray (10YR 5/1) loam; moderate, coarse, subangular blocky structure that breaks into blocks 1 to 4 inches across; blocks have yellowish-brown to strong-brown rinds; firm; brittle; vertical cracks one-half inch wide lined with gray and filled with light yellowish-brown sandy loam; cracks extend through horizons below; few thin clay films outside peds; common fine pores; 5 percent is fine and medium, black and brown concretions; very strongly acid; clear, smooth boundary.

Bx2—30 to 48 inches, about 60 percent light brownish-gray (10YR 6/2) fine sandy loam surrounding polygonal blocks 1 to 3 inches across; strong-brown (7.5YR 5/6) loam variegated with soft, black, manganese concretionary material inside blocks; weak, coarse, subangular blocky structure; firm and brittle; thin patchy clay films; many pores; few roots in cracks; very strongly acid; clear, smooth boundary.

Bx3—48 to 62 inches, strong-brown (7.5YR 5/6) sandy clay loam; common, medium, distinct, yellowish-brown (10YR 5/4) mottles; about 50 percent of the horizon gray (10YR 6/1) sandy clay loam that completely surrounds brown peds; weak, coarse, prismatic structure breaking to weak, medium, subangular blocky structure; friable, slightly brittle; cracks ½ to 1 inch wide filled with gray loamy fine sand; very strongly acid.

The A horizon ranges from dark grayish brown to yellowish brown and is 5 to 10 inches thick. The Bt horizons are yellowish-brown to strong-brown loam, clay loam, or sandy clay loam 10 to 20 inches thick. Depth to the fragipan ranges from 18 to 40 inches. The Bx horizons are mottled with shades of gray and brown. Texture ranges from fine sandy loam to sandy clay loam. The A horizon is medium acid, and the B horizon is medium acid to very strongly acid.

The Savannah soils are associated with the Ora, Providence, Ruston, and Waller soils. They are better drained than Waller soils, are more poorly drained than Ruston and Ora soils, and have a higher sand content than Providence soils. Savannah soils have a fragipan, but Ruston and Waller soils do not.

Most of the acreage of Savannah soils is mapped in association with other soils. Descriptions of these associations follow the series descriptions of Ruston and Ora soils.

Savannah fine sandy loam, 1 to 5 percent slopes (SaC).—This is a moderately well drained, loamy, nearly level to gently sloping soil on terraces. It occurs in small areas along the west side of the Ouachita River.

The surface layer is dark-brown to grayish-brown fine sandy loam about 8 inches thick. The subsoil consists of yellowish-brown to strong-brown loam about 10 inches thick. It is underlain by a brown and gray fragipan that is firm and brittle.

Included with this soil in mapping are small areas of Providence and Frizzell soils.

This Savannah soil is low in natural fertility. It is medium acid to very strongly acid. The available water capacity is moderate. Permeability is slow, and surface runoff is medium. This soil is easily worked throughout a wide range of moisture content. Good tilth is easily maintained. Erosion is a slight hazard where this soil is clean cultivated.

About 60 percent of the acreage is in pine forest. There are a few hardwoods. About 30 percent is used for pasture, and the rest is used for community development. Most locally grown cultivated crops and pasture plants are suited. Capability unit IIIe–1; woodland group 3o7.

Sterlington Series [4]

The soils of the Sterlington series are well drained and loamy throughout. They occur on natural levees of the Ouachita River, Bayou De Siard, and other streams in the eastern half of the parish.

In a representative profile, the surface layer is dark grayish-brown silt loam 7 inches thick. The subsurface layer is brown silt loam 5 inches thick. The subsoil is reddish-brown silt loam in the upper 11 inches, dark-brown very fine sandy loam in the next 13 inches, and yellowish-red silt loam in the lower 16 inches.

Representative profile of Sterlington silt loam in a cultivated field 4.3 miles southeast of Sterlington on U.S. Highway No. 165, 900 feet southwest of church, in the southwest part of sec. 41, T. 19 N., R. 4 E.:

Ap—0 to 7 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; very friable; very strongly acid; abrupt, wavy boundary.

A2—7 to 12 inches, brown (10YR 5/3) silt loam; few, fine, dark-brown spots and stains; massive to weak, medium, subangular blocky structure; very friable; strongly acid; abrupt, wavy boundary.

B2t—12 to 23 inches, reddish-brown (5YR 4/4) silt loam; common, medium, distinct, brown (7.5YR 5/4) mottles; weak, medium, subangular blocky structure; friable; patchy thin clay films on ped surfaces and in pores; very strongly acid; clear, irregular boundary.

B&A—23 to 36 inches, dark-brown (7.5YR 4/4) very fine sandy loam; streaks and spots of brown (7.5YR 5/4) silt loam; weak, medium, subangular blocky structure; friable; few fine roots; very strongly acid; abrupt, wavy boundary.

B'2t—36 to 52 inches, yellowish-red (5YR 4/6) silt loam; few, medium, distinct, brown (7.5YR 5/4) mottles; weak, medium, subangular blocky structure; friable, slightly brittle; very strongly acid; clear, wavy boundary.

C—52 to 60 inches, reddish-brown (5YR 4/4) silt loam; common, medium, distinct, brown (7.5YR 5/4) mottles; massive; friable; very strongly acid.

The A horizon is silt loam and ranges from very dark grayish brown to light yellowish brown. The B horizon ranges from dark brown to yellowish red and from silt loam to very fine sandy loam. The A horizon ranges from very strongly acid to slightly acid, and the B horizon is very strongly acid.

The Sterlington soils are associated with Gallion, Rilla, and Hebert soils. They are slightly coarser textured than these soils, better drained than the Hebert soils, and less alkaline than Gallion soils.

Sterlington silt loam, 0 to 1 percent slopes (StA).—This is a well-drained, level, loamy soil on natural levees of the major streams in the eastern half of parish.

This soil has the profile described as representative for the series. The surface layer is dark grayish-brown silt loam 7 inches thick. The subsurface layer is brown silt loam 5 inches thick. The subsoil is dark-brown to yellowish-red silt loam.

Included with this soil in mapping are small areas of Gallion, Rilla, and Hebert soils.

This Sterlington soil has medium natural fertility. It is strongly acid to very strongly acid. Permeability is moderate, and surface runoff is slow. The available water capacity is high. This soil is easy to cultivate and needs only normal management to maintain good crop growth under continuous cropping. It is among the most desirable soils in the parish for cultivated crops (fig. 8).

All the acreage is cleared, and most is used for cultivated crops. About 15 percent is used for industrial, commercial, and residential purposes. Most all locally grown cultivated crops and pasture plants are well suited. Capability unit I–1; woodland group 2o4.

Sterlington silt loam, 1 to 3 percent slopes (StB).—This is a nearly level, well-drained, loamy soil on natural levees in the eastern part of the parish.

The surface layer is brown silt loam. The subsoil is reddish-brown silt loam or very fine sandy loam.

Included with this soil in mapping are small areas of Rilla soils and a few small areas that have 3 to 5 percent slopes.

This Sterlington soil has medium natural fertility. It is strongly acid to very strongly acid. Permeability is moderate, and surface runoff is medium, The available water capacity is high. This soil is easy to cultivate, and good tilth is easily maintained. Erosion is a slight hazard if the soil is clean tilled.

Practically all the acreage is used for cultivated crops. A small acreage is used for building sites. Nearly all locally grown cultivated crops and pasture plants are well suited. Capability unit IIe–1; woodland group 2o4.

Terrace Escarpments

Terrace escarpments (Te) consists of steep slopes on a broken landscape between the terraces and flood plains in the eastern half of the parish. The area is highly dissected by drainageways and ravines that have slopes ranging from 12 to 60 percent.

The soil material is highly variable but is dominantly sandy clay loam, silty clay loam, silt loam, and clay. Gravelly soil crops out on a few slopes. The soil material is dominantly strongly acid but ranges to neutral.

Included in mapping are small areas of Providence, Savannah, Ora, and Frizzell soils on the narrow ridgetops.

Most locally grown pasture plants and pine trees can be grown, but management is very difficult because slopes

[4] This series includes soils that were formerly called Pulaski soils in this parish.

Figure 8.—**Excellent skip-row cotton on Sterlington silt loam, 0 to 1 percent slopes. Capability unit I–1.**

are steep and irregular. Steep slopes prevent the use of this land for cultivated crops. Erosion is a major hazard in areas without a vegetative cover. Pasture, wildlife, woodland, and recreation are suitable uses. Capability unit and woodland group not assigned.

Waller Series

The soils of the Waller series are poorly drained and loamy throughout. They occur on broad flats or depressional areas mostly in and south of the city of West Monroe.

In a representative profile, the surface layer is yellowish-brown loam 3 inches thick. The subsurface layer is mainly light brownish-gray loam 21 inches thick. The subsoil is mainly gray clay loam to a depth of 80 inches.

Representative profile of Waller loam in a hardwood forest 3,800 feet west of the Ouachita River, 123 feet north of a gravel road, in the northwest part of sec. 23, T. 16 N., R. 3 E.:

A1—0 to 3 inches, yellowish-brown (10YR 5/4) loam; common, medium, faint, light brownish-gray and strong-brown mottles; weak, coarse, subangular blocky structure; friable; many, soft, brown concretions; many wormholes; medium acid; clear, smooth boundary.

A21g—3 to 10 inches, light brownish-gray (10YR 6/2) loam; many, medium, distinct, yellowish-brown (10YR 5/6), strong-brown (7.5YR 5/6), and dark yellowish-brown (10YR 4/4) mottles; weak, coarse, subangular blocky structure; friable; many roots and wormholes; very strongly acid; gradual, smooth boundary.

A22g—10 to 18 inches, light brownish-gray (10YR 6/2) loam; common, medium, distinct, yellowish-brown (10YR 5/6) and dark-brown (10YR 4/3) mottles; massive; friable; many, soft, black concretions; many roots, few pores; very strongly acid; gradual, wavy boundary.

A2g & Bg—18 to 24 inches, 80 percent light-gray (10YR 7/1) silt loam (A2) and 20 percent dark yellowish-brown (10YR 4/4) silty clay loam (Bg); common, fine, faint, yellowish-brown mottles; massive; friable; few, soft, black concretions; many roots and many pores; very strongly acid; abrupt, way boundary.

B21tg—24 to 34 inches, gray (10YR 5/1) clay loam; common, medium, distinct, yellowish-brown (10YR 5/6) mottles; moderate, medium, prismatic structure; firm; patchy light gray coatings on ped surfaces; continuous clay films; few, fine, black concretions; very strongly acid; gradual, smooth boundary.

B22tg—34 to 48 inches, light brownish-gray (2.5Y 6/2) clay loam; many, medium, distinct, yellowish-brown (10YR 5/6) and dark yellowish-brown (10YR 4/4) mottles; weak, medium, subangular blocky structure; firm; common clay films; few small animal burrows lined with dark grayish-brown clay; very strongly acid.

B3tg—48 to 80 inches, gray (10YR 5/1) clay loam; common, medium, faint, yellowish-brown (10YR 5/6) and dark-brown (7.5 YR 4/4) mottles; weak, medium, subangular blocky structure; firm; few thin clay films on peds; very strongly acid.

The A1 horizon ranges from dark grayish brown to brownish gray and yellowish brown and is 1 to 8 inches thick. The A2 horizon is gray silt loam, loam, or fine sandy loam. Total thickness of the A horizons is 10 to 30 inches. The B horizon

is gray or light brownish-gray loam, sandy clay loam, or clay loam. Reaction is medium acid to very strongly acid.

These soils are outside the defined range for the Waller series in that mineralogy is siliceous instead of mixed. They are so similar to Waller soils in morphology, composition, and behavior that a new series is not warranted.

Waller soils are associated with Guyton and Savannah soils. They have a higher sand content than Guyton soils. They are not so well drained as Savannah soils, and they do not have a fragipan.

Waller loam (Wa).—This is a poorly drained, level or depressional, loamy soil on terraces. It occurs in large areas in and south of the city of West Monroe.

The surface layer is yellowish-brown loam about 3 inches thick. The subsurface layer is light brownish-gray loam 21 inches thick. The subsoil is gray clay loam mottled with brown and yellow.

Included with this soil in mapping are small areas of Guyton and Frizzell soils and a few mounds about 3 feet high and 20 feet wide.

This Waller soil is low in natural fertility. It is medium acid to very strongly acid. Permeability is very slow, and surface runoff is slow. The available water capacity is moderate. The soil is generally wet in winter and spring, and some areas are flooded for 2 or 3 days following a heavy rainfall. It is difficult to cultivate, and good tilth is hard to maintain. Wetness is a major limitation to use. Drainage is needed for cultivated crops and pasture plants.

Most of the acreage is in pine and hardwood trees and pasture. Some areas are used for building sites. Most cultivated crops are poorly suited. Pasture plants are better suited. Capability unit IIIw–3; woodland group 2w9.

Wrightsville Series

The soils of the Wrightsville series are level and poorly drained. They have a loamy surface layer and a clayey subsoil. They occur on broad areas mostly in the southeastern part of the parish, excluding the flood plains.

In a representative profile, the surface layer is mainly light brownish-gray silt loam 16 inches thick. The subsoil is light brownish-gray clay.

Representative profile of Wrightsville silt loam in a hardwood forest 210 feet east of State Highway 841, in the southwest part of sec. 3, T. 16 N., R. 4 E.:

A1—0 to 3 inches, grayish-brown (10YR 5/2) silt loam; common, medium, distinct, strong-brown (7.5YR 5/6) mottles; weak, medium, subangular blocky structure; friable; few fragments of dark grayish-brown silt loam; very strongly acid; clear, smooth boundary.

A2g—3 to 13 inches, light brownish-gray (10YR 6/2) silt loam; common, medium, distinct, strong-brown (7.5YR 5/6) mottles; weak, medium, subangular blocky structure; friable; few crayfish casts of silty clay loam; very strongly acid; clear, irregular boundary.

A2g & Bg—13 to 16 inches, light brownish-gray (2.5Y 6/2) silt loam; common, medium, distinct, strong-brown (7.5YR 5/6) mottles; weak, medium, subangular blocky structure; 20 percent of this horizon consists of peds of light brownish-gray silty clay loam from B horizon; few parts of crayfish casts; friable; very strongly acid; clear, irregular boundary.

B21tg—16 to 29 inches, light brownish-gray (2.5Y 6/2) clay; common, medium, distinct, strong-brown (7.5YR 5/8) mottles; weak, fine, angular blocky structure; firm; few vertical streaks of gray silt loam; patchy clay films; very strongly acid; clear, smooth boundary.

B22tg—29 to 39 inches, light brownish-gray (2.5Y 6/2) clay; few, fine, faint, yellowish-brown (10YR 5/8) mottles; moderate, fine, angular blocky structure; thin patchy clay films; firm; very strongly acid; abrupt, smooth boundary.

Cg—39 to 48 inches, light brownish-gray (2.5Y 6/2) clay; common, medium, distinct, yellowish-brown (10YR 5/8) mottles; massive; very firm; very strongly acid.

The A1 horizon ranges from dark grayish brown to gray and is 1 to 6 inches thick. Thickness of the combined A horizons ranges from 8 to 28 inches. Tongues of the A2 horizon extend into the B horizon. The B horizon is gray, light gray, or light brownish gray. It is clay or silty clay to a depth of 40 inches and ranges to silty clay loam below this depth. The A and B horizons range from strongly acid to very strongly acid.

The Wrightsville soils are associated with the Crowley, Muskogee, Alligator, and Perry soils. They are more poorly drained than Crowley and Muskogee soils, lack the red alkaline IIC horizon of Perry soils, and are more strongly developed than Perry and Alligator soils.

Wrightsville silt loam (Wr).—This is a level or depressional, poorly drained soil that has a clayey subsoil. It occurs in large areas on terraces in the southeastern part of the parish.

The surface layer is light brownish-gray or gray silt loam about 16 inches thick. The subsoil is gray or light brownish-gray clay or silty clay mottled with brown.

Included with this soil in mapping are small areas of Crowley soils and a few small areas that have a silty clay loam subsoil.

This Wrightsville soil has moderately low natural fertility. It is strongly to very strongly acid. The available water capacity is moderate. The surface of this soil tends to crust where clean tilled. Wetness is a major limitation to use. Some areas are subject to flooding for short periods after heavy rainstorms. Drainage is needed to remove excess surface water if cultivated crops or pasture plants are grown.

About half of the acreage is in hardwood trees. The remaining acreage is used for soybeans, pasture, and residential sites. Rice is well suited, and soybeans are fairly well suited. Other cultivated crops are not so well suited. Most pasture plants are fairly well suited. Capability unit IIIw–3; woodland group 3w9.

Use and Management of the Soils

This section describes the use and management of the soils in Ouachita Parish for cropland, pasture, woodland, wildlife, and engineering structures.

Use of the Soils for Crops and Pasture

In this section general principles of management are given, the system of capability grouping of soils used by the Soil Conservation Service is explained, and management by capability units is described. Also in this section is a table of estimated yields for each soil cultivated under a high level of management.

General principles of management

General principles of soil management widely applicable to Ouachita Parish are discussed in the following paragraphs. Special recommendations cannot be given, because management practices change as new information becomes available. Assistance in detailed planning can be obtained from the local representative of the Soil Con-

servation Service, or from representatives of the Extension Service of the Louisiana Agricultural Experiment Station.

Fertilization and liming.—This section gives only general information on fertilizer needs. The amount of fertilizer needed depends on (1) the crop to be grown, (2) past cropping history, (3) crop growth desired, and (4) kind of soil. Specific requirements for fertilizer and lime to be applied should be determined by laboratory analysis of soil samples.

Soil sampled for laboratory testing should consist of a single kind of soil that represents no more than 10 acres. Agricultural agencies in the parish can supply detailed information and instruction regarding collecting and testing of soil samples.

The soils of Ouachita Parish are acid in the upper 20 inches. They are all generally low in content of organic matter and in available nitrogen. All of the soils of the parish require phosphorus, potassium, and nitrogen for cultivated crops and pasture. Legumes, however, generally do not need nitrogen. All soils of the parish need lime at times.

Maintaining organic matter.—Organic matter is important as a source of nitrogen for crop growth. It is also important in increasing water intake, reducing surface crusting, and in improving soil tilth. Organic matter can be built up and maintained by leaving plant residue on the soil, increasing plant growth, growing plants that have extensive root systems, adding barnyard manure, and growing perennial grasses and legumes in rotation with other crops. The maintenance of organic matter is made easier by liming and fertilizing. Most of the soils in Ouachita Parish, however, were never very high in organic-matter content, and it is not practical to build up large amounts of organic matter in them.

Tillage.—The major purpose of soil tillage is to prepare seedbeds and to control weeds. Preparing the seedbed, cultivating, and harvesting generally tend to destroy the structure of the surface layer. Excessive cultivation should be avoided. Some of the fine-textured soils in the parish puddle and become cloddy if cultivated. A compact layer forms in the medium-textured soils if they are plowed at the same depth for long periods or plowed when wet. This compact layer develops just below plow depth and generally is called a traffic pan or plowpan.

Some tillage implements stir the surface layer and leave crop residues on the soil surface. These residues protect the surface from beating rains and help reduce runoff, control erosion, and increase infiltration.

Drainage.—Many of the soils in the parish need surface drainage to make them more suitable for crops and pasture. At one time drainage consisted of a complex pattern of main ditches, laterals, and field drains. Now, the drainage in this parish is mainly a combination of land leveling and grading and a minimum of open ditches. This practice creates larger and more uniformly shaped fields that are better suited to the use of modern multirow farm equipment.

Cropping systems.—A cropping system suitable for use in this parish consists of a legume to supply nitrogen, a cultivated crop to aid in weed control, a deep-rooted crop to utilize substratum fertility and keep the substratum permeable, and a close-growing crop to supply organic matter. The sequence of crops should be such that the soil is covered as much of the year as possible.

Capability grouping

Capability grouping shows, in a general way, the suitability of soils for most kinds of field crops. The groups are made according to the limitations of the soils when used for field crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to rice, horticultural crops, or other crops requiring special management.

Those familiar with the capability classification can infer from it much about the behavior of soils when used for other purposes, but this classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for range, for forest trees, or engineering.

In the capability system, all kinds of soil are grouped at three levels: the capability class, the subclass, and the unit. These levels are described in the following paragraphs.

Capability Classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use, 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, require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants, 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 largely to pasture or range, woodland, or wildlife habitat.

Class VI soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife habitat.

Class VII soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture or range, woodland, or wildlife habitat. (No class VII soils in Ouachita Parish.)

Class VIII soils and landforms have limitations that preclude their use for commercial crop production and restrict their use to recreation, wildlife, or water supply, or to esthetic purposes. (No class VIII soils in Ouachita Parish.)

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 can contain, at the most, only the subclasses indicated by *w*, *s*, and *c*, because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use largely to pasture, range, woodland, wildlife, or recreation.

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 and other responses to management. 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–2 or IIIe–1. Thus, in one symbol, the Roman numeral designates the capability class, or degree of limitation; the small letter indicates the subclass, or kind of limitation, as defined in the foregoing paragraph; and the Arabic numeral specifically identifies the capability unit within each subclass.

Management by capability units

In the following pages each of the capability units in Ouachita Parish is described and suggestions for use and management are given. The capability designation for each soil in the parish can be found in the "Guide to Mapping Units" at the back of this survey.

CAPABILITY UNIT I–1

The unit consists of level, well-drained, moderately permeable to moderately slowly permeable soils. These soils are medium to high in natural fertility. They are friable and fairly easy to keep in good tilth. The supply of moisture is adequate for cultivated crops and pasture plants in most years. Air and water movement within the soils is good. These soils can be worked throughout a fairly wide range of moisture content.

About 80 percent of the acreage is used for cultivated crops, and a small part for pasture. Well-suited cultivated crops are cotton, corn, soybeans, oats, wheat, millet, grain sorghum, and truck crops. Well-suited pasture plants include common bermudagrass, Coastal bermudagrass, Pensacola bahiagrass, ryegrass, crimson clover, white clover, red clover, vetch, and southern wild winter peas. Hay generally can be harvested from pastures during periods of peak growth.

A plowpan tends to form in cultivated areas, but it can be broken by chiseling or deep plowing. Land grading for drainage and land leveling for irrigation improve surface drainage and increase the efficiency of farm equipment, especially multirow equipment. Crops on these soils respond well to fertilizer.

CAPABILITY UNIT IIe–1

This unit consists of nearly level, well-drained, moderately permeable to moderately slowly permeable soils. These soils are medium in natural fertility. They are fairly easy to keep in good tilth. In most years the supply of moisture is adequate for cultivated crops and pasture plants. The movement of air and water within the soil is good to fair. These soils can be worked throughout a wide range of moisture content.

Most of the acreage is used for cultivated crops. A very small acreage is used for pasture. Well-suited crops are cotton, corn, soybeans, oats, wheat, millet, grain sorghum, and truck crops. Well-suited pasture plants are common bermudagrass, Coastal bermudagrass, Pensacola bahiagrass, ryegrass, crimson clover, white clover, red clover, vetch, and southern wild winter peas.

A plowpan tends to form if these soils are cultivated, but it can be eliminated by deep plowing or chiseling. Proper row direction and row length are required to reduce the hazard of erosion in cultivated areas. Crops on these soils respond well to fertilizer.

CAPABILITY UNIT IIe–2

This unit consists of nearly level, moderately well drained to well drained, moderately permeable to slowly permeable soils. These soils are moderately low to low in natural fertility. Good tilth is fairly easy to maintain, but the surface tends to crust if these soils are clean tilled. In some years pasture plants and cultivated crops are damaged by lack of moisture late in summer and in fall. Air and water movement within the soil is fair to good. These soils can be worked throughout a fairly wide range of moisture content.

More than 80 percent of the acreage is woodland. The rest is used for truck crops, gardens, and pasture. Suitable cultivated crops are corn, cotton, truck crops, oats, wheat, grain sorghum, and millet. Suitable pasture plants include common bermudagrass, Coastal bermudagrass, Pensacola bahiagrass, crimson clover, ryegrass, and southern wild winter peas.

Cultivating on the contour reduces the hazard of erosion. Crops on these soils respond well to fertilizer.

CAPABILITY UNIT IIw–1

This unit consists of level to depressional, somewhat poorly drained, moderately slowly permeable soils. These soils are medium in natural fertility, are friable, and are fairly easy to keep in good tilth. The supply of moisture is adequate for cultivated crops and pasture plants in most years. Air and water movement within the soil is fair. These soils can be worked throughout a fairly wide range of moisture content.

About 70 percent of the acreage is used for cultivated crops, and 20 percent is used for pasture. Well-suited cultivated crops are cotton, corn, soybeans, oats, wheat, millet, grain sorghum, and truck crops. Well-suited pasture plants include common bermudagrass, Coastal bermudagrass, white clover, dallisgrass, ryegrass, Pensacola bahiagrass, vetch, and southern wild winter peas.

A plowpan tends to form in cultivated areas, but it can be broken by deep plowing or chiseling. Drainage is needed for cultivated crops and pasture. Land grading for drainage and land leveling for irrigation improve surface drainage and increase efficiency of farm equipment, especially multirow equipment. Crops on these soils respond well to fertilizer.

CAPABILITY UNIT IIw-2

This unit consists of level to nearly level, somewhat poorly drained, slowly permeable soils. These soils are low in natural fertility. They are fairly easy to keep in good tilth, but the surface tends to crust if the soils are clean tilled. These soils are generally wet in winter and spring.

About 90 percent of the acreage is used for woodland. A small acreage is used for pasture. Suitable cultivated crops are cotton, corn, soybeans, and truck crops. Suitable pasture plants are common bermudagrass, Coastal bermudagrass, ryegrass, Pensacola bahiagrass, white clover, and southern wild winter peas.

The level areas require drainage for cultivated crops and pasture. In sloping areas the hazard of erosion can be reduced by cultivating on the contour. Crops and pasture plants are sometimes damaged by lack of moisture in summer and fall. Crop response to fertilizer is fair.

CAPABILITY UNIT IIw-3

This unit consists of undulating, well-drained to somewhat poorly drained, moderately slowly permeable soils. These soils are medium in natural fertility. Tilth is easily maintained in the friable soils on ridges, but it is difficult to maintain in the swales. In most years the moisture supply is adequate for crops and pasture plants. Air and water movement within the soils on ridges is good but is poor to fair in the swales. Cultivation of row crops is difficult because the slopes of the ridges are short and irregular, the swales are narrow and wet, and the texture of the surface layers varies.

About 90 percent of the acreage is used for cultivated crops. Small areas are wooded and pastured. Suitable cultivated crops are cotton, corn, soybeans, oats, wheat, truck crops, millet, and grain sorghum. Suitable pasture plants are common bermudagrass, Coastal bermudagrass, white clover, dallisgrass, ryegrass, Pensacola bahiagrass, and southern wild winter peas.

Drainage is needed in the swales for cultivated crops and pasture. Land leveling or grading improves drainage and the efficiency of farm machinery, but in places it is necessary to work large volumes of earth. Crops on these soils respond well to fertilizer.

CAPABILITY UNIT IIIe-1

This unit consists of gently sloping to moderately sloping, well drained to moderately well drained, slowly permeable to moderately permeable soils. These soils are medium to low in natural fertility. They are friable and fairly easy to keep in good tilth. The supply of moisture is generally adequate for cultivated crops in spring and early in summer. In some years pasture plants and cultivated crops are damaged by lack of moisture during dry periods late in summer and in fall. Air and water movement within the soil is fair to good. These soils can be worked throughout a wide range of moisture content.

About 60 percent of the acreage is used for woodland, and 40 percent for pasture and cultivated crops. Suitable cultivated crops are cotton, corn, soybeans, peaches, truck crops, oats, millet, and grain sorghum. Suitable pasture plants are common bermudagrass, Coastal bermudagrass (fig. 9), Pensacola bahiagrass, ryegrass, crimson clover, millet, hybrid sorghums, vetch, and southern wild winter peas.

Terracing, stripcropping, rotating with close-growing plants, or other erosion control practices are needed to reduce runoff and erosion in cultivated areas. Crop response to fertilizer is moderate to good.

CAPABILITY UNIT IIIw-1

This unit consists of level to depressional, poorly drained to somewhat poorly drained, very slowly permeable soils. These soils are moderately low to low in natural fertility. The clayey texture and wetness make good tilth difficult to maintain. Movement of air and water within the soil is poor. In some years the supply of moisture is inadequate for cultivated crops and pasture plants during dry periods. These soils are saturated with water for long periods in winter and early in spring. At times small areas are flooded for short periods. These soils can be cultivated only within a narrow range of moisture content. They crack when dry. They swell and seal over when wet and become cloddy if cultivated. Good seedbeds are difficult to prepare, and adequate crop stands may be hard to obtain.

About 60 percent of the acreage is used for woodland, and about 30 percent is used for soybeans and pasture. Suitable crops are rice, soybeans, cotton, grain sorghum, oats, and wheat. Corn is not well suited. Suitable pasture plants include tall fescue, white clover, dallisgrass, Pensacola bahiagrass, common bermudagrass, and southern wild winter peas. Coastal bermudagrass is somewhat difficult to establish.

Drainage is needed for cultivated crops and pasture plants. Land grading for drainage and leveling for irrigation improve surface drainage and the efficiency of farm machinery, especially multirow equipment. At times poor trafficability restricts grazing during wet periods. Crop response to fertilizer is moderate.

CAPABILITY UNIT IIIw-2

The only soil in this capability unit is Portland silt loam. This soil is level, somewhat poorly drained, and very slowly permeable. It has moderately low natural fertility. Good tilth is fairly easy to maintain. The surface tends to crust if this soil is clean tilled. The supply of moisture is adequate for cultivated crops and pasture plants in most years. Movement of air and water is good in the surface layer and fair to poor in the subsoil.

About 90 percent of the acreage is used for cultivated crops. A small acreage is in pasture. Suitable cultivated crops are cotton, corn, rice, soybeans, oats, wheat, millet, and grain sorghum. Well-suited pasture plants are common bermudagrass, Coastal bermudagrass, Pensacola bahiagrass, dallisgrass, ryegrass, white clover, tall fescue, and southern wild winter peas.

Drainage is needed for cultivated crops and pastures. Land grading for drainage and land leveling for irrigation improve surface drainage and the efficiency of farm machinery, especially multirow equipment. At times poor trafficability restricts grazing during wet periods. Crops on this soil respond well to fertilizer.

CAPABILITY UNIT IIIw-3

This unit consists of level to depressional, poorly drained, very slowly permeable soils. These soils are low to moderately low in natural fertility. Good tilth is somewhat difficult to maintain. The soils tend to crust if they

Figure 9.—**Coastal bermudagrass on Ruston-Lucy association, undulating. Capability unit IIIe-1.**

are clean tilled. They are generally wet for long periods in winter and early in spring. At times they are flooded for short periods in some areas. In some years the moisture supply is inadequate for cultivated crops and pasture plants during dry periods late in summer and in fall. Air and water movement within the soil is poor. These soils can be worked within only a moderate range of moisture content.

About 20 percent of the acreage is used for pasture and cultivated crops. About 80 percent is used for woodland. Cotton, corn, oats, wheat, and grain sorghum can be grown but are not well suited. Rice is well suited. Soybeans are fairly well suited. Suitable pasture plants are common bermudagrass, Pensacola bahiagrass, white clover, ryegrass, vetch, and southern wild winter peas.

Drainage is needed for pasture and cultivated crops. Crop response to fertilizer is fair.

CAPABILITY UNIT IIIw-4

The only soil in this capability unit is Crowley silt loam. This soil is level, poorly drained to somewhat poorly drained, and very slowly permeable. It has low natural fertility. Good tilth is somewhat difficult to maintain. The surface tends to crust if this soil is clean tilled. The soil is wet for long periods in winter and spring. In some years the supply of moisture is inadequate for cultivated crops and pasture plants during dry periods late in summer and in fall. Air and water movement within the soil is fair to poor.

Most of the acreage is used for pasture or is idle. A small acreage is used for cultivated crops and woodland. Cultivated crops are not very well suited, but cotton, oats, wheat, millet, and grain sorghum can be grown. Rice is well suited. Soybeans are fairly well suited. Pasture plants, such as white clover, dallisgrass, ryegrass,

common bermudagrass, vetch, and southern wild winter peas, are fairly well suited.

Drainage is generally needed for cultivated crops and pasture. Land grading for drainage and land leveling for irrigation improve surface drainage and the efficiency of farm equipment. Crop response to fertilizer is moderate.

CAPABILITY UNIT IIIs–1

This unit consists of nearly level to gently sloping, well-drained to excessively drained, rapidly permeable soils. These soils have low natural fertility. They are loose and friable and can be cultivated throughout a wide range of moisture content. Adequate stands are sometimes difficult to establish. In most years, the supply of moisture is adequate in spring for cultivated crops but is inadequate in summer and fall. Because these soils are sandy, traction for farm equipment is poor in dry periods.

About 50 percent of the acreage is woodland, and 50 percent is used for truck crops. Cotton and corn are fairly well suited, and early season truck crops are well suited. Watermelons and field peas are the major crops. Most pasture plants are poorly suited because the available water capacity is low.

The response to fertilizer is moderate.

CAPABILITY UNIT IVe–1

The soils in this unit are moderately sloping to strongly sloping, well drained or moderately well drained, and moderately permeable to moderately slowly permeable. They are low in natural fertility, but they are friable and easily cultivated throughout a wide range of moisture content. In cultivated areas terracing, stripcropping, rotation with close growing plants, use of cover crops, and other erosion control practices are needed to reduce runoff and hazard of erosion. In some years cultivated crops and pasture plants are damaged by lack of moisture during dry periods in summer and fall. Air and water movement within the soil is good.

About half the acreage is used for pasture and hay crops. The rest is used for woodland. Suitable crops are cotton, corn, oats, peaches, millet, grain sorghum, and truck crops. Suitable pasture plants include crimson clover, Pensacola bahiagrass, common bermudagrass, Coastal bermudagrass, ryegrass, and southern wild winter peas.

Crop response to fertilizer is good.

CAPABILITY UNIT IVw–1

The only soil in this unit is Leaf silt loam, occasionally flooded. This soil is level, poorly drained, very slowly permeable, and subject to flooding. It is low in natural fertility. Good tilth is difficult to maintain because this soil is wet and has variable texture in the surface layer. In most years this soil is subject to flooding by backwater in winter and spring, and in some years it is subject to flooding in summer and fall. Movement of air and water within the soil is poor. At times cultivated crops and pasture plants are damaged by lack of moisture during dry periods late in summer and in fall.

Practically all the acreage is used for woodland. This soil is generally not suited to cultivated crops, but soybeans, rice, and millet can be grown in areas where summer flooding is not too severe. In these areas suitable pasture plants are common bermudagrass, dallisgrass, and Pensacola bahiagrass.

Drainage is needed for cultivated crops and pasture. Crop response to fertilizer is poor to fair.

CAPABILITY UNIT IVw–2

The only soil in this unit is Perry clay, occasionally flooded. This soil is level to depressional, poorly drained, very slowly permeable, and subject to occasional flooding. It has moderately low natural fertility. The clayey texture of the surface layer and wetness make good tilth difficult to maintain. Movement of air and water within the soil is poor. In some years the supply of moisture is not adequate for crops during dry periods. The soil is saturated with water for long periods in winter and spring. The soil cracks when dry. It swells and seals over when wet and becomes cloddy if cultivated. It can be cultivated within only a narrow range of moisture content. Good seedbeds are difficult to prepare, and adequate crop stands are hard to maintain. Some areas are subject to flooding.

About 35 percent of the acreage is used for cultivated crops, and the rest is woodland. Rice is well suited, and soybeans are fairly well suited. Coastal bermudagrass, cotton, and corn are not so well suited. Grain sorghum, oats, and wheat are suited where flooding is not too severe. Suitable pasture plants include tall fescue, white clover, dallisgrass, Pensacola bahiagrass, common bermudagrass, and southern wild winter peas.

Local investigations are needed to determine frequency and depth of flooding in individual areas of this soil.

Drainage is needed for cultivated crops and pastures. Crop response to fertilizer is moderate.

CAPABILITY UNIT IVw–3

Only Barclay-Rosebloom complex, occasionally flooded, is in this unit. These soils are undulating, somewhat poorly drained to poorly drained, and slowly permeable to moderately permeable. They are subject to flooding, especially in winter and spring. They are medium to low in natural fertility. Good tilth is easily maintained on the ridges, but it is difficult to maintain in the swales. The supply of moisture is generally adequate for pasture plants. Air and water movement within the soils is good on the ridges and poor in the swales.

Most of the acreage is woodland. A small acreage is used for pasture. Deep flooding by the Ouachita River limits the use of these soils for cultivated crops. Summer annuals, such as soybeans, can be grown, but risk of damage by flooding is high. Common bermudagrass is suited. Dallisgrass, Coastal bermudagrass, white clover, and southern wild winter peas can be grown where flooding is not too severe.

Local investigations are nceessary to determine the frequency, depth, and season of flooding in individual areas.

Crops on these soils respond well to fertilizer.

CAPABILITY UNIT IVs–1

This unit consists of moderately sloping, well-drained or excessively drained, moderately permeable to rapidly permeable soils. These soils are low in natural fertility and in available water capacity. They are loose and friable and easily worked throughout a wide range of moisture content. Good stands are sometimes difficult to estab-

lish. Air and water movement within the soil is good. When these soils are dry, traction for farm equipment is poor because the surface layer is sandy.

About 90 percent of the acreage is used for woodland. A small acreage is used for truck crops. Watermelons and field peas are the principal crops. Low available water capacity makes these soils poorly suited to most cultivated crops and pasture plants.

Crop response to fertilizer is moderate.

CAPABILITY UNIT Vw–1

This unit consists of level to depressional, poorly drained, very slowly permeable soils that are subject to flooding. These soils are low to moderately low in natural fertility. Air and water movement within the soil is poor.

Practically all the acreage is woodland. Deep annual flooding precludes use of these soils for most cultivated crops and many pasture plants. Common bermudagrass, white clover, dallisgrass, and southern wild winter peas can be grown with limited success in areas where flooding is not too severe.

Poor trafficability restricts grazing during flood periods and at times restricts it during other wet periods.

Crop response to fertilizer is fair.

CAPABILITY UNIT Vw–2

Only Guyton-Rosebloom complex, frequently flooded, is in this unit. These soils are level, poorly drained, slowly permeable to very slowly permeable, and subject to flooding. They are low in natural fertility. The supply of moisture is generally adequate for pasture plants.

About 85 percent of the acreage is woodland. A small acreage is used for pasture. These soils are in the drainageways and receive runoff water from the adjacent uplands. The frequent rapidly moving floodwaters preclude use of these soils for cultivated crops. Common bermudagrass is a suitable pasture plant. Coastal bermudagrass, dallisgrass, Pensacola bahiagrass, white clover, and southern wild winter peas can be grown with limited success in areas where the flooding hazard is not too severe.

Crop response to fertilizer is moderate.

CAPABILITY UNIT VIe–1

This unit consists of strongly sloping to steep, well-drained, moderately permeable to moderately slowly permeable soils. These soils are low in natural fertility. They are friable, and seedbeds are easily prepared. Steep slopes limit the efficiency of farm equipment. In some years pasture plants are damaged by lack of moisture during dry periods in summer and fall.

About 95 percent of the acreage is used for woodland. A small acreage is used for pasture. The erosion hazard precludes use of these soils for cultivated crops. Suitable pasture plants include common bermudagrass, Coastal bermudagrass, Pensacola bahiagrass, crimson clover, and southern wild winter peas.

Crop response to fertilizer is moderate.

CAPABILITY UNIT VIe–2

This unit consists of moderately steep to steep, somewhat poorly drained to moderately well drained, very slowly permeable soils. These soils are medium to low in natural fertility. Seedbed preparation is very difficult on the steep irregular slopes. In some years pasture plants are damaged by lack of moisture during dry periods in summer and fall.

About 80 percent of the acreage is used for woodland and 20 percent for pasture. The erosion hazard on these soils generally makes them unsuited to cultivated crops. Pasture plants are fairly well suited on the small smooth ridgetops and upper slopes, but they are difficult to manage on the steeper slopes. Suitable pasture plants include common bermudagrass, Pensacola bahiagrass, crimson clover, vetch, and southern wild winter peas.

Crop response to fertilizer is moderate.

CAPABILITY UNIT VIe–3

This unit consists of strongly sloping, excessively drained to well drained, rapidly permeable soils. These soils are low in natural fertility and in available water capacity. They are loose and friable. The movement of air and water within the soils is good. The strong slopes and deep sandy surface layers limit the use of farm equipment.

Practically all the acreage is used for woodland. The steep slopes and droughty nature of these soils make them generally unsuited for cultivated crops and pasture plants. Coastal bermudagrass is fairly well suited.

Crop response to fertilizer is moderate.

Estimated yields

Table 2 lists, for each soil in the parish, the estimated average yield per acre of the principal crops under a high level of management. The estimates represent an average of the yields that can be obtained without irrigation over a 10-year period that has normal rainfall. The estimates are based largely on field observations made during the survey and on consultation with farmers and other agricultural workers. Variations from year to year are to be expected. Some farmers will exceed the estimates in table 2.

It is assumed that under a high level of management all the latest technological developments on farming are followed. These include the best known measures for preparing seedbeds, applying fertilizer and lime in amounts determined by soil tests, controlling insects, diseases, and weeds, and planting suitable varieties of seeds at adequate rates. If needed, steps are taken to control floods and erosion and to conserve soil and water.

Use of the Soils in Engineering [5]

Some soil properties are of special interest to engineers because they affect the construction and maintenance of roads, airports, pipelines, building foundations, facilities for water storage, erosion control structures, drainage systems, and sewage disposal systems. Among the properties most important to engineers are permeability, strength, consolidation characteristics, texture, plasticity, and soil reaction. Depth to unconsolidated materials and topography are also important.

[5] Prepared by LESTER L. LOFTIN, assistant State soil scientist and LARKIN B. AGNEW, assistant State conservation engineer, Soil Conservation Service, in cooperation with the Louisiana Department of Highways.

TABLE 2.—*Estimated average yields per acre of principal crops under a high level of management*

[Absence of figure indicates crop is not commonly grown or is not suited to the soil specified. Made land and Terrace escarpments are not used for crops and are not listed]

Soil	Cotton	Corn	Soybeans	Oats	Rice	Pasture plants			
						Coastal bermudagrass	Common bermudagrass	Pensacola bahiagrass	Tall fescue
	Lb. of lint	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Animal-unit-months* [1]	*Animal-unit-months* [1]	*Animal-unit-months* [1]	*Animal-unit-months* [1]
Alaga-Lucy association, undulating: [2]									
Alaga		25				7.0	4.0	4.5	
Lucy	425	35				8.5	5.5	6.5	
Alligator clay			24	25	85	7.0	5.5		8.5
Alligator clay, frequently flooded							3.0		
Barclay-Rosebloom complex, occasionally flooded:									
Barclay						8.0	4.5		
Rosebloom						6.5	3.8		
Cadeville association, hilly [2]							4.0	4.5	
Cadeville fine sandy loam, 5 to 20 percent slopes							4.0	4.0	
Crowley silt loam	400	45	25	45		7.0	5.5	6.0	
Frizzell silt loam, 0 to 1 percent slopes	450	50	27	50		8.5	6.0	7.0	
Frizzell silt loam, 1 to 3 percent slopes	425	45	25	45		8.5	6.5	7.0	
Gallion silt loam	875	80	35	60		12.0	8.5		
Guyton association [2]	400	35	22	42	85		5.0	6.0	
Guyton-Rosebloom complex, frequently flooded:									
Guyton							4.5		
Rosebloom							4.0		
Hebert silt loam	725	70	32	55	90	11.0	8.5		
Hebert silt loam, gently undulating	700	60	30	50		11.0	8.5		
Hebert complex	675	60	30	50		11.0	8.5		
Hebert-Perry complex, gently undulating:									
Hebert	700	60	30	50		11.0	8.5		
Perry	500	40	33	40		8.0	7.5		9.0
Kirvin-Ruston association, rolling: [2]									
Kirvin	475	50		45			4.0	4.5	
Ruston	500	60		50		10.0	7.0	8.0	
Leaf silt loam, occasionally flooded							3.5	3.0	
Muskogee silt loam, 3 to 5 percent slopes	450	45		40		9.0	6.5	7.0	
Ora fine sandy loam, 5 to 8 percent slopes	400	40		35		7.0	6.0	7.0	
Ora fine sandy loam, 8 to 12 percent slopes	375	35		30		6.5	5.5	6.5	
Ora-Savannah association, gently rolling: [2]									
Ora	400	40		35		7.0	5.5	7.0	
Savannah	425	40		40		9.0	6.5	7.5	
Perry clay, frequently flooded							3.0		
Perry clay, occasionally flooded	375		33		90		6.5		
Portland silt loam	550	45	33	45	90	9.5	7.5		
Portland clay	475	40	35	45	90	9.0	7.0		9.0
Providence silt loam, 1 to 3 percent slopes	500	55	25	50		8.0	6.0	6.5	
Providence silt loam, 3 to 6 percent slopes	500	50	25	50		8.0	6.0	6.5	
Rilla silt loam, 0 to 1 percent slopes	875	80	35	60		12.0	8.5		
Rilla silt loam, 1 to 3 percent slopes	850	70	32	55		11.5	8.0		
Rilla-Hebert complex, gently undulating:									
Rilla	700	60	30	50		11.5	8.0		
Hebert	675	60	30	45		10.5	7.5		
Ruston fine sandy loam, 1 to 3 percent slopes	575	65		50		10.5	7.5	8.5	
Ruston fine sandy loam, 3 to 8 percent slopes	530	50		45		10.5	7.0	8.0	
Ruston fine sandy loam, 8 to 12 percent slopes	425	40		35		10.0	6.5	7.5	
Ruston-Lucy association, undulating: [2]									
Ruston	510	50		55		10.5	7.0	8.0	
Lucy	425	35				8.5	5.5	6.5	
Ruston-Lucy association, hilly: [2]									
Ruston							5.5	6.5	
Lucy							4.5	6.0	
Savannah fine sandy loam, 1 to 5 percent slopes	450	45				9.0	6.5	7.5	
Sterlington silt loam, 0 to 1 percent slopes	850	80	35	60		12.5	9.0		
Sterlington silt loam, 1 to 3 percent slopes	825	75	33	60		12.5	9.0		
Waller loam	380	40	22		85		5.0	6.0	
Wrightsville silt loam	380		22				5.0	6.0	

[1] Animal-unit-month is a term used to express the carrying capacity of pasture. It is the number of animal units carried per acre, multiplied by the number of months the pasture is grazed during a single grazing season without injury to the sod. An acre of pasture that provides 2 months of grazing for 2 cows has a carrying capacity of 4 animal-unit-months.

[2] The composition of these units is more variable than that of the others in the parish but has been controlled well enough to interpret for the expected use of the soils.

Information concerning these and related soil properties is given in tables 3, 4, and 5, parts I and II. The estimates and interpretations in these tables can be used to—

1. Make studies that will aid in selecting and developing industrial, commercial, residential, and recreational sites.
2. Make studies that will aid in selecting locations for highways, parking areas, and airports, and in planning detailed investigations at the selected locations.
3. Locate sources of sand, gravel, highway subbase material, or other construction material.
4. Correlate performance of pavements with types of soil and thus develop information that will be useful in designing and maintaining highways.
5. Determine the suitability of soils for cross-country movement of vehicles and construction equipment.
6. Make preliminary estimates of soil properties for use in planning farm drainage systems, farm ponds, and irrigation systems.
7. Determine the limitations of soils for septic tanks and lagoons.
8. Supplement other published information, such as maps, reports, and aerial photographs, that is used in preparing engineering reports for a specific area.

The engineering interpretations reported here do not eliminate the need for sampling and testing at the site of specific engineering works involving heavy loads or excavations deeper than the depths reported (ordinarily about 5 feet). Even in these situations, however, the soil map is useful in planning more detailed field investigations and in indicating the kinds of problems that may be expected.

Some of the terms used by soil scientists have special meanings in soil science that may not be familiar to engineers. These terms are defined in the Glossary.

Engineering classification systems

The two systems most commonly used in classifying soils for engineering are the systems approved by the American Association of State Highway Officials (AASHO) and the Unified system.

The AASHO system (*1*) is used to classify soils according to those properties that affect use in highway construction. In this system all soil material is classified in seven principal groups. The groups range from A–1, which consists of soils that have the highest bearing strength and are the best soils for subgrade, to A–7, which consists of soils that have the lowest strength when wet. Within each group, the relative engineering value of the soil material is indicated by a group index number. The numbers range from 0, for the best material, to 20, for the poorest. The group index number is shown in parentheses following the soil group system (see table 3).

In the Unified system (*12*) soils are classified according to their texture and plasticity and their performance as engineering construction material. Soils are grouped in 15 classes. There are 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. GP and GW are clean gravels, and GM and GC are gravels that include, respectively, an appreciable amount of nonplastic and plastic fines. SP and SW are clean sands. SM and SC are sands that include fines of silt and clay. ML and CL are silts and clays that have a low liquid limit. Soils on the borderline between two classes are designated by symbols for both classes; for example, ML–CL.

Soil scientists use the USDA textural classification (*9*). In this classification, the texture of the soil is determined according to the proportion of soil particles smaller than 2 millimeters in diameter, that is, the proportion of sand, silt, and clay. Textural modifiers, such as gravelly, stony, shaly, and cobbly, are used as needed.

Table 3 shows the AASHO and Unified classification of specified soils in the parish, as determined by laboratory tests. Table 4 shows the estimated classification of all the soils in the parish according to all three systems of classification.

Engineering test data

The Louisiana Department of Highways tested the major layers of several soils in this parish. The results of these tests, which were made in accordance with standard procedures, are given in table 3. Since the soils were sampled to a depth of about 4 feet, the data are not adequate for estimating the characteristics of soils in deeper cuts.

The *mechanical analysis* data shown in table 3 were obtained by the combined hydrometer and sieve method. The tests for liquid limit and plastic limit measure the effect of water on the consistence of the soil material. A dry clayey soil material, for example, changes from a semisolid to a plastic state when the moisture content is increased. As the moisture content is further increased, the material changes from a plastic to a liquid state. The *plastic limit* is the moisture content at which the material passes from a semisolid to a plastic state. The *liquid limit* is the moisture content at which the material passes from a plastic to a liquid state. The *plasticity index* is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which the material is in a plastic state.

In construction work, engineers also are concerned with moisture density data and dispersion of soil materials.

Moisture-density, or compaction, data are important in earthwork, for as a rule, the soil is most stable if it is compacted to about the maximum dry density at approximately the optimum moisture content. If dry soil material is compacted at successively higher moisture content, assuming that the compactive effort remains constant, the density of the material increases until the optimum moisture content is reached. After that, the density decreases as the moisture content increases. The highest dry density obtained in the compaction test is termed *maximum dry density*, and the corresponding moisture content is the *optimum moisture*. A tolerance of 95 to 100 percent of maximum dry density is specified in many earthwork contracts.

Dispersion refers to the degree and speed that soil structure breaks down, or slakes, in water. A highly dispersed soil is one that sloughs readily, is highly erodible on slopes, and has low shear strength and high piping potential.

TABLE 3.—*Engineering*

[Tests performed by the Louisiana Department of Highways in accordance with standard

Soil	Louisiana Report Number	Depth	Mechanical analysis [1]					
			Percentage—passing sieve		Percentage smaller than—			
			No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.
		In.						
Cadeville fine sandy loam:	R–4883	0–7	97	61	60	43	24	18
SW¼SW¼ sec. 24, T. 17 N., R. 1 E.	R–4884	13–17	[4] 98	84	84	76	59	52
	R–4885	17–42	99	86	86	75	57	52
Frizzell silt loam:	R–4886	5–9	100	72	71	47	19	15
SE¼SW¼ sec. 5, T. 19 N., R. 5 E.	R–4887	14–30	[4] 95	71	69	49	24	19
	R–4888	41–58	99	82	81	65	39	34
Hebert silt loam:	5–85982	0–7	100	84	63	29	18	9
SW¼NW¼ sec. 26, T. 17 N., R. 4 E.	5–85983	14–24	100	90	73	45	32	27
	5–85984	37–50	100	76	51	27	20	16
Rilla silt loam:	5–85985	6–13	100	95	87	57	43	34
NE¼SE¼ sec. 9, T. 17 N., R. 4 E.	5–85986	19–30	100	94	77	43	29	23
	5–85987	44–60	100	77	59	32	22	18
Wrightsville silt loam:	5–85988	2–5	100	98	97	74	38	27
SE¼SE¼ sec. 17, T. 16 N., R. 4 E.	5–85989	9–19	100	99	99	86	62	53
	5–85990	41–50	100	99	99	87	59	46

[1] Mechanical analysis according to AASHO Designation: T 88–57 (*1*). Results by this procedure may differ somewhat from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHO procedure, the fine material is analyzed by the hydrometer method, and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method, and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions. The mechanical analysis data used in this table are not suitable for naming textural classes for soils.

test data

procedures of the American Association of State Highway Officials (AASHO)]

Liquid limit	Plasticity index	Physical characteristics				Engineering classification	
		Moisture-density data [2]					
		Maximum dry density	Optimum moisture content for maximum dry density	Moisture content for 95 percent of maximum dry density	Dispersion	AASHO	Unified [3]
		Lbs./cu. ft.		*Pct.*	*Pct.*		
21	6	113	15	11 to 18	8	A-4(5)	ML-CL.
53	33	([5])	([5])	([5])	3	A-7-6(19)	CH.
44	25	99	23	20 to 27	0	A-7-6(15)	CL.
([6])	([6])	([5])	([5])	([5])	16	A-4(8)	CL.
20	9	113	15	11 to 18	4	A-4(7)	CL.
38	21	106	19	15 to 21	8	A-6(12)	CL.
([6])	([6])	106	16	10 to 19	22	A-4(8)	ML.
31	15	108	17	13 to 21	13	A-6(10)	CL.
24	6	106	16	10 to 19	25	A-4(8)	ML-CL.
36	16	99	21	16 to 25	9	A-6(10	CL.
31	13	108	17	13 to 21	14	A-6(10)	CL.
23	4	106	16	10 to 19	14	A-4(8)	ML.
34	13	99	21	16 to 25	11	A-6(9)	CL.
63	37	96	24	10 to 29	15	A-7-6(20)	CH.
50	29	96	24	20 to 29	24	A-7-6(17)	CL.

[2] Based on AASHO Designation: T 99–70, Method A (*1*).

[3] SCS and BPR have agreed to consider that all soils having plasticity indexes within two points of the A-line are to be given a borderline classification. An example of a borderline classification obtained by this use is ML–CL.

[4] 100 percent passes sieve No. 10.

[5] Not determined.

[6] Nonplastic.

TABLE 4.—*Estimates of soil properties*

[An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or more kinds of soil. The soils in referring to other series that appear in the first column of this table. The symbol > means

Soil series and map symbol	Depth from surface (typical profile)	Classification			Percentage passing sieve—	
		USDA	Unified	AASHO	No. 40 0.42 mm.	No. 200 0.074 mm.
	In.					
*Alaga: Aa	0–72	Loamy fine sand	SM, SP–SM	A–2–4, A–3	50–75	8–30
For Lucy part of Aa, see Lucy series.						
Alligator: Ac, Af	0–78	Clay	CH	A–7–6		95–100
*Barclay: Br	0–4	Silt loam, very fine sandy loam.	ML	A–4	95–100	60–85
For Rosebloom part of Br, see Rosebloom series.	4–48	Very fine sandy loam, loam, silt loam.	ML–CL	A–4, A–6	95–100	80–90
Cadeville: Ca, CdE	0–7	Loam, fine sandy loam.	ML–CL, ML	A–4	95–100	55–65
	7–12	Silty clay loam, loam, sandy clay loam.	ML–CL, CL	A–4, A–6	95–100	55–70
	12–54	Clay, silty clay	CH, CL	A–7–6	95–100	80–95
Crowley: Cr	0–17	Silt loam	ML–CL	A–4	100	90–100
	17–48	Silty clay loam or clay.	CH	A–7–6	100	90–100
Frizzell: FrA, FrB	0–22	Silt loam, loam	ML, ML–CL, CL.	A–4	95–100	65–80
	22–35	Silt loam, loam	ML–CL, CL	A–4, A–6	95–100	65–80
	35–56	Silty clay loam	CL	A–6	9 –100	75–90
Gallion: Ga	0–9	Silt loam	ML	A–4	100	85–100
	9–33	Silty clay loam, silt loam.	ML–CL, CL	A–6	100	90–100
	33–48	Silt loam, loam, silty clay loam.	ML, ML–CL	A–4, A–6	100	85–100
*Guyton: Gu, Gy	0–23	Silt loam	ML, ML–CL	A–4	95–100	65–80
For Rosebloom part of Gy, see Rosebloom series.	23–70	Silt loam, silty clay loam, loam.	CL or ML–CL	A–4, A–6	95–100	75–90
*Hebert: Hb, HbB, He, HpB	0–10	Silt loam	ML	A–4	95–100	80–95
For Perry part of HpB, see Perry series.	10–37	Silty clay loam, clay loam, loam.	CL	A–6	95–100	85–95
	37–72	Silt loam, silty clay loam, loam.	ML–CL, CL	A–4, A–6	95–100	65–90
*Kirvin: Kr	0–13	Sandy loam, fine sandy loam.	SM or ML	A–2–4, A–4	85–95	30–65
For Ruston part of Kr, see Ruston series.	13–38	Sandy clay or clay	CH, CL	A–7–6	90–100	60–85
	38–57	Silty clay, sandy clay, clay loam.	CL, CH	A–6, A–7–6	90–100	60–75
Leaf: Le	0–6	Silt loam	ML–CL, CL	A–4	95–100	55–80
	6–48	Clay or silty clay	CL or CH	A–6, A–7–6	95–100	70–90
Lucy	0–28	Loamy sand, loamy fine sand.	SM	A–2–4, A–4	55–75	20–45
Mapped only with Ala_a and Ruston soils.	28–42	Sandy loam	SM	A–4	65–80	35–50
	42–92	Loam, fine sandy loam.	SC, SM, CL	A–4, A–6	75–85	40–65
Muskogee: MuC	0–20	Silt loam or silty clay loam.	ML–CL, CL	A–4, A–6	95–100	75–90
	20–27	Silty clay	CH	A–7–6	95–100	80–95
	27–84	Silty clay loam or silt loam.	CL, CH	A–6, A–7–6	95–100	80–95

See footnotes at end of table.

significant in engineering

such mapping units may have different properties and limitations and for this reason it is necessary to follow carefully the instructions for more than; < means less than. Absence of data indicates estimate was not made]

Reaction	Permeability	Available water capacity	Shrink-swell potential	Wetness hazard	Flooding hazard	Corrosivity	
						Uncoated steel	Concrete
pH	*In./hr.*	*In./in. of soil*					
4. 5–6. 0	>6. 3	0. 05–0. 08	Very low	None	None to slight.	Very low	Moderate.
(1)	<0. 06	0. 19–0. 20	Very high	Severe	Severe [2]	Very high	Moderate.
4. 5–6. 0	0. 63–2. 0	0. 22	Low	Moderate	Severe	High	Moderate.
4. 5–5. 5	0. 63–2. 0	0. 22	Low				
4. 5–6. 0	0. 63–2. 0	0–14–0. 22	Low	Slight	None to slight.	Very high	Moderate.
4. 5–5. 5	0. 20–0. 63	0. 14–0. 18	Low to moderate.				
4. 5–5. 5	<0. 06	0. 18–0. 20	High.				
4. 5–6. 5	0. 20–0. 63	0. 22–0. 23	Low	Moderate	(2)	High	Moderate.
4. 5–7. 3	<0. 06	0. 19–0. 21	High to very high.				
5. 5–6. 0	0. 20–0. 63	0. 21–0. 23	Low	Moderate	(2)	High	Moderate.
4. 5–5. 5	0. 20–0. 63	0. 21–0. 23	Low to moderate.				
4. 5–5. 0	0. 06–0. 63	0. 20–0. 22	Moderate.				
5. 5–6. 5	0. 63–0. 20	0. 21–0. 23	Low	None	None to slight.	Moderate	Low.
6. 5–7. 0	0. 20–0. 63	0. 20–0. 21	Moderate.				
7. 0–8. 0	0. 20–0. 63	0. 20–0. 23	Low.				
4. 5–5. 5	0. 20–0. 63	0. 21–0. 23	Low	Severe	Severe	High	High.
4. 5–6. 0	<0. 06	0. 20–0. 22	Low to moderate.				
5. 0–6. 0	0. 20–0. 63	0. 23	Low	Moderate	(2)	High	Moderate.
4. 5–5. 5	0. 20–0. 63	0. 21	Moderate.				
4. 5–6. 0	0. 20–0. 63	0. 18–0. 23	Low.				
5. 5–6. 0	0. 63–2. 00	0. 12–0. 14	Low	None	None to slight.	Moderate	Moderate.
4. 5–5. 5	0. 20–0. 63	0. 15–0. 20	Moderate.				
4. 5–5. 5	0. 20–0. 63	0. 15–0. 19	Moderate.				
4. 5–5. 5	0. 20–0. 63	0. 21–0. 23	Low	Severe	Severe	Very high	High.
4. 5–5. 0	<0. 06	0. 19–0. 20	High.				
5. 0–6. 0	>6. 30	0. 08–0. 12	Very low	None	None to slight.	Low	High.
4. 5–5. 5	2. 00–6. 30	0. 10–0. 15	Low.				
4. 5–5. 0	0. 63–2. 0	0. 12–0. 16	Low.				
4. 5–5. 5	0. 20–0. 63	0. 21–0. 23	Moderate, low.	Slight	None to slight.	High	Moderate.
4. 5–5. 5	<0. 20	0. 18–0. 20	High.				
4. 5–7. 8	<0. 20	0. 18–0. 20	Moderate to high.				

TABLE 4.—*Estimates of soil properties*

Soil series and map symbol	Depth from surface (typical profile)	Classification			Percentage passing sieve—	
		USDA	Unified	AASHO	No. 40 0.42 mm.	No. 200 0.074 mm.
	In.					
*Ora: OrD, OrE, Os	0–13	Fine sandy loam	SM, ML	A–4, A–2–4	95–100	30–60
For Savannah part of Os, see Savannah series.	13–40	Sandy clay loam, loam	CL, SC	A–6	95–100	45–65
	40–60	Loam (fragipan)	CL, SC	A–4, A–6	95–100	45–65
Perry: Pc, Pe	0–58	Clay	CH	A–7–6		95–100
Portland: Po, Pr	0–9	Silt loam, silty clay loam, clay.	CL, CH	A–6, A–7–6		85–100
	9–47	Clay	CH	A–7–6, A–7–5		95–100
Providence: PvB, PvC	0–10	Silt loam	ML	A–4	95–100	65–80
	10–25	Silt loam, silty clay loam.	CL	A–6	95–100	70–85
	25–54	Silty clay loam, silt loam.	CL, ML–CL	A–6, A–4	95–100	65–80
*Rilla: RlA, RlB, RmB	0–8	Silt loam	ML	A–4	95–100	85–100
For Hebert part of RmB, see Hebert series.	8–35	Silty clay loam	CL	A–6	95–100	90–100
	35–69	Loam, silty clay loam, or silt loam.	ML, ML–CL	A–4, A–6	95–100	75–95
Rosebloom	0–8	Silt loam, very fine sandy loam.	ML, ML–CL	A–4	95–100	85–95
Mapped only with Barclay and Guyton soils.	8–60	Silty clay loam, silt loam.	CL, ML–CL	A–6, A–4	95–100	75–95
*Ruston: RsB, RsD, RsE, Ru, Ry	0–14	Fine sandy loam or sandy loam.	SM, ML	A–4, A–2–4	70–95	30–60
For Lucy part of Ru and Ry, see Lucy series.	14–42	Sandy clay loam, clay loam.	SC, CL	A–6	80–90	35–75
	42–90	Loam, fine sandy loam, sandy clay loam.	SC, SM, CL	A–6, A–4	75–95	35–65
Savannah: SaC	0–9	Fine sandy loam	ML, SM	A–4	95–100	40–60
	9–22	Sandy clay loam, loam	CL, ML–CL	A–6, A–4	95–100	50–75
	22–62	Fine sandy loam, loam, sandy clay loam.	ML–CL, CL	A–4, A–6	95–100	50–75
Sterlington: StA, StB	0–12	Silt loam	ML	A–4	90–100	60–85
	12–60	Very fine sandy loam, silt loam.	ML, ML–CL	A–4, A–6	90–100	80–90
Waller: Wa	0–24	Loam, fine sandy loam, silt loam.	SM, ML	A–4	95–100	35–60
	24–80	Clay loam, sandy clay loam, loam.	CL, SC	A–6	95–100	45–75
Wrightsville: Wr	0–16	Silt loam	ML–CL, ML, CL.	A–4, A–6	95–100	90–100
	16–48	Clay or silty clay	CH, CL	A–7–6	95–100	90–100

[1] 4.5–5.5 between depths of 10 and 40 inches. 5.0–8.4 at depth of more than 40 inches.

significant in engineering—Continued

Reaction	Permeability	Available water capacity	Shrink-swell potential	Wetness hazard	Flooding hazard	Corrosivity	
						Uncoated steel	Concrete
pH	*In./hr.*	*In./in. of soil*					
5. 0–6. 0	0. 63–2. 0	0. 12–0. 16	Low	None to slight.	None to slight.	Moderate	Moderate.
4. 5–5. 5	0. 63–2. 0	0. 15–0. 18	Low.				
4. 5–5. 0	0. 20–2. 0	0. 12–0. 16	Low.				
4. 5–8. 4	<0. 06	0. 18–0. 20	Very high	Severe	Severe	Very high	Low to moderate.
4. 5–6. 0	0. 06–0. 20	0. 20–0. 23	Moderate to high.	Moderate	(2)	Very high	Low to moderate.
4. 5–8. 4	<0. 06	0. 19–0. 20	Very high.				
5. 0–6. 0	0. 63–2. 0	0. 20–0. 22	Low	Slight	None to slight.	Moderate	Moderate.
4. 5–5. 5	0. 63–2. 0	0. 20–0. 22	Low to moderate.				
4. 5–5. 0	0. 06–0. 20	0. 10–0. 15	Low.				
5. 5–6. 5	0. 63–2. 0	0. 23	Low	None	None to slight where protected by levees.[2]	Moderate	Moderate.
5. 0–6. 0	0. 20–0. 63	0. 21	Moderate.				
4. 5–6. 0	0. 20–0. 63	0. 18–0. 23	Low.				
5. 0–6. 0	0. 63–2. 0	0. 21–0. 22	Low	Severe	Severe	High	Moderate.
4. 5–5. 0	0. 06–0. 20	0. 20–0. 22	Low to moderate.				
4. 5–6. 0	0. 63–2. 0	0. 14–0. 16	Very low	None	None to slight.	Low	Moderate.
4. 5–5. 5	0. 63–2. 0	0. 15–0. 17	Low.				
4. 5–5. 0	0. 63–2. 0	0. 14–0. 18	Low.				
5. 6–6. 0	0. 63–2. 0	0. 14–0. 16	Low	Slight	None to slight.	Moderate	Moderate.
4. 5–6. 0	0. 20–0. 63	0. 15–0. 17	Low to moderate.				
4. 5–6. 0	<0. 20	0. 10–0. 15	Low.				
4. 5–6. 5	0. 63–2. 0	0. 22	Low	(1)	None to slight.	Low	Moderate.
4. 5–6. 5	0. 63–2. 0	0. 22	Low.				
4. 5–6. 0	0. 20–0. 63	0. 14–0. 18	Low	Severe	(2)	High	High.
4. 5–6. 0	<0. 06	0. 15–0. 17	Low.				
4. 5–5. 5	0. 20–0. 63	0. 21–0. 23	Low	Severe	(2)	Very high	Medium.
4. 5–5. 5	<0. 06	0. 18–0. 20	High.				

[2] Local investigations are necessary to determine flooding hazard on these soils. Many of these areas are not subject to flooding. The other areas are subject to flooding of variable frequency and duration but mostly are subject to only occasional flooding of short duration.

TABLE 5.—*Engineering*

[An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or more kinds of soil. The soils for referring to other series that appear in the first column of this table. Made land and

Soil and map symbols	Degree and kinds of limitations for—			
	Homesites	Septic tank filter fields	Sewage lagoons	Landscaping and gardening
*Alaga: Aa For Lucy part of Aa, see Lucy series.	Slight if slope is less than 12 percent, moderate if more than 12 percent.	Slight if slope is less than 5 percent, moderate if 5 to 10 percent slopes, severe if more than 10 percent.	Severe: rapid permeability; poor embankment material; slope, if more than 2 percent.	Severe: low water holding capacity; low fertility; slope, if more than 8 percent.
Alligator: Ac, Af	Severe: severe wetness; very high shrink swell; very severe if flooded.	Severe: very slow permeability; severe wetness; some areas flood.	Slight unless flooded; severe if floodwaters are deep.	Severe: severe wetness; difficult to work; some areas flood.
*Barclay: Br For Rosebloom part of Br, see Rosebloom series.	Very severe: severe flooding hazard; moderate wetness.	Severe: severe flood hazard; moderate wetness.	Moderate: moderate permeability; severe if floodwaters are deep.	Severe: severe flood hazard; moderate wetness.
Cadeville: Ca, CdE	Moderate: high shrink swell in subsoil. Severe if slope is more than 12 percent.	Severe: very slow permeability; slope, if more than 10 percent.	Slight if slope is less than 2 percent, moderate if 2 to 7 percent, severe if more than 7 percent.	Severe: low fertility; clayey subsoil; slope, if more than 8 percent.
Crowley: Cr	Severe: moderate to severe wetness; high shrink swell below 17 inches; some flooding from local accumulations.	Severe: moderate to severe wetness; very slow permeability; some flooding from local accumulations.	Slight	Moderate: moderate to severe wetness; clayey subsoil; some flooding from local accumulations.
Frizzell: FrA, FrB	Moderate: moderate wetness; some flooding from local accumulations.	Severe: moderate wetness; slow permeability; some flooding from local accumulations.	Slight if slope is less than 2 percent; moderate if more than 2 percent.	Moderate: moderate wetness; low fertility; some flooding from local accumulations.
Gallion: Ga	Slight	Severe: moderately slow permeability.	Slight if slope is less than 2 percent, moderate if more than 2 percent.	Slight
*Guyton: Gu, Gy For Rosebloom part of Gy, see Rosebloom series.	Moderate to severe: severe wetness. Very severe if flooded.	Severe: very slow permeability; severe wetness; some areas flood.	Moderate: fair dam material. Severe if floodwaters are deep.	Severe: low fertility; severe wetness; some areas flood.
*Hebert: Hb, HbB, He, HpB For Perry part of HpB, see Perry series.	Moderate: moderate wetness. Very severe if flooded.	Severe: moderately slow permeability; moderate wetness; some areas flood.	Slight	Moderate: moderate wetness; some areas flood.

interpretations, part I

in such mapping units may have different properties and limitations, and for this reason it is necessary to follow carefully the instructions Terrace escarpments are variable and no valid estimates can be made. These soils are not listed]

Degree and kinds of limitations for—Continued					
Picnic areas and golf fairways	Playgrounds	Paved streets, airport runways, and parking areas	Highway location	Ponds and reservoir areas	Foundations for low buildings
Moderate: poor traction when dry; difficult to get good grass sod on golf fairways. Severe if slope is more than 15 percent.	Severe: poor trafficability when dry; difficult to get good grass sod; slope, if more than 2 percent.	Slight if slope is less than 3 percent, moderate if 3 to 8 percent, severe if more than 8 percent.	Slight if slope is less than 6 percent, moderate if 6 to 15 percent, severe if more than 15 percent.	Severe: seepage rate generally too great for water impoundment.	Slight if slope is less than 6 percent, moderate if 6 to 15 percent, severe if more than 15 percent.
Severe: severe wetness; poor trafficability; cracking; some areas flood.	Severe: severe wetness; poor trafficability; cracking; some areas flood.	Severe: severe wetness; poor subgrade material; difficult to work; some areas flood.	Severe: severe wetness; very poor traffic supporting capacity; some areas flood; very high shrink swell.	Slight: suitable for water impoundment.	Severe: poor shear strength; very high shrink swell; high compressibility; severe wetness.
Severe: severe flood hazard; moderate wetness.	Severe: severe flood hazard; moderate wetness.	Severe: subject to severe flooding; moderate wetness; fair subgrade material.	Severe: subject to severe flooding; moderate wetness.	Moderate: moderate seepage.	Severe: subject to severe flooding; moderate wetness.
Moderate: fair trafficability because of clay subsoil. Severe if slope is more than 15 percent.	Severe: fair trafficability because of clay subsoil; slope, if more than 15 percent.	Severe: poor subgrade material; slope, if more than 8 percent.	Severe: poor traffic supporting capacity; slope, if more than 15 percent; high shrink swell in subsoil.	Slight: topography favorable for dam-type pond.	Severe: poor shear strength; high shrink swell in subsoil; high compressibility
Moderate: moderate to severe wetness; some flooding from local accumulations.	Severe: moderate to severe wetness; some flooding from local accumulations.	Severe: moderate to severe wetness; poor subgrade material.	Severe: moderate to severe wetness; fairly low traffic supporting capacity; high shrink swell in subsoil.	Slight: topography generally too flat for dam-type pond.	Severe: high compressibility and shrink swell below depth of 17 inches; moderate to severe wetness.
Moderate: moderate wetness; some flooding from local accumulations.	Moderate: moderate wetness; some flooding from local accumulations.	Moderate: moderate wetness; fair subgrade material.	Moderate: moderate wetness; fair traffic supporting capacity.	Slight: in places some seepage from dugout.	Moderate: fair shear strength; moderate wetness; medium compressibility.
Slight	Slight if slope is less than 2 percent, moderate if more than 2 percent.	Moderate: fair subgrade material.	Moderate: fair traffic supporting capacity.	Moderate: topography generally too flat for dam-type pond; in some areas excess seepage from dugout pond.	Moderate: fair shear strength; medium compressibility.
Severe: severe wetness; some areas flood.	Severe: severe wetness; some areas flood.	Severe: severe wetness; poor subgrade material; some areas flood.	Severe: severe wetness; some areas flood; moderate traffic supporting capacity.	Slight: topography too flat for dam-type pond.	Severe: fair shear strength; severe wetness; subject to piping; medium compressibility; some areas flood.
Moderate: moderate wetness; some areas flood.	Moderate: moderate wetness; some areas flood.	Moderate: moderate wetness; fair subgrade material; some areas flood.	Moderate: moderate wetness; fair traffic supporting capacity; some areas flood.	Moderate: topography too flat for dam-type pond; some seepage.	Moderate: fair shear strength; moderate wetness; medium compressibility.

TABLE 5.—*Engineering*

Soil and map symbols	Degree and kinds of limitations for—			
	Homesites	Septic tank filter fields	Sewage lagoons	Landscaping and gardening
*Kirvin: Kr For Ruston part of Kr, see Ruston series.	Moderate: moderate shrink swell in subsoil; slope, if more than 12 percent.	Severe: moderately slow permeability; slope if more than 10 percent.	Slight if slope is less that 2 percent, moderate if 2 to 7 percent, severe if more 7 percent.	Moderate: low fertility; clayey subsoil. Severe if more than 8 percent.
Leaf: Le	Severe: severe wetness; high shrink swell in subsoil. Very severe if flooded.	Severe: very slow permeability; severe wetness; most areas flood.	Slight unless flooded. Severe if floodwaters are deep.	Severe: severe wetness; clay subsoil; low fertility; most areas flood.
Lucy Mapped only with Alaga and Ruston soils.	Slight if slope is less than 12 percent, moderate if more than 12 percent.	Slight if slope is less than 5 percent, moderate if 5 to 10 percent, severe if more than 10 percent.	Severe: rapid permeability in surface layer; moderate permeability in subsoil.	Moderate: moderately low available water capacity; low fertility; slope, if more than 8 percent.
Muskogee: MuC	Slight	Severe: slow permeability.	Slight if slope is less than 2 percent, moderate if 2 to 7 percent.	Moderate: low fertility; clayey subsoil.
*Ora: OrD, OrE, Os For Savannah part of Os see Savannah series.	Slight	Severe: moderately slow permeability; slope, if more than 10 percent.	Slight if slope is less than 2 percent, moderate if 2 to 7 percent, severe if more than 7 percent.	Slight to moderate: low fertility.
Perry: Pc, Pe	Severe: severe wetness; very high shrink swell. Very severe if flooded.	Severe: very slow permeability; severe wetness; some areas flood.	Slight unless flooded. Severe if floodwaters are deep.	Severe: severe wetness; difficult to work; some areas flood.
Portland: Po, Pr	Severe: moderate wetness; very high shrink swell. Very severe if flooded.	Severe: very slow permeability; moderate wetness; some areas flood.	Slight	Severe: moderate wetness; difficult to work; some areas flood.
Providence: PvB, PvC	Slight	Severe: slow permeability; slight wetness.	Slight if slope is less than 2 percent, moderate if more than 2 percent.	Slight
*Rilla: RlA, RlB, RmB For Hebert part of RmB, see Hebert series.	Slight unless flooded. Very severe if flooded.	Severe: moderately slow permeability; some areas flood.	Slight if slope is less than 2 percent, moderate if more than 2 percent.	Slight unless flooded. Moderate if subject to occasional flooding.

interpretations, part I—Continued

Degree and kinds of limitations for—Continued					
Picnic areas and golf fairways	Playgrounds	Paved streets, airport runways, and parking areas	Highway location	Ponds and reservoir areas	Foundations for low buildings
Slight if slope is less than 8 percent, moderate if 8 to 15 percent, severe if more than 15 percent.	Moderate if slope is less than 6 percent, severe if more than 6 percent.	Moderate: fair subgrade material. Severe if slope is more than 8 percent.	Moderate: fair traffic supporting capacity. Severe if slope is more than 15 percent.	Moderate: topography generally favorable for dam-type ponds.	Moderate: moderate shrink swell; medium compressibility.
Severe: poor trafficability; severe wetness; most areas flood.	Severe: poor trafficability; severe wetness; most areas flood.	Severe: poor subgrade material; severe wetness; most areas flood.	Severe: low traffic supporting capacity; high shrink swell; severe wetness; most areas flood.	Slight: in places topography too flat for dam-type ponds.	Severe: poor shear strength; high shrink swell in subsoil; severe wetness; high compressibility.
Moderate: loamy fine sand furnishes poor traction if dry; somewhat difficult to establish fairway sod.	Moderate: poor trafficability if dry. Severe if slope is more than 6 percent.	Slight if slope is less than 3 percent, moderate if 3 to 8 percent, severe if more than 8 percent.	Slight if slope is less than 6 percent, moderate if 6 to 15 percent, severe if more than 15 percent.	Severe: in places seepage rate too great for water impoundment.	Slight if slope is less than 6 percent, moderate if 6 to 15 percent, severe if more than 15 percent.
Slight	Moderate if slope is less than 6 percent, severe if more than 6 percent.	Severe: poor to fair subgrade material.	Moderate to severe: fair traffic supporting capacity; high shrink swell in lower subsoil.	Slight: topography generally favorable to dam-type ponds.	Moderate to severe: fair shear strength; medium to high compressibility; high shrink swell in lower subsoil.
Slight if slope is less than 8 percent, moderate if 8 to 15 percent.	Slight if slope is less than 2 percent, moderate if 2 to 6 percent, severe if more than 6 percent.	Moderate: fair subgrade material. Severe if slope is more than 8 percent.	Moderate: fair traffic supporting capacity.	Moderate: in places excess seepage; topography generally favorable for dam-type ponds.	Slight if slope is less than 6 percent, moderate if 6 to 15 percent.
Severe: severe wetness; poor trafficability; cracking; some areas flood.	Severe: severe wetness; poor trafficability; cracking; some areas flood.	Severe: severe wetness; poor subgrade material; difficult to work; some areas flood.	Severe: severe wetness; poor traffic supporting capacity; some areas flood; very high shrink swell.	Slight: topography generally too flat for dam-type pond.	Severe: poor shear strength; very high shrink swell; high compressibility; severe wetness; some areas flood.
Severe: moderate wetness; poor trafficability; cracking; some areas flood.	Severe: moderate wetness; poor trafficability; cracking; some areas flood.	Severe: moderate wetness; poor subgrade material; difficult to work; some areas flood.	Severe: moderate wetness; poor traffic supporting ing capacity; some areas flood; very high shrink swell.	Slight: topography generally too flat for dam-type pond.	Severe: moderate wetness; poor shear strength; very high shrink swell; high compressibility.
Slight	Slight if slope is less than 2 percent, moderate if 2 to 6 percent, severe if more than 6 percent.	Moderate: fair subgrade material.	Moderate: fair traffic supporting capacity.	Moderate: in places seepage from dugout; topography generally too flat for dam-type pond.	Moderate: fair shear strength; slight wetness.
Slight unless flooded. Moderate if subject to occasional flooding.	Slight if slope is less than 2 percent, moderate if more than 2 percent and subject to occasional flooding.	Moderate: fair subgrade material; some areas subject to occasional flooding.	Moderate: moderate traffic supporting capacity; some areas subject to occasional flooding.	Moderate: in places excess seepage from dugout.	Moderate: fair shear strength; medium compressibility.

TABLE 5.—*Engineering*

Soil and map symbols	Degree and kinds of limitations for—			
	Homesites	Septic tank filter fields	Sewage lagoons	Landscaping and gardening
Rosebloom Mapped only with Barclay and Guyton soils.	Very severe: subject to flooding; severe wetness.	Severe: severe wetness; subject to flooding; slow permeability.	Slight unless flooded. Severe if floodwaters are deep.	Severe: severe wetness; subject to flooding.
*Ruston; RsB, RsD, RsE, Ru, Ry For Lucy part of Ru and Ry, see Lucy series.	Slight if slope is less than 12 percent, moderate if more than 12 percent.	Slight if slope is less than 5 percent, moderate if 5 to 10 percent, severe if more than 10 percent.	Moderate: moderate permeability. Severe if slope is more than 7 percent.	Slight to moderate: low fertility. Severe if slope is more 12 percent.
Savannah: SaC	Slight	Severe: slow permeability; slight wetness.	Slight if slope is less than 2 percent, moderate if 2 to 7 percent.	Moderate: low fertility; slight wetness; moderate available water capacity.
Sterlington: StA, StB	Slight	Moderate: moderate permeability.	Moderate: moderate permeability; slope, if more than 2 percent.	Slight
Waller: Wa	Severe: severe wetness; some areas flood.	Severe: very slow permeability; severe wetness; some areas flood.	Moderate: fair embankment material.	Severe: low fertility; severe wetness; some areas flood.
Wrightsville: Wr	Severe: severe wetness; high shrink swell in subsoil; some areas flood.	Severe: very slow permeability; severe wetness; some areas flood.	Slight	Severe: severe wetness; moderately low fertility; some areas flood; clay subsoil.

interpretations, part I—Continued

Degree and kinds of limitations for—Continued					
Picnic areas and golf fairways	Playgrounds	Paved streets, airport runways, and parking areas	Highway location	Ponds and reservoir areas	Foundations for low buildings
Severe: severe wetness; subject to flooding.	Severe: severe wetness; subject to flooding.	Severe: wetness; subject to flooding; poor subgrade material.	Severe: severe wetness; subject to flooding.	Slight: topography too flat for dam-type pond.	Severe: severe wetness; subject to piping and flooding.
Slight if slope is less than 8 percent, moderate if 8 to 15 percent, severe if more than 15 percent.	Slight if slope is less than 2 percent, moderate if 2 to 6 percent, severe if more than 6 percent.	Slight if slope is less than 3 percent, moderate if 3 to 8 percent, severe if more than 8 percent.	Slight if slope is less than 6 percent, moderate if 6 to 15 percent, severe if more than 15 percent.	Moderate: in places seepage excessive, especially for dugout pond.	Slight if slope is less than 6 percent, moderate if 6 to 15 percent, severe if more than 15 percent.
Slight: slight wetness.	Moderate to slight: wetness; slope, if more than 2 percent.	Moderate to slight: wetness; fair subgrade material; slope, if more than 3 percent.	Moderate: fair traffic supporting capacity; slight wetness.	Moderate: some areas too flat for dam-type pond.	Moderate: slight wetness; fair shear strength.
Slight	Slight if slope is less than 2 percent, moderate if more than 2 percent.	Moderate: fair subgrade material.	Moderate: fair traffic supporting capacity.	Moderate: in places excessive seepage; topography generally too flat for dam-type pond.	Moderate: fair shear strength; medium compressibility; moderate piping potential.
Severe: severe wetness; some areas flood.	Severe: severe wetness; some areas flood; poor trafficability.	Severe: severe wetness; fair subgrade material; some areas flood.	Severe: severe wetness; some areas flood; poor traffic supporting capacity; poor stability of side slopes.	Slight: topography too flat for dam-type pond.	Severe: severe wetness; fair shear strength; subject to piping.
Severe: severe wetness; some areas flood.	Severe: severe wetness; some areas flood; poor trafficability.	Severe: severe wetness; poor subgrade material.	Severe: severe wetness; poor traffic supporting capacity; some areas flood; high shrink swell in subsoil.	Slight: topography generally too flat for dam-type pond.	Severe: severe wetness; poor shear strength; high compressibility; high shrink swell in subsoil.

TABLE 5.—*Engineering*

[An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or more kinds of soil. The soils for referring to other series that appear in the first column of this table. Made land and

Soil series and map symbols	Soil features affecting land grading or shaping	Suitability as a source of—		
		Highway subgrade material (road fill)	Road subbase material	Sand or gravel
*Alaga: Aa For Lucy part of Aa, see Lucy series.	Slope, if more than 3 percent; sandy texture; if dry, provides poor traction for equipment.	Good	Fair to poor	Sand good; gravel not suitable.
Alligator: Ac, Af	Severe wetness; very difficult to work; some areas flood.	Poor	Not suitable	Not suitable
*Barclay: Br For Rosebloom part of Br, see Rosebloom series.	Subject to severe flooding.	Fair	Fair	Fair for sand
Cadeville: Ca, CdE	Clay subsoil difficult to work; slope, if more than 3 percent.	Poor	0 to 7 inches poor; 7 to 48 inches not suitable.	Not suitable
Crowley: Cr	Moderate to severe wetness; clay subsoil difficult to work.	Poor	0 to 17 inches poor; 17 to 48 inches not suitable.	Not suitable
Frizzell: FrA, FrB	Moderate wetness; slope, if more than 3 percent.	Fair	0 to 35 inches poor; 35 to 56 inches not suitable.	Not available within depth of 56 inches.
Gallion: Ga	Slope, if more than 3 percent.	Fair	0 to 9 inches poor; 9 to 33 inches not suitable; 33 to 48 inches not suitable to poor.	Not suitable
*Guyton: Gu, Gy For Rosebloom part of Gy, see Rosebloom series.	Severe wetness limits working time; some areas flood.	0–23 inches fair; 23–60 inches poor.	0 to 23 inches poor; 23 to 70 inches not suitable.	Not suitable
*Hebert: Hb, HbB, He, HpB For Perry part of HpB, see Perry series.	Moderate wetness; some areas flood.	Fair	0 to 10 inches poor; 10 to 37 inches not suitable; 37 to 72 inches poor.	Not suitable
*Kirvin: Kr For Ruston part of Kr see Ruston series.	Slope if more than 3 percent; clayey subsoil somewhat difficult to work.	0 to 13 inches fair; 13 to 57 inches poor to fair.	0 to 13 inches poor; 13 to 57 inches not suitable to poor.	Not suitable
Leaf: Le	Severe: wetness; slope, if more than 3 percent; most areas flood; clayey subsoil.	0 to 6 inches fair; 6 to 48 inches poor.	0 to 6 inches poor; 6 to 48 inches not suitable.	Not available within depth of 48 inches.
Lucy Mapped only with Alaga and Ruston soils.	Slope, if more than 3 percent.	0 to 28 inches good; 28 to 92 inches fair.	0 to 28 inches fair to poor; 28 to 92 inches not suitable.	Fair for sand 0 to 28 inches; not suitable for gravel.
Muskogee: MuC	Slope, if more than 3 percent; clayey subsoil difficult to work.	Fair	0 to 20 inches poor; 20 to 84 inches not suitable.	Not suitable
*Ora: OrD, OrE, Os For Savannah part of Os, see Savannah series.	Slope, if more than 3 percent.	Fair	Poor to not suitable	Not suitable
Perry: Pc, Pe	Severe: wetness; very difficult to work; some areas flood.	Poor	Not suitable	Not suitable

interpretations, part II

in such mapping units may have different properties and limitations, and for this reason it is necessary to follow carefully the instructions
Terrace escarpments are variable and no valid estimate can be made. These soils are not listed]

Suitability as a source of—Continued				
Material for earth dams or leaves			Soil cement (base material)	Topsoil
Shell	Core	Homogeneous		
Fair	Poor to not suitable	Poor	Fair to good	Poor.
Poor	Good	Fair	Very poor to not suitable	Poor.
Fair	Fair	Fair	Good to fair	Good to fair.
0 to 7 inches fair; 7 to 54 inches poor.	0 to 7 inches fair; 7 to 54 inches good to fair.	Fair	0 to 7 inches fair; 7 to 54 inches very poor to not suitable.	0 to 7 inches fair; 7 to 54 inches very poor.
0 to 17 inches fair; 17 to 48 inches fair to poor.	0 to 17 inches fair; 17 to 48 inches good.	Fair	0 to 17 inches poor; 17 to 48 inches very poor.	Fair.
Fair	0 to 35 inches fair; 35 to 56 inches good.	Fair	0 to 35 inches fair; 35 to 56 inches very poor.	0 to 35 inches fair; 35 to 56 inches very poor.
Fair	0 to 9 inches fair; 9 to 33 inches good; 33 to 48 inches good to fair.	Fair	0 to 9 inches fair; 9 to 33 inches very poor; 33 to 48 inches very poor to poor.	Fair to good.
Fair	0 to 23 inches fair; 23 to 70 inches good to fair.	Fair	0 to 23 inches fair; 23 to 70 inches very poor to poor.	Fair.
Fair	0 to 10 inches fair; 10 to 37 inches good; 37 to 72 inches fair to good.	Fair	0 to 10 inches poor; 10 to 37 inches very poor; 37 to 72 inches poor to very poor.	Fair to good.
0 to 13 inches fair; 13 to 57 inches fair to poor.	0 to 13 inches fair; 13 to 57 inches good.	Fair	0 to 13 inches good to fair; 13 to 57 inches very poor.	0 to 13 inches fair; 13 to 57 inches very poor.
0 to 6 inches fair; 6 to 48 inches poor.	0 to 6 inches fair; 6 to 48 inches good.	Fair	Poor to very poor	0 to 6 inches poor; 6 to 48 inches very poor.
0 to 28 inches fair; 28 to 92 inches good to fair.	0 to 28 inches fair; 28 to 92 inches good.	0 to 28 inches fair; 28 to 92 inches good to fair.	0 to 28 inches good; 28 to 92 inches poor to very poor.	Poor.
Fair to poor	0 to 20 inches fair; 20 to 84 inches good.	Fair	0 to 20 inches fair; 20 to 84 inches very poor.	0 to 20 inches fair; 20 to 84 inches poor.
Fair	0 to 13 inches fair; 13 to 60 inches good.	Fair	0 to 13 inches fair to good; 13 to 60 inches very poor.	Fair.
Poor	Good	Fair	Very poor to not suitable	Poor.

TABLE 5.—*Engineering*

Soil series and map symbols	Soil features affecting land grading or shaping	Suitability as a source of—		
		Highway subgrade material (road fill)	Road subbase material	Sand or gravel
Portland: Po, Pr	Moderate: wetness; difficult to work; some areas flood.	0 to 9 inches fair to poor; 9 to 47 inches poor.	0 to 9 inches poor to not suitable; 9 to 47 inches not suitable.	Not suitable
Providence: PvB, PvC	Slope, if more than 3 percent.	Fair	0 to 10 inches poor; 10 to 54 inches not suitable to poor.	Not available within depth of 54 inches.
*Rilla: RlA, RlB, RmB. For Hebert part of RmB, see Hebert series.	Slope, if more than 3 percent.	Fair	0 to 8 inches poor; 8 to 69 inches not suitable to poor.	Not suitable
Rosebloom. Mapped only with Barclay and Guyton soils.	Severe wetness; subject to flooding.	0 to 8 inches fair; 8 to 60 inches poor.	0 to 8 inches poor; 8 to 60 inches not suitable.	Not suitable
*Ruston: RsB, RsD, RsE, Ru, Ry. For Lucy part of Ru and Ry, see Lucy series.	Slope, if more than 3 percent.	0 to 14 inches good; 14 to 48 inches fair.	0 to 12 inches poor to fair; 14 to 42 inches not suitable; 42 to 90 inches not suitable to poor.	Not available within depth of 90 inches.
Savannah: SaC	Slight wetness; slope, if more than 3 percent.	Fair	0 to 8 inches poor; 8 to 62 inches poor to not suitable.	Not suitable
Sterlington: StA, StB	Slope, if more than 3 percent.	Fair	Poor	Poor: in a few places loamy fine sand available below depth of 60 inches.
Waller: Wa	Severe wetness; some areas flood.	Fair	Poor to not suitable	Not available within depth of 80 inches.
Wrightsville: Wr	Severe wetness; some areas flood; difficult to work.	0 to 16 inches fair; 16 to 48 inches poor.	0 to 16 inches poor to not suitable; 16 to 48 inches not suitable.	Not suitable

interpretations, part II—Continued

Suitability as a source of—Continued				
Material for earth dams or leaves			Soil cement (base material)	Topsoil
Shell	Core	Homogeneous		
0 to 9 inches fair to poor; 9 to 47 inches poor.	0 to 9 inches fair to good; 9 to 47 inches good.	Fair	0 to 9 inches poor to not suitable; 9 to 47 inches very poor to not suitable.	0 to 9 inches good to poor; 9 to 47 inches poor.
Fair	0 to 10 inches fair; 10 to 54 inches good.	Fair	Poor to very poor	Fair.
Fair	0 to 8 inches fair; 8 to 69 inches good.	Fair	Poor to very poor	Fair to good.
Fair	Fair	Fair	0 to 8 inches poor; 8 to 60 inches very poor.	Fair.
0 to 14 inches fair; 14 to 90 inches good to fair.	0 to 14 inches fair; 14 to 42 inches good; 42 to 90 inches good to fair.	0 to 14 inches fair; 14 to 90 inches good to fair.	0 to 14 inches good to fair; 14 to 42 inches poor to very poor; 42 to 90 inches poor to fair.	Fair.
Fair	0 to 9 inches fair; 9 to 62 inches fair to good.	Fair	0 to 9 inches fair; 9 to 62 inches poor to very poor.	0 to 9 inches fair; 9 to 62 inches poor.
Fair	Fair	Fair	Poor	Good.
Poor	Poor	Poor	Poor to very poor	Poor.
0 to 16 inches fair; 16 to 48 inches poor to fair.	0 to 16 inches fair; 16 to 48 inches good.	Fair	0 to 16 inches poor to very poor; 16 to 48 inches very poor to not suitable.	0 to 16 inches poor; 16 to 48 inches very poor.

Soil properties significant in engineering

Table 4 lists estimates of properties for each mapping unit delineated on the soil map at the back of this publication. These estimates were based on the results of laboratory tests shown in table 3, on tests made of similar soils in adjacent parishes, on field observations, and on the behavior of the soils in this parish. A detailed description of each mapping unit and information about the range in characteristics and the inclusion of other soils can be found in the section "Descriptions of the Soils." The column headings in table 4 that were not explained in the discussion of table 3 are explained in the following paragraphs.

Reaction refers to the degree of acidity or alkalinity of a soil. It is more completely defined in the Glossary.

Permeability refers to the rate at which water moves through an undisturbed soil. The estimates were based on the structure and porosity of the soils and on permeability tests of undisturbed cores of similar soils. Permeability of the underlying material in a soil controls the rate of seepage and is the major soil feature to be considered in locating sites for ponds and reservoirs. Permeable soils, such as Ruston fine sandy loam, generally are not suitable unless they are treated to reduce seepage.

Available water capacity, also termed available moisture capacity, is 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 capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil.

Shrink-swell potential indicates the volume change to be expected when the moisture content of a soil changes. Much damage to building foundations, roads, and other structures is caused by the shrinking and swelling of soils as a result of alternate wetting and drying. This quality depends on the physical properties or characteristics of the soil. Perry clay, for example, has a very high shrink-swell potential. This soil is high in content of montmorillonitic clay and is very sticky when wet and cracks extensively as it dries. In contrast, Ruston fine sandy loam is low in clay content and has a low shrink-swell potential.

Wetness hazard refers to estimates of the length of time that free water stays in a soil after the saturation point has been reached. A rating of *none* indicates that free water stays in the soil less than 3 days; *slight*, 3 days to 1 month; *moderate*, 1 month to 3 months; and *severe*, 3 months to 6 months.

Flooding hazard refers to the risk of flooding as a result of stream overflow, runoff from adjacent areas, or local accumulation. Since the soils affected and the depth and duration of floods vary according to the severity of each rainstorm, the ratings shown in table 4 for flooding hazard are only for general guidance. Local records should be consulted for a more accurate estimate of the flooding hazard for any particular soil. The levee system along the Ouachita River protects certain lands from river overflow, but accumulations of local water can cause flooding on some of these lands. Interpretations on soils protected by the levee system are based on the satisfactory performance of the levee system.

Flooding hazard is none to slight for soils that are not subject to flooding or that are flooded less than once in 15 years. The hazard is moderate if the soil is flooded at least once in 15 years and severe if the soil is flooded one or more times each year.

Corrosion potential refers to the risk of corrosion of uncoated steel and concrete as a result of physical and biochemical action. Among the factors that cause corrosion are moisture, soluble salts, electrical conductivity, acidity, texture, and drainage.

Engineering interpretations

In table 5 part I, the soils of this parish are rated according to degrees of limitation for their use as residential and recreational areas, paved streets, landing strips for airplanes, parking areas, highway location, pond reservoir areas, and foundations for low buildings. Table 5 part II lists the features that affect land grading or shaping and also rates the suitability of the soils as a source of various construction material.

Considered in rating limitations affecting selection of homesites were bearing capacity, shrink-swell potential, wetness, flooding hazard, and slope.

Permeability, wetness, flooding hazard, and slope were considered in rating limitations for use of the soils as septic tank filter fields.

Slope, quality of embankment material, permeability, and flooding hazard were considered in rating limitations for use of the soils as sewage lagoons.

Flooding hazard, wetness, texture, available water capacity, natural fertility, reaction, and slope were considered in rating limitations affecting landscaping and gardening.

Wetness, flooding hazard, trafficability, soil cracking, difficulty in establishing sod, and slope were considered in rating limitations for use of the soils as picnic areas, playgrounds, and golf fairways.

Slope, quality of subgrade material, workability, flooding hazard, and wetness were considered in rating limitations for paved streets, airport runways, and parking areas.

Slope, wetness, traffic-supporting capacity, flooding hazard, shrink-swell potential, and slope stability were considered in rating limitations for highway location.

Seepage rate and topography were considered in rating limitations that affect selection of pond reservoir areas.

Shear strength, shrink-swell potential, compressibility, wetness, piping potential, and flooding were considered in rating limitations affecting design of foundations for low buildings.

A *slight* limitation is one that is easy to tolerate or overcome. A *moderate* limitation is one that needs to be recognized but can be tolerated or overcome by practicable means. A *severe* limitation is one that is undesirable or difficult or costly to overcome. A *very severe* limitation is one that is so restrictive that use of the soil for the particular purpose listed generally is not practicable.

In determining the ratings in table 5 part II, wetness, slope, flooding hazard, and workability were considered as soil features affecting grading and shaping.

The suitability of a soil for use as material for subgrade, or road fill, depends largely on the texture and the natural water content. Very plastic soils that are high in natural water content are difficult to handle, to dry, and to compact. For example, Perry clay and Portland

clay have a high shrink-swell potential and are rated very poor.

Only nonplastic soils, such as Ruston fine sandy loam, Ora fine sandy loam, and Lucy loamy fine sand, are suitable sources of road subbase material. If Providence silt loam, Sterlington silt loam, Rilla silt loam, Gallion silt loam, and other soils have layers that have a plasticity index of less than 15, they can be made suitable sources of road subbase material by the use of additives.

The rating of a soil as a source of sand and gravel is based on knowledge of the soils and on laboratory test data.

Farm pond embankments (dams) or levees are constructed with soil material that is homogeneous or with a "core" of impervious material and a "shell" of less desirable material. These three uses of soil material have different property requirements and therefore received different weight in classifying soil material. The rating criteria were based on rolled earthen dams or levees. Embankment criteria as related to the Unified classification system were used to classify soil material good, fair, or poor. The factors considered were shear strength, compaction characteristics, permeability (when compacted), compressibility (compacted and saturated), resistance to piping, and workability as construction material. Permeability was not considered for "shell." The degrees of limitations are based on a weighted average of the effect that the various soil properties of each Unified class has on the desirability of soil material for use in embankments.

For the core the soil material must be relatively impervious when placed and compacted in the center part of the embankment. It may or may not be good for other parts of the embankment.

For the shell the soil material must have sheer strength and stability. It does not need to be impervious but may be good for other parts of the dam.

If homogeneous soil material is used, it must have adequate shear strength and stability, resistance to erosion, and relative imperviousness.

Soil cement (base material) is mixed with cement for highway subbase and slope protection against wave action on dams and other embankments exposed to wave action. Suitability ratings are based on percent of cement needed to produce soil cement that will withstand many freeze-thaw and wet-dry cycles without deterioration. Generally, a well graded silty sand that has less than 35 percent passing the number 200 sieve is the best. Soils that have a high clay content are less desirable.

The soils that are rated good as a source of topsoil material respond well to management for establishing and maintaining good turf. These soils normally have a thick layer of loamy material and are fairly high in organic-matter content. Soils that have a thin or clayey surface or a seasonal high water table are rated poor as a source of topsoil material.

Good construction materials are not very well distributed throughout Ouachita Parish. Suitable subbase material is generally limited to small areas underlying the Rilla, Hebert, and Sterlington soils, along the Ouachita River, and to a few soils in the western part of the parish. Some sand and chert gravel deposits are under the terrace soils along the west side of the Ouachita River and in small areas in the northeastern part of the parish. These limited deposits occur under the Guyton, Providence, Ruston, and Frizzell soils. A limited amount of ironstone gravel is available in and underlying the Kirvin soils in the northwestern part of the parish.

Most farm ponds are in the western part of the parish. They were constructed by building dams across natural drains. The dams were made of soil material from the adjacent hills. On the smooth or depressional soils, ponds are constructed by excavation.

Use of the Soils for Woodland [6]

This section contains information concerning the relationship between soils and trees and between soils and forage plants. It includes interpretations that make the soil survey more useful to woodland owners and operators in developing plans for establishing and harvesting trees and forage plants.

A virgin forest covered all of Ouachita Parish except small areas along Prairie Road in the southwestern part of the parish. Principal commercial trees on bottom lands were bottom land oaks, sweetgum, cypress, cottonwood, sycamore, ash, and pecan. On soils of the terraces and Coastal Plain uplands, there were loblolly pine, shortleaf pine, red oak, white oak, sweetgum, and hickory. Slash pine has been introduced by planting (fig. 10).

About two-thirds of the total land area of Ouachita Parish is now woodland.

Production of wood crops

The soils of Ouachita Parish have been rated on the basis of their performance when used to produce wood crops. The ratings are based on pertinent research, measurements by foresters and soil scientists, and experience of woodland managers. These ratings are a means of expressing information useful in managing woodland.

In table 6 the soils of the parish are grouped according to their suitability for trees. Made land and Terrace escarpments were not grouped because they are too variable. In the first column of table 6, the woodland groups are rated for erosion hazard, equipment limitations, and seedling mortality. Also shown in table 6 are site indexes for specified trees, species suitable for planting, principal forage plants, and the estimated forage yield where the woodland is open, spare, medium, dense.

Erosion hazard was rated slight, moderate, or severe. The ratings assigned to each soil were based on the erodibility of the soil, the steepness of slope, and the soil depth.

Equipment limitations are soil characteristics and topographic features that restrict or prohibit the use of conventional equipment for road construction, the control of unwanted vegetation, the harvesting of wood products, or the control of fires. Limiting factors are wetness and texture of the surface layer, duration of floods, and steepness of slope. A mapping unit is rated *slight* if conventional equipment can be used at any time of the year except for short periods of heavy rainfall and the soils

[6] H. FORD FALLIN, woodland conservationist, and ALTON T. WILHITE, range conservationist, both Soil Conservation Service, assisted in preparing this section. Much of the soil-tree site data was obtained in a cooperative study by the U.S. Forest Service and the Soil Conservation Service.

Figure 10.—**Slash pine plantation on Ruston fine sandy loam, 1 to 3 percent slopes. Excellent survival.**

are excessively drained to moderately well drained, are not subject to flooding or excessive surface water, and have slopes less than 15 percent. Limitations are *moderate* if conventional equipment can be used from March to December, flooding is only occasional, the water table is generally below the surface and is seldom above the surface for extended periods, the surface layer is deep and sandy, and slopes are more than 10 percent. Limitations are *severe* if use of conventional equipment is limited to the driest months or between periods of flooding and the surface layer is deep and sandy on slopes of more than 25 percent. On these slopes equipment works best during periods of high moisture content.

Seedling mortality refers to expected mortality of tree seedlings of preferred species established by planting, direct seeding, or natural seeding. Soil texture, available water capacity, depth, and duration of flooding are the primary factors that affect seedling mortality in Ouachita Parish. The rating is *slight* if average mortality is not expected to exceed 25 percent, *moderate* if mortality is expected to average 25 to 50 percent, and *severe* if mortality is expected to exceed 50 percent.

The ratings of individual soils provide a basis for grouping them according to their suitability for woodland use and management. The groupings simplify the presentation of information. A woodland suitability group consists of soils that have comparable potential productivity and comparable hazards to use, that produce similar tree crops, and that require similar management. In grazable woodland, the soils in a woodland group produce similar forage plants if management is similar.

TABLE 6.—*Woodland groups, wood crops, and woodland forage*

Woodland group, map symbols, and description of soils	Potential productivity		Preferred species for planting	Understory vegetation utilized as forage	
	Important species	Site index		Principal plants	Estimated yields by canopy classes, in pounds air-dry forage per acre
Group 2o1.—High potential productivity; no serious limitations; soils best suited to southern pines. RsB, RsD, RsE, and Ruston part of Kr, Ru, and Ry. For Lucy part of Ru and Ry see group 3s2; for Kirvin part of Kr, see group 3o7.	Loblolly pine Shortleaf pine	90 80	Loblolly pine.	Pinehill bluestem, purpletop, big bluestem, Florida paspalum, beaked panicum, uniola, low panicum, three-awn, carpetgrass, tickclover, smilax, rushes, and sedges. Common invaders: Broomsedge, yankeeweed, annuals.	Open canopy 4,000; sparse 3,100; medium 1,200; dense 500.
Group 2o4.—High potential productivity; no serious limitations; soils best suited to southern hardwoods. Ga, RlA, RlB, StA, StB, and Rilla part of RmB. For Hebert part of RmB, see group 2w5.	Green ash White ash Cottonwood American elm Slippery elm Hackberry Sugarberry Hickories Cherrybark oak Nuttall oak Shumard oak Swamp chestnut oak. Water oak White oak Willow oak Pecan Sweetgum Sycamore Black tupelo Yellow-poplar	80 --- 100 --- --- --- --- --- 90 90 --- --- 90 --- 90 --- 90 --- --- ---	Green ash, cottonwood, Nuttall oak, Shumard oak, swamp chestnut oak, water oak, willow oak, sweetgum, sycamore, yellow-poplar, loblolly pine.	(1)	(1).
Group 2o7.—High potential productivity; no serious limitations; soils well suited to southern hardwoods and pine. PvB, PvC, and Providence part of Os. For Ora and Savannah parts of Os, see group 3o7.	Black cherry Hickories (except water). Cherrybark oak Southern red oak Water oak White oak Willow oak Loblolly pine Slash pine Sweetgum American sycamore. Black tupelo Black walnut Yellow-poplar	--- --- 80 --- 90 --- 90 90 90 90 --- --- --- ---	Loblolly pine, slash pine. On uneroded sites only: cherrybark oak, Shumard oak, swamp chestnut oak, water oak, yellow-poplar.	Pinehill bluestem, purpletop, Florida paspalum, uniola, beaked panicum, three-awn, low panicums, carpetgrass, smilax. Common invaders: Broomsedge, annuals.	Open canopy 3,500; sparse 2,400; medium 1,300; dense 800.

See footnote at end of table.

TABLE 6.—*Woodland groups, wood crops, and woodland forage*—Continued

Woodland group, map symbols, and description of soils	Potential productivity		Preferred species for planting	Understory vegetation utilized as forage	
	Important species	Site index		Principal plants	Estimated yields by canopy classes, in pounds air-dry forage per acre
Group 2w5.—High potential productivity; moderate equipment limitations; slight to moderate seedling mortality mainly because of excess water; soils best suited to southern hardwoods. Hb, HbB, He, Barclay part of Br, and Hebert part of HpB and RmB. For Rosebloom part of Br, see group 2w9; for Perry part of HpB, see group 2w6; for Rilla part of RmB, see group 2o4.	Green ash Cottonwood American elm Slippery elm Hackberry Sugarberry Honeylocust Red maple Cherrybark oak Nuttall oak Overcup oak Shumard oak Swamp chestnut oak. Water oak White oak Willow oak Pecan Persimmon Sweetgum Sycamore Black tupelo Yellow-poplar	80 110 --- --- --- --- --- --- 90 90 --- --- --- 90 --- 100 --- --- 90 --- --- ---	Green ash, cottonwood, cherrybark oak, Nuttall oak, Shumard oak, swamp chestnut oak, water oak, willow oak, sweetgum, sycamore, yellow-poplar.	(1)	(1).
Group 2w6.—High potential productivity; severe equipment limitations; moderate seedling mortality mainly because of excess water; best suited to southern hardwoods. Ac, Pe, Po, Pr, and Perry part of HpB. For Hebert part of HpB, see group 2w5.	Green ash Baldcypress Cottonwood American elm Slippery elm Hackberry Sugarberry Water hickory Honeylocust Red maple Cherrybark oak Nuttall oak Overcup oak Shumard oak Swamp chestnut oak. Water oak Willow oak Pecan Persimmon Sassafras Sweetgum Sycamore Black tupelo Water tupelo Black willow Yellow-poplar	80 --- 100 --- --- --- --- --- --- --- 90 90 --- --- --- 90 90 --- --- --- 90 --- --- --- --- ---	Green ash, baldcypress, cottonwood, cherrybark oak, Nuttall oak, Shumard oak, swamp chestnut oak, water oak, willow oak, sweetgum, sycamore.	(1)	(1).
Group 2w8.—High potential productivity; moderate equipment limitations mainly because of excess water; soils well suited to southern hardwoods and pine. FrA, FrB.	Green ash Hackberry Cherrybark oak Laurel oak Nuttall oak Overcup oak Water oak White oak Willow oak Common persimmon. Loblolly pine Sweetgum	--- --- 90 --- --- --- 90 --- 90 --- 90 90	Green ash, cherrybark oak, Nuttall oak, Shumard oak, water oak, willow oak, sweetgum, American sycamore, loblolly pine, yellow-poplar.	Pinehill bluestem, switchgrass, indiangrass, beaked panicum, low panicum, uniola, carpetgrass, swamp sunflower, tickclover. Common invaders: Waxmyrtle, broomsedge, annuals.	Open canopy 4,500; sparse 3,500; medium 1,800; dense 800.

See footnote at end of table.

TABLE 6.—*Woodland groups, wood crops, and woodland forage*—Continued

Woodland group, map symbols, and description of soils	Potential productivity		Preferred species for planting	Understory vegetation utilized as forage	
	Important species	Site index		Principal plants	Estimated yields by canopy classes, in pounds air-dry forage per acre
Group 2w9.—High potential productivity; severe equipment limitations; moderate to severe seedling mortality mainly because of excess water; soils well suited to southern hardwoods and pine. Gu, Gy, Le, Wa, and Rosebloom part of Br. For Barclay part of Br, see group 2w5.	Green ash Cottonwood Red oak Water oak White oak Loblolly pine Sweetgum Sycamore Tupelo	------ 90–100 ------ ------ ------ 90+ 90 ------ ------	Cottonwood, Nuttall oak, Shumard oak, loblolly pine, sweetgum, sycamore.	Pinehill bluestem, chalky bluestem, silver plumgrass, switchgrass, toothachegrass, Florida paspalum, carpetgrass, lespedeza, swamp sunflower, smilax. Common invaders: Wax-myrtle, broomsedge, annuals.	Open canopy 4,300; sparse 3,200; medium 1,600; dense 600.
Group 3c2.—Moderately high potential productivity; slight to moderate erosion hazard; moderate equipment limitations because of clay subsoil; soils best suited to southern pines. CdE and Cadeville parts of Ca, Kr, and Os. For Kirvin part of Kr, Ora and Savannah parts of Os, see group 3o7; for Ruston part of Kr, see group 2o1.	Loblolly pine Shortleaf pine	80 70	Loblolly pine.	Pinehill bluestem, indiangrass, beaked panicum, uniola, low panicums, three-awn, carpetgrass, tickclover.	Open canopy 3,600; sparse 2,600; medium 1,400; dense 900.
Group 3o7.—Moderately high potential productivity; no serious limitations; soils best suited to southern hardwoods and pines. MuC, OrD, OrE, SaC, Kirvin and Ora parts of Ca and Kr, Ora and Savannah parts of Os and Ru, and Ora part of Ry. For Cadeville part of Ca, see group 3c2; for Lucy part of Ru and Ry, see group 3s2; for Ruston part of Ru and Ry, see group 2o1.	Loblolly pine Shortleaf pine	80 70	Loblolly pine.	Pinehill bluestem, purpletop, big bluestem, Florida paspalum, beaked panicum, uniola, low panicums, three-awn, carpetgrass, smilax. Common invaders: Broomsedge, annuals.	Open canopy 3,600; sparse 2,500; medium 1,400; dense 800.
Group 3s2.—Sandy surface; moderately high potential productivity; moderate equipment restrictions; moderate seedling mortality; soils best suited to southern pine. Lucy parts of Aa, Ru, and Ry. For Alaga part of Aa, see group 3s3; for Ruston part of Ru and Ry, see group 2o1.	Loblolly pine Shortleaf pine	80 70	Loblolly pine.	Pinehill bluestem, big bluestem, purpletop, uniola, low panicums, three-awn, dropseeds, paspalums, tickclover, snoutbean, tephrosia. Common invaders: Yankeeweed, bull nettle, broomsedge, annuals.	Open canopy 3,200; sparse 2,400; medium 1,200; dense 500.
Group 3s3.—Moderately high potential productivity; slight to moderate erosion hazard; equipment limitations; severe seedling mortality; soils best suited to southern pine. Alaga parts of Aa and Ry. For Lucy parts of Aa and Ry, see group 3s2; for Ruston part of Ry, see group 2o1.	Loblolly pine Shortleaf pine	80 70	Loblolly pine.	Pinehill bluestem, big bluestem, purpletop, uniola, low panicums, three-awn, dropseeds, paspalums, tickclover snoutbean, tephrosia. Common invaders: Yankeeweed, bull nettle, broomsedge, annuals.	Open canopy 3,200; sparse 2,300; medium 1,100; dense 500.

See footnote at end of table.

TABLE 6.—*Woodland groups, wood crops, and woodland forage*—Continued

Woodland group, map symbols, and description of soils	Potential productivity		Preferred species for planting	Understory vegetation utilized as forage	
	Important species	Site index		Principal plants	Estimated yields by canopy classes, in pounds air-dry forage per acre
Group 3w6.—Moderately high potential productivity; severe equipment limitations; severe seedling mortality mainly because of excess water; soils best suited to southern hardwoods. Af, Pc.	Green ash Baldcypress Cottonwood American elm Slippery elm Hackberry Sugarberry Water hickory Honeylocust Red maple Cherrybark oak Nuttall oak Overcup oak Swamp chestnut oak. Water oak Willow oak Persimmon Sweetgum Sycamore Water tupelo Black willow	70 90 80 80 80 80 80 	Green ash, baldcypress, cottonwood, Nuttall oak, sweetgum.	[1]	[1].
Group 3w9.—Moderately high potential productivity; severe equipment limitations; moderate seedling mortality mainly because of excess water; soils best suited to southern hardwoods and pine. Cr, Wr.	Red oak Water oak White oak Loblolly pine Sweetgum	 80 80 80	Loblolly pine, sweetgum.	Pinehill bluestem, chalky bluestem, silver plumgrass, switchgrass, toothachegrass, Florida paspalum, carpetgrass, lespedeza, swamp sunflower, smilax. Common invaders: Waxmyrtle, broomsedge, annuals.	Open canopy 4,300; sparse 3,200; medium 1,600; dense 600.

[1] Grazing is not recommended.

Each group symbol consists of three parts. The first, an Arabic number, indicates the relative productive potential of wood crops for the soils in the group. It expresses the site quality based on the site class of one or more important forest types or species. The number 1 indicates that productive potential is very high; 2, high; 3, moderately high; 4, moderate; and 5, low.

The second part of the symbol, a small letter, indicates the soil or physiographic characteristic that is the primary cause of hazards, limitations, or restrictions that affect woodland use and management. The letter *w* indicates excessive wetness; *c*, restrictions or limitations for woodland use because of the kind or amount of clay in the upper part of the soil profile; and *s*, limitations that are primarily caused by the amount of sandy material in the soil profile. The letter *o* indicates that there are no significant soil-related limitations for woodland use.

The third element in the symbol indicates the degree of hazards or limitations, and the general suitability of the soils for certain kinds of trees. The management problems considered are erosion hazard, equipment limitations, and seedling mortality. The number 1 indicates no hazard or only slight hazards; 2 indicates one or more moderate hazards; and 3, one or more severe hazards. Soils in woodland groups having 1, 2, or 3 as the last part of the symbol are best suited to pines. The number 4 indicates no hazard or only slight hazards; 5, one or more moderate hazards to use; and 6, one or more severe hazards. Soils in woodland groups having 4, 5, or 6 as the last part of the symbol are best suited to hardwoods. The number 7 indicates no hazard or only slight hazards; 8 indicates one or more moderate hazards; and 9, one or more severe hazards. Soils in woodland groups having 7, 8, or 9 as the last part of the symbol are suited to both pines and hardwoods. The number 0 indicates soils that are not suited to trees grown commercially.

The woodland suitability group to which each mapping unit is assigned can be determined by referring to the "Guide to Mapping Units" at the back of this survey.

Production of forage in woodland

The kind and amount of understory vegetation that can be produced in an area is related to the soils, climate, and amount of tree overstory. In many woodlands, grazing by cattle can be a compatible secondary use. The grasses, legumes, forbs, and many of the woody browse plants in the understory can be grazed by cattle if management is good. In this way, a woodland enterprise is supplemented without damage to the trees. Grazing is beneficial, except in young plantations where trampling and browsing kill some of the seedlings in pine woodland. Grazing reduces the accumulation of debris and thus reduces the hazard of wildfires. Grazing also helps in the suppression of undesirable woody plants.

The success of a combined woodland and livestock program depends primarily on the degree and time that forage plants are grazed. Intensity of grazing must be such that adequate cover is maintained for soil protection, the quantity and quality of forage vegetation are maintained or improved, and trees are not seriously damaged.

Forage production varies according to the type of woodland and the amount of sunlight that reaches the understory vegetation during the growing season.

The soils in a woodland suitability group have the potential for producing about the same kind and amount of understory vegetation. This potential understory vegetation is the vegetation that originally grew under the trees. It is generally the most productive and most suitable vegetative community for the soils, and it reproduces itself as long as the environment does not change. These forage species are called decreasers, increasers, and invaders.

Decreasers are those species in the climax vegetation that tend to decrease in relative amounts under heavy grazing. They are generally the most productive and palatable perennial grasses and forbs growing on the soils. Climax vegetation consists of the kinds and amounts of plants that originally grew on the site.

Increasers are those species in the climax vegetation that increase in relative amount as the most desirable plants are reduced by overgrazing. They are commonly shorter and less palatable than decreasers.

Invaders are plants that are not part of the climax vegetation. These plants invade the plant community as a result of heavy overgrazing or other disturbances. Many are annual weeds, some are shrubs that have some grazing value, but others have little value for grazing.

The relationship is close between the total potential yield of grasses, legumes, and forbs in a woodland suitability group and the amount of sunlight reaching the ground at midday in the forest. Herbage declines as the forest canopy becomes denser. For this reason, the percentage of tree canopy is used to reflect the effect that a particular age and density of trees has on the potential production of the understory vegetation of the soils. Four canopy classes are used to reflect the differences in forage production. They are open, sparse, medium, and dense.

Canopy is *open* where less than 20 percent of the understory vegetation is shaded at midday, *sparse* where 21 to 35 percent is shaded, *medium* where 36 to 55 percent is shaded, and *dense* where more than 56 percent is shaded.

Forage condition classes are used to indicate the degree of departure from the climax understory vegetation that has been brought about by grazing or other uses. These classes show the present condition of the vegetation in relation to vegetation that could grow there.

A grazable woodland is in *excellent condition* if 76 percent or more of the present vegetation is of the same kind as the principal forage plants. It is in *good condition* if the percentage is between 51 and 75 percent, in *fair condition* if the percentage is between 26 and 50 percent, and in *poor condition* if the present percentage is less than 25.

Potential forage production depends on the woodland suitability group and canopy class. Current forage production depends on the forage condition class and the moisture that the plants get during their growth season.

One of the main objectives in good woodland grazing management is to keep the woodland forage in excellent or good condition. If this is done, water is conserved, yields are improved, and the soils are protected.

The principal forage species listed in each woodland suitability group in table 6 are those that are climax for the group. The forage production shown for each woodland suitability group is the production that can be expected in normal years when the woodland is good condition and the canopy is medium or less.

Wildlife [7]

Ouachita Parish has a large population of game animals and fish. Deer are in large to moderate numbers. Squirrels are in large numbers throughout most of the parish. Their number depends on the mast available. Quail are in small to moderate numbers. They are most numerous around cleared land in the northern and western parts of the parish. Rabbits are in large numbers in most places. Swamp rabbits are most numerous in the eastern part of the parish, and cottontails are most numerous in the uplands. Doves are in large numbers in winter. Turkeys are being established in the Russell Sage Game Management Area and on one tract of company-owned land. Ducks are moderately numerous, and geese are scarce. Ducks and geese require large bodies of water or flooded swampland. Mink, muskrat, and nutria are few, and raccoon are in large numbers.

The extensive clearing of woodland on the flood plains is changing the wildlife habitat. The deer, squirrels, and swamp rabbits are being replaced by quail, cottontail rabbits, and doves.

The Russell Sage Game Management Area, administered by the Louisiana Wildlife and Fisheries Commission, has 13,875 acres of hardwoods on bottom land in the eastern part of the parish. Wham Brake, owned by a paper company, also is managed by the Wildlife and Fisheries Commission. It is in the northeastern part of the parish and extends into Morehouse Parish. It is managed mainly for ducks.

Impoundments in Ouachita Parish include Bayou De Siard (1,251 acres), Cheniere Brake (3,115 acres), Black Bayou Lake (2,000 acres), and Bartholomew Lake (400 acres). These lakes provide excellent fishing for large-

[7] RAY SMITH, JR., biologist, Soil Conservation Service, assisted in preparing this section.

mouth bass, black crappie, red-ear sunfish, bluegills, and channel catfish. They are also resting places for waterfowl.

The wildlife population of any area depends upon the availability of food, cover, and water in a suitable combination. Habitat is created, improved, or maintained by establishing desirable vegetation and developing water supplies in suitable places.

In table 7 the soils in Ouachita Parish are rated numerically according to their suitability for the elements of wildlife habitat and classes of wildlife. These ratings refer only to the suitability of the soil. They do not take into account the climate, the present use of the soil, or the distribution of wildlife and human populations. The suitability of individual sites should be determined by onsite inspection.

TABLE 7.—*Suitability for elements of wildlife habitat and kinds of wildlife*

[Numeral 1 means well suited, 2 means suited, 3 means poorly suited, and 4 means unsuited. Made land and Terrace escarpments are variable and are not listed. Onsite investigation is needed to determine suitability of these soils]

Soil and map symbol	Elements of wildlife habitat							Kinds of wildlife			
	Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Hardwood woody plants	Coniferous woody plants	Wetland food and cover plants	Shallow water developments	Ponds	Openland	Woodland	Wetland
Alaga: Aa	3	3	3	3	2	4	4	4	3	2	4
Alligator:											
Ac	3	2	2	2	3	1	1	1	3	1	1
Af	[1] 3	4	4	3	[2] 3	2	2	[3] 3	4	3	2
Barclay: Br	3	2	2	1	3	3	3	4	3	1	3
Cadeville:											
Ca	4	3	2	2	2	4	4	2	2	2	4
CdE	3	3	2	2	1	4	4	2	2	2	4
Crowley: Cr	2	2	2	2	2	3	1	1	2	2	2
Frizzell:											
FrA	2	2	2	1	1	2	2	2	2	1	3
FrB	2	2	2	1	1	3	3	2	2	1	3
Gallion: Ga	1	1	1	1	2	3	3	3	1	1	4
Guyton:											
Gu	3	2	2	1	1	1	1	1	3	1	1
Gy	[1] 3	4	2	1	1	2	2	2	3	1	2
Hebert:											
Hb	2	1	2	2	3	2	2	2	2	1	2
HbB	2	1	2	2	3	3	2	2	2	1	3
He	2	1	2	2	3	2	3	2	2	2	3
HpB	2	2	2	2	2	2	2	2	4	3	2
Kirvin: Kr	3	2	1	2	2	4	4	3	1	2	4
Leaf: Le	[1] 3	4	3	2	2	2	2	2	4	3	1
Muskogee: MuC	1	1	1	2	1	4	4	2	1	2	4
Ora:											
OrD	2	1	1	2	1	4	4	2	1	2	4
OrE	3	1	1	2	1	4	4	2	1	2	4
Os	2	1	1	2	1	4	4	2	1	2	4
Perry:											
Pc	[1] 3	4	4	3	[2] 3	2	1	[3] 3	4	3	2
Pe	2	2	3	2	4	1	1	[3] 3	2	1	1
Portland:											
Po	2	1	3	3	4	2	1	[3] 3	2	1	1
Pr	2	1	3	2	4	2	1	[3] 3	2	1	1
Providence:											
PvB	1	1	1	2	1	4	4	2	1	2	4
PvC	1	1	1	2	1	4	4	2	1	2	4

See footnotes at end of table.

TABLE 7.—*Suitability for elements of wildlife habitat and kinds of wildlife*—Continued

Soil and map symbol	Elements of wildlife habitat							Kind of wildlife			
	Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Hardwood woody plants	Coniferous woody plants	Wetland food and cover plants	Shallow water developments	Ponds	Openland	Woodland	Wetland
Rilla:											
RlA	1	1	1	1	2	3	3	3	1	1	4
RlB	1	1	1	1	2	3	3	3	1	1	4
RmB	2	1	2	1	3	2	3	2	1	1	4
Ruston:											
RsB	1	1	1	2	1	4	4	3	1	2	4
RsD	2	1	1	2	1	4	4	3	1	2	4
RsE	3	2	1	2	1	4	4	3	1	2	4
Ru	4	2	2	3	2	4	4	4	1	3	4
Ry	2	1	1	2	1	4	4	3	1	2	4
Savannah: SaC	1	1	1	2	1	4	4	2	1	2	4
Sterlington:											
StA	1	1	1	1	3	4	4	4	1	1	4
StB	1	1	1	1	3	4	4	4	1	1	4
Waller: Wa	3	2	2	1	1	1	1	1	3	1	1
Wrightsville: Wr	3	1	1	1	2	1	1	3	3	1	1

[1] Millets only. [2] Cypress site. [3] Restricted by muddiness.

The number 1 indicates that the soil is well suited. Habitat generally is easily created, improved, or maintained, the soil has a few or no limitations that affect management, and satisfactory results generally can be expected. The number 2 means that the soil is suited. Habitat can be created, improved, or maintained in most places, the soil has moderate limitations that affect management, and moderate intensity of management and fairly frequent attention are required for satisfactory results. The number 3 identifies a poorly suited soil. Habitat can be created, improved or maintained in most places, the soil has fairly severe limitations, habitat management is difficult and expensive and requires intensive effort, and results are not always satisfactory. The number 4 indicates that the soil is unsuited. It is impractical or impossible to create, improve, or maintain habitat, and unsatisfactory results are probable. The column headings in table 7 are explained in the following paragraphs.

Grain and seed crops refer to grain-producing or seed-producing annual plants, such as corn, sorghum, millet, and soybeans.

Grasses and legumes refer to domestic grasses and legumes that are planted and furnish food and cover for wildlife. The grasses include Pensacola bahiagrass, ryegrass, and panicgrasses. Legumes include clovers, annual lespedezas, and bush lespedeza.

Wild herbaceous upland plants refer to native or introduced perennial grasses, forbs, and weeds that provide food and cover for upland wildlife. Examples of these are beggarweed, perennial lespedeza, wild bean, pokeberry, blackberry, and dewberry.

Hardwood woody plants refer to nonconiferous trees, shrubs, and woody vines that produce fruits, nuts, buds, catkins, or foliage (browse) that provide food for wildlife. These plants commonly become established through natural processes, but they may be planted. They include oak, beech, hickory, dogwood, viburnum, tupelo, grape, honeysuckle, rattan, greenbrier, hawthorns, and French mulberry.

Coniferous woody plants are cone-bearing trees and shrubs that are used mainly as cover but may furnish food in the form of browse, seeds, or fruitlike cones. They become established through natural processes or can be planted. Included are pines, cedars, and cypress.

Wetland food and cover plants are annual and perennial wild herbaceous plants that grow on moist to wet sites, but they do not include submersed or floating aquatics. They furnish food or cover mostly for wetland wildlife. Some examples are smartweed, wild millet, spikerush and other rushes, sedges, arrowhead, and watershield.

Shallow water developments are low dikes and water control structures established to create habitat principally for waterfowl. They may be designed to be drained, planted, and flooded, or they may be used as permanent impoundments to grow submersed aquatics.

Ponds are located where water of suitable depth and quality can be impounded for fish production as one of the primary uses.

Openland wildlife are quail, doves, cottontail rabbit, fox, meadowlark, field sparrow, and other birds and mammals that normally live on cropland, pasture, meadow, lawn, and in other openland areas where grasses, herbs, and shrubby plants grow.

Woodland wildlife are woodcock, thrush, vireo, squirrel, deer, swamp rabbit, raccoon, wild turkey, and other birds and mammals that normally live in wooded areas where hardwood trees and shrubs and coniferous trees grow.

Wetland wildlife are ducks, geese, snipe, heron, nutria, mink, and other mammals and birds that normally live in wet areas, marshes, and swamps.

Formation and Classification of the Soils

This section describes the major factors of soil formation and tells how these factors have affected the soils of Ouachita Parish. It also explains some of the processes of soil formation and defines the current system for classifying soils.

Factors of Soil Formation

The characteristics of a soil at any given point are determined by the interaction of climate, plants and other living organisms, parent material, relief, and time. Each of these factors affects the formation of every soil, and each modifies the effects of the other four. The importance of the individual factors varies from place to place.

Climate and vegetation are the active factors that change parent material and gradually form soil. Relief modifies the effects of climate and vegetation, mainly by its influence on runoff and temperature. The nature of the parent material also affects the kind of soil that is formed. Time is needed for changing the parent material into soil. Generally, a long period is required for distinct soil horizons to develop.

The interactions among these factors are more complex for some soils than for others. In many places, for example, the environment has changed and the characteristics of a new soil have been superimposed on those of an ancient one.

In the following pages the five major factors of soil formation are described in relation to their effects on the soils of Ouachita Parish.

Climate

The climate in the parish is characterized by mild winters, warm summers, and abundant rainfall. Presumably, it is similar to the climate under which the soils formed. Climatic data for the parish are given in the section "General Nature of the Parish."

The warm, moist climate promotes rapid soil development. The warm temperatures permit rapid chemical reactions. Large amounts of water are available to move through the soil and remove dissolved or suspended materials. The remains of plants decompose rapidly, and the organic acids thus produced hasten development of clay materials and removal of carbonates. Leaching and soil development can continue almost the year round.

The climate is fairly uniform throughout the parish. Climate has had a strong influence on most soils in the parish, but it alone does not account for local differences among the soils.

Living organisms

Plants, animals, insects, bacteria, and fungi are important in the formation of soils. Among the changes they cause are gains in organic matter and nitrogen in the soil, gains or losses in plant nutrients, and changes in structure and porosity.

Plants generally have a greater effect on soil formation than other living organisms. In Ouachita Parish the native plants were dominantly hardwoods on bottom lands and pines on uplands. Because of the climate and the rapid decomposition of organic material, the soils that formed under trees generally are low in organic-matter content.

Near U. S. Highway No. 165 in the southern part of the parish, a few soils have a thick A horizon that is very dark grayish brown. These soils apparently formed under grass vegetation. Because of the small acreage they are included with Gallion silt loam. Crowley soils also formed under prairie vegetation. They are in the vicinity of Prairie Road in the southeastern part of the parish.

Relief

Relief, or the slope of the landscape, affects soil formation through its influence on drainage, erosion, plant cover, and soil temperature. The soils in Ouachita Parish range from level to steep.

The Guyton, Waller, Wrightsville and other grayish, poorly drained soils are level or depressional. In these places water stands or drains away slowly, the soils are saturated for long periods, and they are poorly aerated. This causes reduction of iron compounds and the formation of gray colors. Sloping soils have better drainage and aeration and have colors of red, yellow, or brown. The soils of the Providence, Frizzell, and Guyton series formed in similar parent materials, under similar climate, and have similar living organisms and age, but do not have similar relief. The Guyton soils are in depressions and have gray colors. The Frizzell soils are level or in slightly convex areas and have yellowish-brown colors mottled with gray. The Providence soils are gently sloping along natural drains and have brown and yellowish-red colors.

Relief has been responsible for the major differences in these soils. On steep slopes, relief seems to be the dominant factor affecting the thickness of the solum. In places some soil is removed by geologic erosion. The Kirvin and Cadeville soils are affected by relief in this way, but their solum thickness is 3 to 5 feet. There are no shallow soils on the steep slopes in Ouachita Parish.

Parent material

Parent material is the unconsolidated mineral mass from which soils form. The nature of the parent material affects the chemical and mineralogical composition of the soils. Also, it may influence the degree of leaching, the reaction, texture, permeability, drainage, and the kind and color of the A and B horizons. Textural differences in parent material are accompanied by differences in chemical and mineralogical composition. Sandy material is high in quartz and low in feldspar and in ferromagnesian minerals. The influence of parent material is shown in the Alaga soils. These soils formed in sandy materials that have been undergoing weathering for many

thousands of years. Because of the low content of weatherable minerals in the parent material, no clay accumulation is evident in the subsoil. The Cadeville soils are many thousands of years old, but they formed from clayey parent materials. The Alaga and Cadeville soils occur on adjacent landscape and are subjected to approximately the same intensity of each soil-forming factor other than that of parent material. Thus, parent material has been a major factor in difference in the two soils.

The soils in the parish developed mainly from water-deposited materials—marine, coastal, or alluvial sediments. Age of the deposits ranges from Tertiary through Pleistocene to Recent. The older marine and coastal deposits of the Cockfield and Cook Mountain Formations (*3*) and alluvial deposits of the Williana, Bentley, and Montgomery terraces are parent materials for the Alaga, Cadeville, Kirvin, Lucy, Ora, Ruston, and Savannah soils. The texture of the parent material ranges from sand to clay. These deposits occur in the western one-third of the parish.

The deposits of the Prairie and Deweyville Pleistocene terraces (*3*, *8*) are parent material for the Crowley, Frizzell, Guyton, Muskogee, Providence, Waller, and Wrightsville soils. A small part of the Cadeville soils also formed from these deposits. The texture of this parent material ranges from very fine sandy loam to clay.

The Recent deposits of the Arkansas River, before it changed its course about 1,500 years ago (*5*), are parent material of the Gallion, Hebert, Perry, Portland, Rilla, and Sterlington soils. The texture of this parent material ranges from very fine sandy loam to clay.

Recent deposits from present stream systems are the parent material for Alligator, Barclay, Rosebloom, Guyton, Leaf, and Perry soils. The texture of this parent material ranges from very fine sandy loam to clay.

Time

The differences in the length of time that parent materials have been exposed to the active forces of soil formation are commonly reflected in the degree of development of the soil profile.

The soils of Ouachita Parish range from those that are very young and have little profile development to those that are very old and have well-developed profiles. The youngest parent materials in the parish are on the flood plains of the present natural drainageways. The oldest are on the undulating to hilly Coastal Plain uplands that make up the western one-third of the parish. These parent materials are marine sediments that were near shore and were uplifted above sea level several million years ago.

The influence of time on soil formation is well illustrated by comparing the profiles of the Ruston and Rosebloom soils. The Ruston soils developed in the old marine sediments and have been subjected to the factors of soil formation for a long period. In these soils the colloidal clays have moved downward from the A horizon to form a strongly developed B horizon. Some organic matter has accumulated in the A horizon. In contrast, the Rosebloom soils that formed in parent material recently deposited on flood plains along drainageways have not been in place long enough for well-developed horizons to form. They show little or no downward movement of colloidal clays. The only indication of soil development is their gray color. This color indicates that these soils have been in place long enough for wetness and poor aeration to reduce the iron compounds and give them a gray matrix color.

Processes of Soil Formation

The older soils in this parish have distinct horizons, and the young soils have faint horizons. The degree of horizonization, or the formation of horizons, is the result of one or more of the following processes: (1) accumulation of organic matter, (2) leaching of soluble carbonates and bases, (3) reduction, solution, and transfer of iron and manganese, and (4) formation and translocation of silicate clay minerals.

In most soils in this parish, two or more of the processes have influenced the development of horizons. For example, an accumulation of organic matter and the reduction and transfer of iron are reflected in the faint horizons of Barclay, Rosebloom, and Perry soils.

Enough organic matter has accumulated to form an A1 horizon in most of the soils in the parish.

Solution and leaching of carbonates and salts have occurred in all soils in the parish, but the degree of leaching and the extent of influence on horizon development vary. All of the soils on the uplands and terraces have been leached of soluble salts and carbonates and are acid in reaction. Guyton and Rosebloom soils formed in sediments that probably were leached and weathered before they were deposited.

In soils that have an alkaline to calcareous subsoil, such as Gallion, Perry, and Portland soils, the surface layer contains much less calcium carbonate than it once did. Some segregations of calcium carbonate occur at a depth of 20 to 40 inches in the Perry and Portland soils.

Alligator, Leaf, Perry, Rosebloom, and other poorly drained soils in this parish have horizons that developed mainly through reduction, solution, and transfer of iron and manganese, a process called gleization. In these soils, which are alternately wet and moist, the iron compounds are reduced to a soluble form, and gray or blue colors predominate, mainly because of the ferrous iron. If drainage is impeded or the water table is high, anaerobic micro-organisms remove oxygen from the water. The lack of free oxygen results in the reduction of iron and manganese. In places iron and manganese are leached from the soils. In waterlogged soils they rise to the surface and form segregated iron and manganese concretions. Iron and manganese concretions are present in all poorly drained and somewhat poorly drained soils in this parish. Gleyed horizons are present in all the poorly drained soils.

The formation and translocation of silicate clay minerals have contributed to horizon development in all soils of the parish except the youthful soils on flood plains. In this process, clay and iron compounds are removed from the uppermost soil layers. The bleached, light-colored A2 horizon of the Waller and Wrightville soils is an example of an eluviated horizon from which iron compounds and clay have been removed. In many soils in the parish, a B2t horizon has formed through the accumulation of translocated colloidal or sesquioxide clays.

The B2t horizon generally is finer textured than the A1, Ap, and A2 horizons. Rilla silt loam, for example, has an Ap horizon of silt loam, a B2t horizon of silty clay loam, and a C horizon of silt loam. A more obvious evidence of the downward movement of clay is the presence of clay films on the structural surface in the B2t horizon of many soils. Ruston, Rilla, and Guyton soils are good examples of soils that have clay films on the ped surfaces in a well-developed B2t horizon.

Classification of the Soils

Classification consists of an orderly grouping of soils according to a system designed to make it easier to remember soil characteristics and interrelationships. Classification is useful in organizing and applying the results of experience and research. Soils are placed in narrow classes for discussion in detailed soil surveys and for application of knowledge within farms and fields. The many thousands of narrow classes are then grouped into progressively fewer and broader classes in successively higher categories, so that information can be applied to large geographic areas.

Two systems of classifying soils have been used in the United States in recent years. The older system was adopted in 1938 (*2*) and revised later (*7*). The system currently used by the National Cooperative Soil Survey was developed in the early sixties (*6*) and was adopted in 1965 (*10*). It is under continual study.

The current system of classification has six categories. Beginning with the most inclusive, these categories are the order, the suborder, the great group, the subgroup, the family, and the series. The criteria for classification are soil properties that are observable or measurable, but the properties are selected so that soils of similar genesis are grouped together. The placement of some soil series in the current system of classification, particularly in families, may change as more precise information becomes available.

Table 8 shows the classification of each soil series of Ouachita Parish by family, subgroup, and order, according to the current system.

Following are brief descriptions of each of the categories in the current system.

Order.—Ten soil orders are recognized in the current system. They are Entisols, Vertisols, Inceptisols, Aridisols, Mollisols, Spodosols, Alfisols, Ultisols, Oxisols, and Histosols. The properties used to differentiate the soil orders are those that tend to give broad climatic groupings of soils. Two exceptions are Entisols and Histosols, which occur in many different climates.

The four orders to which the soils in Ouachita Parish belong are Alfisols, Entisols, Inceptisols, and Ultisols.

Alfisols have a light-colored surface layer, a clay-enriched B horizon, an accumulation of aluminum and iron, and a base saturation of more than 35 percent.

Entisols are mineral soils that formed either in recent alluvium or in older material consisting of almost pure quartz sand. They have little, if any, horizon development.

Inceptisols are mineral soils that formed in young but not recent material. They lack well-defined horizons. They have a slight accumulation of organic matter in the surface layer and weak, subangular blocky structure in the B2 horizon.

Ultisols are mineral soils that have a horizon of clay accumulation and have base saturation lower than 35 percent.

Suborder.—Each order is divided into suborders, primarily on the basis of soil characteristics that produce

TABLE 8.—*Soil series classified according to the current system of classification*

Series	Family	Subgroup	Order
Alaga	Siliceous, thermic, coated	Typic Quartzipsamments	Entisols.
Alligator	Very fine, montmorillonitic, acid, thermic	Vertic Haplaquepts	Inceptisols.
Barclay	Coarse-silty, mixed, thermic	Aquic Dystrochrepts	Inceptisols.
Cadeville	Fine, mixed, thermic	Albaquic Hapludalfs	Alfisols.
Crowley	Fine, montmorillonitic, thermic	Typic Albaqualfs	Alfisols.
Frizzell	Coarse-silty, siliceous, thermic	Aquic Glossudalfs	Alfisols.
Gallion	Fine-silty, mixed, thermic	Typic Hapludalfs	Alfisols.
Guyton	Fine-silty, mixed, thermic	Typic Glossaqualfs	Alfisols.
Hebert	Fine-silty, mixed, thermic	Aeric Ochraqualfs	Alfisols.
Kirvin	Clayey, mixed, thermic	Typic Hapludults	Ultisols.
Leaf	Clayey, mixed, thermic	Typic Albaquults	Ultisols.
Lucy	Loamy, siliceous, thermic	Arenic Paleudults	Ultisols.
Muskogee	Fine-silty, mixed, thermic	Aquic Paleudalfs	Alfisols.
Ora	Fine-loamy, mixed, thermic	Typic Fragiudults	Ultisols.
Perry	Very fine, montmorillonitic, nonacid, thermic	Vertic Haplaquepts	Inceptisols.
Portland	Very fine, mixed, nonacid, thermic	Vertic Haplaquepts	Inceptisols.
Providence	Fine-silty, mixed, thermic	Typic Fragiudalfs	Alfisols.
Rilla	Fine-silty, mixed, thermic	Typic Hapludalfs	Alfisols.
Rosebloom	Fine-silty, mixed, acid, thermic	Typic Fluvaquents	Entisols.
Ruston	Fine-loamy, siliceous, thermic	Typic Paleudults	Ultisols.
Savannah	Fine-loamy, siliceous, thermic	Typic Fragiudults	Ultisols.
Sterlington	Coarse-silty, mixed, thermic	Typic Hapludalfs	Alfisols.
Waller [1]	Fine-loamy, mixed, thermic	Typic Glossaqualfs	Alfisols.
Wrightsville	Fine, mixed, thermic	Typic Glossaqualfs	Alfisols.

[1] These soils are outside the defined range for the Waller series because they have siliceous rather than mixed mineralogy. They are so similar to Waller soils in morphology, composition, and behavior that a new series is not warranted.

classes having genetic similarity. A suborder has a narrower climatic range than an order. The criteria for suborders reflect either the presence or absence of waterlogging or differences in climate or vegetation.

Great Group.—Each suborder is divided into great groups on the basis of uniformity in the kind and sequence of genetic horizons.

Subgroup.—Each great group is divided into subgroups, one representing the central (typic) segment of the group, and others, called intergrades, made up of soils that have mostly properties of one great group but also one or more properties of another great group.

Family.—Families are established within each subgroup, primarily on the basis of properties important to plant growth. Some of these properties are texture, mineralogy, reaction, soil temperature, permeability, consistence, and thickness of horizons.

Series.—The series has the narrowest range of characteristics of the categories in the classification system. It is defined in the section "How This Survey Was Made."

A detailed description of each soil series in the parish is given in the section "Descriptions of the Soils."

Laboratory Data

The physical and chemical properties from representative soils of seven series are shown in table 9. Samples of Cadeville, Frizzell, Guyton, Hebert, Perry, Rilla, and Ruston soils were analyzed by the Louisiana Agricultural Experiment Station at Louisiana State University. Data obtained by clay mineral analysis are shown in table 10. These estimates were made by A. G. Caldwell, professor of agronomy, Louisiana State University. Detailed descriptions of all the soils analyzed are given in the section "Descriptions of the Soils."

Methods of Sampling and Analysis

Samples were taken from pits at carefully selected locations. The samples were air dried, rolled, crushed, and passed through a 2-millimeter, square-holed sieve. The results reported in table 9 are on an oven dry basis. For methods used, see Soil Survey Investigations Report No. 1 (*11*).

The Louisiana Agricultural Experiment Station determined particle size by using a modification of the Bouyucos hydrometer procedure. Water content at 15-atmosphere tension was determined on sieved samples by using pressure membrane apparatus. An atmosphere is about 1 bar of tension. Bulk density measurements were made on saran-coated clods in an air dry state. Extractable bases were determined on original ammonium acetate extracts with a Beckman DU flame spectrophotometer. Extractable acidity was determined by the triethanolamine method, using a barium chloride solution. The cation exchange capacity was determined by direct distillation of absorbed ammonia. Organic carbon was determined by a modification of the Walkley-Black wet combustion method. Nitrogen was determined by the Kjeldahl method. The pH measurements were made by a glass electrode, using a soil-water ratio of 1:1 and in a 0.01 molar $CaCl_2$ solution using a soil-solution ratio of 1:2. Available phosphorus was determined by the Bray strong acid method.

Interpretation of Soil Characterization Data [8]

The soils analyzed are acid or mostly acid. The surface horizons range from slightly acid in Rilla silt loam to very strongly acid in the Guyton silt loam. The subsoils of the Guyton silt loam and the Cadeville fine sandy loam are extremely acid, whereas the C horizon of Perry clay is mildly alkaline. The remaining soils show moderate differences in reaction at different depths. As might be expected in such acid soils, the content of extractable calcium is very low. All the soils need liming for good growth of most agronomic crops.

The extractable magnesium content of Ruston fine sandy loam is very low. It is low in the surface layers of Frizzell silt loam and Guyton silt loam. For these soils addition of magnesium, preferably in the form dolomitic limestone, probably is needed for agronomic crops. Moderate amounts of magnesium are in the surface layers of Hebert silt loam and Rilla silt loam. Large amounts of magnesium are throughout Perry clay and in the lower horizons of Cadeville fine sandy loam, Frizzell silt loam, Guyton silt loam, Hebert silt loam, and Rilla silt loam. The subsoil of Cadeville fine sandy loam and Frizzell silt loam has a low calcium to magnesium ratio. This condition is often associated with poor physical characteristics, as in a fragipan, for example.

Perry clay is high in extractable potassium. All other soils are low to very low in potassium. All except Perry clay can be expected to respond to potassium fertilizer.

Large amounts of extractable sodium normally are related to undesirable soil structure. Relatively large amounts of sodium are present at a depth of 30 inches in Perry clay, 56 inches in Frizzell silt loam, and 24 inches in Guyton silt loam. The high sodium content of these layers possibly restricts movement of water through these profiles.

The amount of phosphorus removed by the strongly acid Bray extractant was very small to extremely small in the surface layers of all soils except Perry clay. The larger amounts of phosphorus extracted from the lower horizons of Perry clay, Hebert silt loam, and Rilla silt loam probably indicate less intense weathering of these horizons. In some places these lower horizons can provide considerable amounts of phosphorus to crops that have deeply penetrating roots. The lower horizons of the other soils provide little expectation for phosphorus uptake.

Percent base saturation is moderate in Hebert silt loam and Rilla silt loam and qualifies them for the order Alfisols. Although base saturation of the upper horizons of Cadeville fine sandy loam, Frizzell silt loam, and Guyton silt loam is fairly low, it increases sufficiently in the lower horizons to qualify them as Alfisols. The base saturation of the lower horizons of the Ruston fine sandy loam somewhat exceeds the 35 percent saturation criterion for the order of Ultisols.

Hebert silt loam, Rilla silt loam, and similar soils that are medium textured or moderately fine textured throughout their profile have excellent water-holding characteristics. Based on the bulk densities and the moisture held, 9 inches of water can be held available for plants in the upper 36 inches of soil by Hebert silt loam and

[8] By A. G. CALDWELL, professor of agronomy, Louisiana State University.

TABLE 9.—*Physical and*

[Analyzed by Soils Laboratory of the Louisiana Agricultural

Soil and sample number	Horizon	Depth from surface	Particle-size distribution			Water content 15-atm.	Bulk density (air dry clods)
			Sand (2–0.05 mm.)	Silt (0.05–0.002 mm.)	Clay (less than 0.002 mm.)		
		In.	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Gm./cc.*
Cadeville fine sandy loam (S67La–37–1)	A1	0–1	61	33	6	5.4	
	A2	1–7	59	32	9	3.6	1.58
	B1t	7–12	20	40	40	14.5	
	B2t	12–23	9	36	55	20.6	1.89
	B31t	23–34	9	39	51	20.3	1.88
	B32	34–46	10	39	51	20.3	1.84
	C1	46–54	11	40	49	21.0	1.84
	C2	54–64	16	41	43	17.6	1.86
	C3	64–78	9	44	47	19.1	1.89
Frizzell silt loam (S65La–37–22)	A1	0–2	33	56	11	5.2	
	B&A21	2–9	36	49	15	5.2	1.50
	B&A21	9–22	34	50	16	6.7	1.57
	B&A22	22–35	34	50	16	7.2	1.58
	B21t	35–43	27	50	23	9.9	1.63
	B22t	43–56	20	45	35	14.2	1.65
	B3t	56–75	40	42	18	7.7	1.69
Guyton silt loam (S65La–37–24)	A1	0–2	24	62	14	5.7	
	A21	2–6	26	64	10	3.4	1.51
	A22	6–19	23	65	12	4.3	1.64
	Bt&A2	19–24	21	50	20	8.5	1.71
	B2t	24–35	21	52	27	11.8	1.74
	B31t	35–47	22	54	24	11.0	1.69
	B32	47–68	23	53	24	10.2	1.81
Hebert silt loam (S64La–37–9)	Ap	0–7	36	53	11	3.9	1.55
	A2	7–10	35	52	13	4.1	1.63
	B1t	10–14	26	46	28	10.9	1.76
	B21t	14–24	25	47	28	11.0	1.80
	B22t	24–30	36	41	23	8.8	1.75
	B23t	30–37	21	49	30	10.9	1.79
	B3	37–50	45	37	18	6.8	1.70
	C	50–72	22	58	20	8.1	1.70
Perry clay (S65La–37–21)	A11	0–2	4	26	70	29.7	
	A12	2–8	0	19	81	27.2	
	B21g	8–14	0	17	83	28.0	
	B22g	14–20	1	16	83	22.9	
	B23g	20–30	1	17	82	28.3	
	11C1	30–35	0	18	82	27.7	
	11C2	35–52	1	13	86	27.6	
	111Cg	52–58	2	9	89	30.6	
Rilla silt loam (S64La–37–10)	Ap	0–5	31	58	11	4.6	1.50
	A2	5–8	25	59	16	4.9	1.74
	B21t	8–11	16	59	25	9.8	1.74
	B21t	11–14	15	54	31	12.4	1.75
	B22t	14–21	17	54	29	11.4	1.74
	B31t	21–35	22	53	25	10.2	1.73
	B32	35–49	41	41	18	6.9	1.69
	C1	49–63	26	55	19	8.2	1.73
	C2	63–69	44	40	16	6.7	1.72
Ruston fine sandy loam (S67La–37–2)	A1	0–1	76	20	4	4.8	
	A21	1–6	75	20	5	2.2	
	A22	6–14	67	23	10	2.7	1.69
	B&A	14–19	57	24	19	6.3	1.70
	B21t	19–26	49	24	27	9.7	1.70
	B22t	26–42	64	10	17	6.4	1.73
	A'2	42–53	73	13	14	4.7	1.68
	B'2t	53–63	72	10	18	6.5	1.70
	B'2t	63–73	75	8	17	5.9	1.64
	A'2	73–81	78	9	13	4.8	1.64
	B'2t	81–90	69	11	20	7.4	1.71

[1] Trace.

chemical test data

Experiment Station. Dashes indicate analyses not made]

Extractable bases				Extractable acidity	Cation exchange capacity (NH_4OAc)	Organic carbon	Nitrogen	Reaction		Available phosphorus
Ca	Mg	Na	K					Soil-water ratio of 1:1	Soil-solution ratio of 1:2 (0.01 molar $CaCl_2$ solution)	
Meq./100 gm.	*Meq./100 gm.*	*Meq./100 gm.*	*Meq./100 gm.*	*Meq./100 gm.*	*Meq./100 gm.*	*Pct.*	*Pct.*	*pH*	*pH*	*p.p.m.*
2.0	0.9	0.1	0.2	5.1	6.4	1.34	0.079	5.2	4.7	6
1.1	0.8	0.1	0.1	3.8	4.8	0.34	0.034	5.0	4.4	2
1.9	3.8	0.2	0.4	15.9	19.8	0.36	0.048	4.4	3.8	1
2.0	7.1	0.4	0.6	21.7	29.1	0.24	0.043	4.2	3.5	1
2.3	8.6	0.6	0.6	19.6	29.2	0.13	0.036	4.0	3.5	1
2.8	10.2	0.7	0.6	15.9	28.1	0.18	0.032	4.0	3.6	1
3.9	11.9	1.0	0.7	11.5	26.8	0.11	0.031	4.1	3.8	12
4.2	11.2	1.1	0.6	8.6	24.4	0.09	0.029	4.2	4.0	32
5.8	14.0	1.4	0.8	7.0	27.2	0.11	0.030	4.4	4.3	62
2.0	0.8	0.1	0.1	6.0	7.2	1.43	0.816	5.1	4.6	8
0.6	0.8	0.1	0.1	6.5	6.4	0.41	0.035	4.6	4.1	2
0.4	0.8	0.2	0.1	8.5	8.3	0.26	0.026	4.7	4.0	[1]
0.4	0.9	0.3	0.1	8.8	9.0	0.26	0.025	4.8	3.9	[1]
0.6	1.5	0.7	0.1	10.8	11.8	0.17	0.027	4.6	4.0	[1]
1.5	3.1	1.3	0.1	13.4	17.7	0.20	0.028	4.6	3.9	[1]
1.7	2.5	1.4	0.1	5.0	9.5	0.18	0.017	4.4	4.0	[1]
0.8	0.6	0.2	0.1	7.7	7.7	2.15	0.104	4.7	4.1	12
0.8	0.4	0.1	0.1	4.0	4.3	0.69	0.037	4.7	4.2	4
0.8	0.3	0.1	0.1	5.0	5.2	0.28	0.022	4.7	4.0	3
0.6	0.7	0.4	0.1	9.8	10.2	0.22	0.023	4.6	3.8	2
1.5	1.8	1.0	0.1	12.2	14.4	0.22	0.024	4.4	3.7	2
2.3	2.5	1.7	0.1	9.3	15.0	0.19	0.024	4.2	3.7	2
2.6	2.9	2.0	0.1	6.2	12.8	0.22	0.024	4.3	3.9	2
3.2	1.0	0.1	0.1	2.4	5.9	0.46	0.045	5.8	5.6	16
2.6	1.3	0.2	0.1	2.7	5.9	0.35	0.029	5.6	5.1	14
3.3	3.9	0.4	0.2	10.8	16.6	0.42	0.035	4.6	4.0	30
3.5	4.9	0.5	0.2	8.6	16.0	0.26	0.027	4.6	4.0	33
3.5	5.1	0.6	0.2	5.6	13.5	0.24	0.022	4.9	4.3	30
4.8	7.1	0.6	0.3	4.0	15.8	0.24	0.022	5.1	4.7	12
4.0	4.4	0.4	0.2	2.3	10.8	0.17	0.019	5.5	5.2	56
5.6	5.1	0.3	0.2	2.2	13.6	0.17	0.020	5.9	5.5	108
16.7	11.5	0.5	1.4	20.5	53.1	6.46	0.447	4.8	4.6	159
14.1	12.3	0.6	1.1	16.6	44.8	1.72	0.166	4.7	4.5	67
14.9	15.1	1.2	0.9	15.4	47.1	1.20	0.119	4.8	4.6	48
15.8	15.5	1.7	0.8	12.7	46.1	0.97	0.097	5.4	5.2	44
17.3	17.7	2.9	0.8	9.7	44.9	0.71	0.082	6.1	5.9	41
15.7	20.7	4.3	0.8	5.4	46.0	0.60	0.064	6.8	6.9	68
25.1	22.2	5.6	0.8	2.6	45.0	0.46	0.061	7.4	7.5	118
31.9	24.0	6.2	1.0	3.8	48.1	0.44	0.058	7.8	7.4	126
3.0	1.5	0.1	0.2	2.3	6.9	1.26	0.092	6.1	5.9	18
2.8	1.5	0.2	0.1	2.7	7.1	0.32	0.033	5.5	4.9	20
3.8	2.8	0.4	0.2	8.4	13.6	0.29	0.035	4.6	4.1	33
4.2	4.0	0.6	0.3	10.2	17.2	0.25	0.034	4.8	4.2	53
4.0	3.9	0.8	0.3	9.5	16.2	0.22	0.031	4.7	4.2	62
3.5	3.7	1.1	0.2	8.4	14.8	0.24	0.027	4.9	4.2	94
2.5	2.9	1.2	0.2	4.9	10.5	0.21	0.020	4.9	4.4	128
3.9	4.2	1.8	0.2	3.9	12.4	0.17	0.021	5.2	4.6	121
4.1	4.1	1.6	0.2	2.5	11.3	0.24	0.018	6.3	5.9	136
1.8	0.5	0.1	0.1	7.0	6.6	1.61	0.067	5.2	4.9	3
0.8	0.3	0.1	0.1	2.5	2.7	0.42	0.036	5.1	4.8	4
0.4	0.2	0.1	0.1	2.7	2.6	0.25	0.024	4.9	4.4	2
1.2	0.6	0.1	0.2	4.6	6.0	0.18	0.029	4.7	4.4	2
2.4	1.5	0.1	0.5	5.7	9.2	0.14	0.034	4.9	4.4	1
1.2	1.1	0.1	0.2	3.8	5.6	0.07	0.023	4.9	4.4	1
0.9	0.8	0.1	0.1	2.7	3.9	0.03	0.017	4.8	4.4	2
1.2	1.1	0.1	0.2	3.4	6.1	0.03	0.020	5.0	4.4	2
1.2	1.1	0.1	0.1	2.9	5.5	0.02	0.018	4.9	4.5	2
0.8	0.8	0.1	0.1	2.3	3.8	0.02	0.015	4.9	4.4	2
0.8	1.4	0.1	0.2	4.1	6.0	0.02	0.016	4.7	4.2	2

TABLE 10.—*Mineralogical data* [1]

Soil and sample number	Horizon	Depth from surface	Fine clay (less than 0.2μ)	Coarse clay (0.2–2.0μ)	Silt (0.002–0.05 mm.)
		In.			
Frizzell silt loam (S65La–37–22)	A1	0–2	M_1	$V_2K_2I_3$	Q_1F_2
	B&A21	2–22	M_1	$V_2K_2I_3Q_3$	Q_1F_2
	B22t	43–56	M_1	$V_2K_2I_3$	Q_1F_2
Guyton silt loam (S65La–37–24)	A1	0–2	M_1	$K_2I_3B_3M_3$	Q_1F_3
	A22	6–19	M_1	$K_2I_3V_3M_3$	Q_1F_3
	B2t	24–35	M_1	$K_2Q_3M_3$	Q_1
	B32	47–63	M_1	$K_2I_3M_3$	Q_1
Hebert silt loam (S64La–37–9)	Ap	0–7	M_1K_3	$K_2I_2V_3$	$Q_2F_2K_3I_3V_3$
	B21t	14–24	M_1	$K_2I_2V_3$	$Q_2F_2K_3I_3V_3$
	C	50–70	M_1K_3	$K_2I_2V_3$	$Q_2F_2K_3I_3V_2$
Perry clay (S65La–37–21)	A11	0–2	$M_1I_3K_3$	$I_2K_2V_3M_3$	$Q_2F_3I_3K_3$
	B22g	14–20	$M_1I_3K_3$	$I_2K_2M_2$	$Q_2F_3I_3K_3$
	IIC2	35–52	$M_1I_3K_3$	$K_2I_2M_2V_3$	$Q_2F_2I_2V_2F_3$
Rilla silt loam (S64La–37–10)	Ap	0–5	M_1K_3	$V_3I_2K_2$	$Q_2F_2I_3K_3$
	B21t	8–14	$M_1I_3K_3$	$I_2K_2V_3M_3$	$Q_2F_2I_3K_3V_3$
	C1	49–63	$M_1I_3K_3$	$V_2K_2I_2$	$Q_2F_2I_3K_3V_3$

[1] Code for mineralogical data:
A. Abbreviation of mineral names:
F–feldspars M–montmorillonite
I–illite (mica) V–vermiculite
K–kaolinite Q–quartz
B. Indication of quantity:
1.–Abundant component–more than 40 percent
2.–Less abundant component–10 to 40 percent
3.–Minor component–less than 10 percent
C. Minerals are listed in decreasing percentages as to their presence in sample from left to right.

10 inches by Rilla silt loam. These values are somewhat exaggerated because air-dry bulk density was used in the calculations instead of moist dry density and sieved samples were used instead of undisturbed samples. Sieved samples have been shown to hold more moisture than undisturbed soil.

Substantial amounts of water available to plants can be stored in the upper 36 inches of Cadeville fine sandy loam, Frizzell silt loam, and Guyton silt loam, but much of the rainfall runs off Cadeville fine sandy loam and does not refill the soil reservoir. Recharging is also a problem with the Frizzell silt loam and Guyton silt loam. Perry clay has a large capacity to hold water, but it is fine textured and seals when wet; water infiltrates very slowly.

The coefficient of linear extensibility (COLE), a measure of volume change as soils are wet and dry, was determined on samples of Cadeville fine sandy loam and Ruston fine sandy loam. COLE values for Ruston fine sandy loam ranged from a high of 0.015 in the 19- to 26-inch horizon (B21t) to a low of 0.002 in the 26- to 53-inch horizon (B22t and A'2). These values indicate low volume change on wetting and drying. COLE values for Cadeville fine sandy loam ranged from a high of 0.097 in the 12- to 23-inch horizon (B2t) to a low of 0.079 in the 23- to 46-inch horizons (B31t and B32). These values indicate high volume changes on wetting and drying.

Montmorillonite is the most abundant clay mineral in the 0.2 micron clay of Frizzell silt loam, Guyton silt loam, Hebert silt loam, Rilla silt loam, and Perry clay. It is the only kind found in any amount in the fine clay of Frizzell silt loam and Guyton silt loam. Small amounts of kaolinite and mica-illite are in the fine clay fractions of Hebert silt loam, Rilla silt loam, and Perry clay. The coarse clay fraction of Perry clay and Frizzell silt loam, Guyton silt loam, and Rilla and Hebert silt loams contains moderate amounts of kaolinite, mica-illite, and vermiculite. Kaolinite is most abundant in Guyton silt loam and Hebert silt loam; vermiculite is most abundant in Frizzell silt loam and Rilla silt loam; and mica-illite is most abundant in Perry clay. In most horizons tested, there generally was less coarse clay than fine clay.

Quartz is by far the most abundant mineral in the silt fraction. Feldspars are in small amounts in Guyton silt loam and in moderate amounts in Frizzell silt loam. Hebert silt loam, Rilla silt loam, and Perry clay contain appreciable amounts of mica-illite, kaolinite, and vermiculite, large amounts of quartz, and moderate amounts of feldspars. These findings seem to support the chemical data because these latter three soils have a better supply of extractable potassium. The mica-illite should be expected to resupply them with potassium on a continuing basis. The small amount of mica-illite in Frizzell silt loam and Guyton silt loam indicates poor possibilities for potassium resupply from this source.

The B2 horizon of Frizzell silt loam and of Guyton silt loam has a high content of fine clay, which dominantly is montmorillonite. Percentage is 17.6 for Frizzell loam and 15.7 for Guyton silt loam. This high clay content, along with substantial amounts of extractable sodium, suggests very slow movement of soil, air, and water and could contribute to their relatively poor drainage.

General Nature of the Parish

The known history of the parish dates back to 1542, when De Soto stopped at a large Indian village near the present site of Monroe. Ouachita Parish was first established in 1807 as one of the original 12 large parishes in the State. It was later subdivided into several parishes. The present boundaries were established in 1869. The productive soils on the river bottom lands make the parish important for farming. The parish also is important for producing timber because it has a large acreage of fast-growing pines and of mixed hardwoods. The oilfields and gasfields in the parish and surrounding parishes add greatly to the economy of the area.

The population of the parish is mostly in cities, towns, and nearby communities. Monroe, the parish seat and largest city, had a population of 52,219 in 1960, according to the U.S. Census. Monroe was first settled in 1780. The population of the parish was 101,663 in 1960. Northeast Louisiana State College is located in Monroe, and the North Louisiana Agricultural Experiment Station is at Calhoun.

Physiography

Ouachita Parish has three major physiographic areas—the undulating to hilly Coastal Plain uplands of Cockfield and Cook Mountain Formations; the nearly level to gently sloping terraces of the Deweyville, Prairie, Montgomery, and Bentley Formations; and the level and nearly level recent flood plains (*5*).

The undulating to hilly soils on the Coastal Plain uplands of the Cockfield and Cook Mountain Formations are dominant in the western one-third of the parish. This area is dissected by many natural drainageways. Elevations range from about 200 feet in the eastern part of the area to 320 feet in the western part. Relief is 75 to 100 feet in a 1- to 5-square mile area.

The nearly level to gently sloping soils on Pleistocene (*4*) terraces make up about one-third of the parish. The Prairie and Deweyville (*5*) Formations are dominant. These terraces are mostly in a strip about 4 miles wide along the western side of the Ouachita River and in the northeastern part of the parish. Elevations range from 80 to 160 feet and are mostly about 95 feet. Relief is less than 5 feet locally. Another important terrace area is in the southeastern part of the parish. It begins near Pine Grove and extends southward for about 8 miles. This is also of Pleistocene age. It has elevations of 60 to 80 feet.

The level and nearly level flood plains make up one-third of the parish. These loamy and clayey sediments were deposited primarily by the Arkansas River before it shifted to its present location about 1,500 years ago (*5*).

The Ouachita River, Bayou Bartholomew, Bayon De Siard, and Youngs Bayou occupy former channels of the Arkansas River.

Many oxbow lakes, such as Horseshoe Lake and Wall Lake, were created when the Arkansas River shifted its course because the Ouachita River was overloaded with sediment.

Natural levees are important landscape features adjacent to streams. These levees are low ridges flanking both sides of streams that periodically overflow. Since the coarsest and greatest quantities of sediments are deposited closest to stream channels, the natural levees are highest and thickest in these areas and gradually become thinner as distance from the channels increases. In general, the greater the distance from the stream, the greater the percentage of the finer grained sediments. Gallion, Hebert, Rilla, and Sterlington soils are on natural levees and are choice soils for farming.

The natural levees of the larger streams sealed off drainage from the terraces, and rim swamps were formed. Black Bayou drainageway is an example of both a rim swamp and a back swamp. Elevations of the flood plains range from 45 to 90 feet. Levees have been constructed on the eastern side of the Ouachita River for protection from flooding. Large areas along the western side of the Ouachita River and along Bayou LaFourche are subject to flooding.

The Ouachita River drains all of Ouachita Parish. The western half of the parish drains generally east to the Ouachita River, then south. Most of the drainage in the eastern half of the parish is away from the Ouachita River toward the east and is collected in Bayou LaFourche. Bayou LaFourche, in turn, drains south into the Boeuf River, then into the Ouachita River.

Farming

The total number of farms in the parish decreased from 2,666 in 1920 to 785 in 1964, according to the U.S. Census of Agriculture. The average-sized farm in the parish in 1964 was 163 acres.

Historically, the agriculture in Ouachita Parish has been varied due to the strong contrast in soils, and many different crops have been grown. Between 1865 and 1940, cotton was the major crop and was grown extensively both in the upland section of the parish and on the natural levees in the river bottom lands; 31,227 acres were grown in 1919. The acreage decreased to 15,281 in 1944 and has continued at this level through 1964. The acreage in cotton has shifted entirely from the uplands to the river bottom lands because of lower production cost. The soils of the river bottom lands are better adapted to multirow equipment and production per acre is higher than for the upland soils.

In 1958, Ouachita Parish had 57,800 acres of cropland, 13,293 acres of pasture, and 263,000 acres of woodland. In 1964, Ouachita had 17,900 pecan trees (fig. 11), 10,448 peach trees, and 18,433 cattle.

The total woodland acreage changed little until the 1960's. As upland areas returned from cotton to pine woodland, new areas were cleared in the river bottom lands. At present, the total woodland acreage is steadily decreasing as a result of extensive land clearing for rice and soybean production in the bottom land area and for use as pasture in the uplands. Residential development is also replacing some woodland areas.

Climate [9]

Ouachita Parish has a mild, humid subtropical climate that is characterized by relatively high rainfall in winter and spring and drier weather in summer and autumn.

[9] By GEORGE W. CRY, climatologist for Louisiana, National Weather Service, U. S. Department of Commerce.

Figure 11.—**A pecan orchard on Hebert complex.**

Table 11 lists data on temperature and precipitation recorded at Calhoun.

During much of the year, temperatures and temperature changes are moderated by the prevalent winds from the Gulf of Mexico. Because the high moisture content of this air is favorable for the development of convective thundershower activity, maximum summer temperatures are fairly uniform; they are 90° F. or higher on about 80 percent of the days in June, July, and August, but they rarely exceed 100° F. The highest temperatures occur with westerly or northerly dry winds.

Winters are usually mild; an average of 44 days a year have temperatures of 32° or lower. The weather in winter varies because winds alternately bring warm, moist tropical air from the south and cold, dry polar air from the north. The cold air seldom lasts for more than a week. Precipitation during the cooler season results mainly from activity along fronts, which are boundaries between warm and cold air, or it results from the convergence of air in cyclonic storms that develop over the Gulf of Mexico or the Southern States.

The average date of the first 32° or lower temperature in fall is November 6, and the average date of the last 32° or lower temperature in spring is March 20. The growing season, or the number of days between those dates, is 231.

Mean annual rainfall is 50.5 inches; monthly averages range from about 5.5 inches in December and January to less than 3 inches in August, September, and October. The average rainfall during the active growing season is usually sufficient for many kinds of crops, but it may be deficient or excessive in some years. Prolonged periods of continuous rainfall are infrequent and occur only during the cooler months. Most rain is in the form of showers, particularly in summer. On rare occasions heavy rain accompanies the remnants of tropical cyclones in summer or fall. The most rainfall in 1 day at Calhoun was 9.63 inches on December 13, 1931.

Table 12 shows probabilities of the last low temperatures of 32°, 36°, and 40° in spring and the first in fall. The temperatures were recorded in a standard Weather Bureau instrument shelter in which the thermometer was 4½ feet above the ground. On clear, calm nights, the temperature at shelter level usually will be several degrees warmer than the air near the ground. Under these conditions, frost could form on vegetation even though temperature in the shelter is above 32°. For this reason, and because temperature above freezing can adversely affect vegetation or seeds in beds, probabilities for 36° and 40° temperatures are included. These data have been adjusted, where necessary, for years not having temperature at the indicated threshold. The data are applicable to most of the parish.

Snowfall is of minor importance in Ouachita Parish and rarely accumulates in measurable quantities, though 1 to 4 inches of snow occurs infrequently, usually in December, January, or February. One of the heaviest snowfalls occurred on January 30, 1949, when 11 inches fell at Calhoun and 9 inches at Monroe. Hail is also infrequent at any particular place, though at times it covers small local areas in spring and autumn.

TABLE 11.—*Temperature and precipitation data*

[Data from Calhoun experiment station for the period 1931 through 1966]

Month	Temperature				Precipitation				
	Mean daily maximum	Mean daily minimum	Two years in 10 will have at least 4 days with—		Mean total	One year in 10 will have—		Days with snow cover of 1 inch or more	Depth of snow on days with snow cover
			Maximum temperature equal to or higher than—	Minimum temperature equal to or lower than—		Less than—	More than—		
	°F.	°F.	°F.	°F.	In.	In.	In.	No.	In.
January	58	37	76	19	5.4	1.8	10.7	1	3
February	62	40	78	25	4.8	1.7	8.1	(1)	1
March	69	45	83	30	4.7	2.5	7.0	(1)	1
April	77	54	87	39	4.9	2.0	8.4	0	0
May	84	62	91	51	4.8	1.8	9.3	0	0
June	91	69	98	60	3.6	.6	7.7	0	0
July	94	72	100	66	4.1	1.3	7.6	0	0
August	94	71	102	60	2.8	.5	5.5	0	0
September	89	64	99	51	2.9	.5	7.3	0	0
October	81	53	92	38	2.6	.2	7.6	0	0
November	68	44	82	28	4.3	1.4	8.6	0	0
December	60	39	[2] 75	[3] 23	5.6	2.3	10.3	(1)	2
Year	77	54	102	14	50.5	33.6	67.7	(1)	2

[1] Less than 0.5 day. [2] Mean annual highest temperature. [3] Mean annual lowest temperature.

TABLE 12.—*Probabilities of last low temperatures in spring and first in fall*

[All data from Calhoun experiment station for the period 1931 through 1966]

Probability	Dates for given probability at temperature of—				
	24° F. or lower	28° F. or lower	32° F. or lower	36° F. or lower	40° F. or lower
Spring:					
1 year in 10 later than	March 10	March 20	April 7	April 19	April 25
2 years in 10 later than	March 1	March 13	April 1	April 13	April 21
5 years in 10 later than	February 11	February 28	March 20	April 2	April 13
Fall:					
1 year in 10 earlier than	November 13	November 3	October 22	October 14	October 3
2 years in 10 earlier than	November 20	November 9	October 27	October 19	October 8
5 years in 19 earlier than	December 4	November 21	November 6	October 28	October 17

Relative humidity in this area is fairly high. Normally it is highest at night and lowest in the afternoon. It is consistently highest in summer and lowest following a strong invasion of cold, dry polar air in winter.

During the year, about 25 percent of the days are cloudy, about 30 percent are clear, and the rest are partly cloudy.

Water Supply [10]

In Ouachita Parish large industrial supplies of ground water are obtained chiefly from water-bearing sand strata in the Sparta Formation of Eocene age. Small domestic supplies are obtained from wells in discontinuous sand strata in the Cockfield Formation of Eocene age and also in sand and gravel of Pleistocene and Recent age.

The Sparta Formation is the oldest geological unit penetrated by water wells in the parish. No sand strata bearing fresh water have been found below this formation. The Sparta Formation is dominantly sandy. Massive beds of sand 100 feet or more thick occur in the middle of the formation. The water is generally excellent for most purposes. Industrial wells yield as much as 1,500 gallons per minute, but yield varies according to permeability, thickness, and lateral extent of the sands.

In many places, the Pleistocene sand and gravel beds are thin and cannot supply large quantities of water to wells. In other places where the sands are thicker, large capacity wells are possible. Although most of the Tertiary deposits contain impotable water in the northeastern and southeastern parts of the parish, a recent investigation indicates that nearly all areas of the parish have at least one Tertiary sand deposit that contains soft, potable water.

Because of heavy withdrawals, there has been a water-level decline in the Sparta Formation. In the last 25 years, the levels have declined about 50 feet in some areas and as much as 120 feet in others.

Ouachita Parish has an abundant supply of surface water. The city of Monroe uses Bayou De Siard as a source of water. Water is pumped into Lake Bartholomew from Bayou Bartholomew and flows by gravity through Bayou De Siard to the city. Efforts have been made to maintain a flow of high-quality water in the Ouachita River. Other surface water reserves include Cheniere Brake, Black Bayou Lake, and several hundred private ponds that are used for recreation and to supply water for domestic purposes.

Industries

Ouachita Parish has more than 100 manufacturing plants. The discovery of natural gas in the parish in 1915 and 1916 contributed greatly to the economy of the area. It helped establish Monroe as the distribution center for the northeastern part of Louisiana and the southeastern part of Arkansas. Many of the industries of the parish are related to oil and gas production. A large pulp and paper mill is located in West Monroe.

[10] The information on ground water in this section was furnished by JAMES E. ROGERS, hydrologist, U. S. Department of Interior, Water Resources Division of the Geological Survey.

Literature Cited

(1) AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS.
1961. STANDARD SPECIFICATIONS FOR HIGHWAY MATERIALS AND METHODS OF SAMPLING AND TESTING. Ed. 8, 2 v., illus.

(2) BALDWIN, MARK, KELLOGG, CHARLES E., and THORP, JAMES.
1938. SOIL CLASSIFICATION. U.S. Dept. Agr. Ybk., pp. 970–1001, illus.

(3) FERGUS, PRESTON.
1935. MONROE GAS FIELD, LOUISIANA IN GEOLOGY OF NATURAL GAS. Am. Asso., Petrol. Geol., pp. 741–72.

(4) FISK, HAROLD N.
1944. GEOLOGY INVESTIGATIONS OF ALLUVIAL VALLEY OF THE LOWER MISSISSIPPI RIVER. U.S. Army Corps of Engin., 78 pp., illus.

(5) FLEETWOOD, A. R.
1969. GEOLOGICAL INVESTIGATIONS OF THE OUACHITA RIVER AREA, LOWER MISSISSIPPI VALLEY. Tech. Rept. No. S–69–2, U.S. Army Corps of Engin., Waterways Expt. Sta., 24 pp., illus.

(6) SIMONSON, ROY W.
1962. SOIL CLASSIFICATION IN THE UNITED STATES. Sci. 137: 1027–1034, illus.

(7) THORP, JAMES, and SMITH, GUY D.
1949. HIGHER CATEGORIES OF SOIL CLASSIFICATION: ORDER, SUBORDER, AND GREAT SOIL GROUPS. Soil Sci. 67: 117–126.

(8) WANG, KIA KANG.
1952. GEOLOGY OF OUACHITA PARISH. Dept. of Consv., La. Geol. Survey Geol. Bul. No. 28, 126 pp., illus.

(9) UNITED STATES DEPARTMENT OF AGRICULTURE.
1951. SOIL SURVEY MANUAL. U.S. Dept. Agr. Handbook No. 18, 503 pp., illus.

(10) ———
1960. SOIL CLASSIFICATION, A COMPREHENSIVE SYSTEM, 7TH APPROXIMATION. 265 pp., illus. [Supplements issued in March 1967 and September 1968]

(11) ———
1967. SOIL SURVEY INVESTIGATIONS REPORT NO. 1: SOIL SURVEY LABORATORY METHODS AND PROCEDURES FOR COLLECTING SOIL SAMPLES. 50 pp.

(12) UNITED STATES DEPARTMENT OF DEFENSE.
1968. UNIFIED SOIL CLASSIFICATION SYSTEM FOR ROADS, AIRFIELDS, EMBANKMENTS AND FOUNDATIONS. MIL–STD–619B, 30 pp., illus.

Glossary

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Available water capacity (also termed 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 capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil.

Base saturation. The degree to which material that has base-exchange properties is saturated with exchangeable cations other than hydrogen, expressed as a percentage of the cation-exchange capacity.

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 clay on the surface of a soil aggregate. Synonyms: Clay coat, clay skin.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrations of compounds, or of soil grains cemented together. The composition of some concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are examples of material commonly found 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 and brittle; little affected by moistening.

Drainage class (natural). Refers to the conditions of frequency and duration of periods of saturation or partial saturation that existed during the development of the soil, 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 different classes of natural soil drainage are recognized.

Excessively drained soils are commonly very porous and rapidly permeable and have a low water-holding capacity.

Somewhat excessively drained soils are also very permeable and are free from mottling throughout their profile.

Well-drained soils are nearly free from mottling and are commonly of intermediate texture.

Moderately well drained soils commonly have a slowly permeable layer in or immediately beneath the solum. They have uniform color in the A and upper B horizons and have mottling in the lower B and the C horizons.

Somewhat poorly drained soils are wet for significant periods but not all the time, and in Podzolic soils commonly have mottlings below 6 to 16 inches, in the lower A horizon and in the B and C horizons.

Poorly drained soils are wet for long periods and are light gray and generally mottled from the surface downward, although mottling may be absent or nearly so in some soils.

Very poorly drained soils are wet nearly all the time. They have a dark-gray or black surface layer and are gray or light gray, with or without mottling, in the deeper parts of the profile.

Flood plain. Nearly level land, consisting of stream sediments, that borders a stream and is subject to flooding unless protected artificially.

Fragipan. A loamy, brittle, subsurface horizon that is very low in organic matter and clay but is rich in silt or very fine sand. The layer is seemingly cemented. When dry, it is hard or very hard and has a high bulk density in comparison with the horizon or horizons above it. When moist, the fragipan tends to rupture suddenly if pressure is applied, rather than to deform slowly. The layer is generally mottled, is slowly or very slowly permeable to water, and has few or many bleached fracture planes that form polygons. Fragipans are a few inches to several feet thick; they generally occur below the B horizon, 15 to 40 inches below the surface.

Gleyed soil. A soil in which waterlogging and lack of oxygen have caused the material in one or more horizons to be neutral gray in color. The term "gleyed" is applied to soil horizons with yellow and gray mottling caused by intermittent waterlogging.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. These are the major horizons:

O horizon.—The layer of organic matter on the surface of a mineral soil. This layer consists of decaying plant residues.

A horizon.—The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living organisms are most active and therefore is marked by the accumulation of humus. The horizon may have lost one or more of soluble salts, clay, and sesquioxides (iron and aluminum oxides).

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 some combination of these; (2) by prismatic or blocky structure; (3) by redder or stronger colors than the A horizon; or (4) by some combination of these. Combined A and B horizons are usually called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The weathered rock material immediately beneath the solum. In most soils this material is presumed to be like that from which the overlying horizons were formed. If the material is known to be different from that in the solum, a Roman numeral precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock usually underlies a C horizon but may be immediately beneath an A or B horizon.

Mottling, soil. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of 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 these: *fine,* less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium,* ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse,* more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Parent material. Disintegrated and partly weathered rock from which soil has formed.

Ped. An individual natural soil aggregate, such as a crumb, a prism, or a block, in contrast to a clod.

Permeability. The quality of a soil horizon that enables water or air to move through it. Terms used to describe permeability are as follows: *very slow, slow, moderately slow, moderate, moderately rapid, rapid,* and *very rapid.*

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

Profile, soil. A vertical section of the soil through all its horizons and extending 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 precisely neutral in reaction because it is neither acid nor alkaline. An acid, or "sour," soil is one that gives an acid reaction; an alkaline soil is one that is alkaline in reaction. In words the degrees of acidity or alkalinity are expressed thus:

	pH		*pH*
Extremely acid	Below 4.5	Neutral	6.6 to 7.3
Very strongly acid	4.5 to 5.0	Mildly alkaline	7.4 to 7.8
Strongly acid	5.1 to 5.5	Moderately alkaline	7.9 to 8.4
Medium acid	5.6 to 6.0	Strongly alkaline	8.5 to 9.0
Slightly acid	6.1 to 6.5	Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Sand. Individual rock or mineral fragments in soils having diameters ranging from 0.05 to 2.0 millimeters. Most sand grains consist of quartz, but they may be of any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

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

Soil. A natural, three-dimensional body on the earth's surface that supports plants and that 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.

Slickens. Accumulations of fine-textured material that has been separated in placer mining or in milling ore; may be detrimental to plant growth but are usually confined in specially constructed basins.

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in mature soil includes 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 characteristic of the soil are largely confined to the solum.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. 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 (1) *single grain* (each grain by itself, as in dune sand) or (2) *massive* (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

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

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, about 5 to 8 inches in thickness. The plowed layer.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surplus runoff so that it may soak into the soil or flow slowly to a prepared outlet without harm. Terraces in fields are generally built so they can be farmed. Terraces intended mainly for drainage have a deep channel that is maintained in permanent sod.

Terrace (geological). An old alluvial plain, ordinarily flat or undulating, bordering a river, lake, or the sea. Stream terraces are frequently called second bottoms, as contrasted to flood plains, and are seldom subject to overflow. Marine terraces were deposited by the sea and are generally wide.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand*, *loamy sand*, *sandy loam*, *loam*, *silt loam*, *silt*, *sandy clay loam*, *clay loam*, *silty clay loam*, *sandy clay*, *silty clay*, and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The condition of the soil in relation to the growth of plants, especially soil structure. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable, granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Upland (geology). Land consisting of material unworked by water in recent geologic time and lying, in general, at a higher elevation than the alluvial plain or stream terrace. Land above the lowlands along rivers.

GUIDE TO MAPPING UNITS

For complete information about a mapping unit, read both the description of the mapping unit and that of the soil series to which the mapping unit belongs. For complete information about a capability unit, read both the introduction to "Use of the Soils for Crops and Pasture" and the descriptions of the capability units in this section. For information about the suitability of soils as woodland and wildlife habitat, read the introduction to these sections and refer to the tables in each section. Other information is given in tables as follows:

Acreage and extent, table 1, page 8.
Estimated yields, table 2, page 40.

Use of the soils in engineering, tables 3, 4, and 5, pages 42 through 57.

Map symbol	Mapping unit	Described on page	Capability unit		Woodland group
			Symbol	Page	
Aa	Alaga-Lucy association, undulating	8			
	Alaga soil (2 to 5 percent slopes)	--	IIIs-1	38	3s3
	Alaga soil (5 to 8 percent slopes)	--	IVs-1	38	3s3
	Alaga soil (8 to 13 percent slopes)	--	VIe-3	39	3s3
	Lucy soil (2 to 5 percent slopes)	--	IIIs-1	38	3s2
	Lucy soil (5 to 8 percent slopes)	--	IVs-1	38	3s2
	Lucy soil (8 to 12 percent slopes)	--	VIe-3	39	3s2
Ac	Alligator clay	9	IIIw-1	36	2w6
Af	Alligator clay, frequently flooded	10	Vw-1	39	3w6
Br	Barclay-Rosebloom complex, occasionally flooded	10			
	Barclay soil	--	IVw-3	38	2w5
	Rosebloom soil	--	IVw-3	38	2w9
Ca	Cadeville association, hilly	11			
	Cadeville soil (5 to 25 percent slopes)	--	VIe-2	39	3c2
	Kirvin soil (5 to 8 percent slopes)	--	IVe-1	38	3o7
	Kirvin soil (8 to 30 percent slopes)	--	VIe-1	39	3o7
	Kirvin soil (30 to 35 percent slopes)	--	VIe-1	39	3o7
	Ora soil (5 to 8 percent slopes)	--	IIIe-1	36	3o7
	Ora soil (8 to 12 percent slopes)	--	IVe-1	38	3o7
	Ora soil (12 to 20 percent slopes)	--	VIe-1	39	3o7
CdE	Cadeville fine sandy loam, 5 to 20 percent slopes	11	VIe-2	39	3c2
Cr	Crowley silt loam	12	IIIw-4	37	3w9
FrA	Frizzell silt loam, 0 to 1 percent slopes	13	IIw-2	36	2w8
FrB	Frizzell silt loam, 1 to 3 percent slopes	13	IIw-2	36	2w8
Ga	Gallion silt loam	14	I-1	35	2o4
Gu	Guyton association	15	IIIw-3	36	2w9
Gy	Guyton-Rosebloom complex, frequently flooded	15	Vw-2	39	2w9
Hb	Hebert silt loam	16	IIw-1	35	2w5
HbB	Hebert silt loam, gently undulating	16	IIw-3	36	2w5
He	Hebert complex	17	IIw-1	35	2w5
HpB	Hebert-Perry complex, gently undulating	18			
	Hebert soil	--	IIw-3	36	2w5
	Perry soil	--	IIw-3	36	2w6
Kr	Kirvin-Ruston association, rolling	18			
	Kirvin soil (5 to 8 percent slopes)	--	IIIe-1	36	3o7
	Kirvin soil (8 to 30 percent slopes)	--	VIe-1	39	3o7
	Ruston soil (5 to 8 percent slopes)	--	IVe-1	38	2o1
	Ruston soil (8 to 15 percent slopes)	--	VIe-2	39	2o1
	Cadeville soil (5 to 20 percent slopes)	--	VIe-2	39	3c2
	Ora soil (3 to 8 percent slopes)	--	IIIe-1	36	3o7
Le	Leaf silt loam, occasionally flooded	19	IVw-1	38	2w9
Ma	Made land	20	-------	--	---
MuC	Muskogee silt loam, 3 to 5 percent slopes	20	IIIe-1	36	3o7
OrD	Ora fine sandy loam, 5 to 8 percent slopes	21	IVe-1	38	3o7
OrE	Ora fine sandy loam, 8 to 12 percent slopes	21	IVe-1	38	3o7
Os	Ora-Savannah association, gently rolling	21			
	Ora soil (5 to 15 percent slopes)	--	IVe-1	38	3o7
	Savannah soil (1 to 5 percent slopes)	--	IIIe-1	36	3o7
	Cadeville soil (5 to 25 percent slopes)	--	VIe-2	39	3c2
	Providence soil (1 to 3 percent slopes)	--	IIe-2	35	2o7
	Providence soil (3 to 6 percent slopes)	--	IIIe-1	36	2o7
Pc	Perry clay, frequently flooded	22	Vw-1	39	3w6
Pe	Perry clay, occasionally flooded	23	IVw-2	38	2w6
Po	Portland silt loam	23	IIIw-2	36	2w6
Pr	Portland clay	23	IIIw-1	36	2w6
PvB	Providence silt loam, 1 to 3 percent slopes	24	IIe-2	35	2o7
PvC	Providence silt loam, 3 to 6 percent slopes	24	IIIe-1	36	2o7
RlA	Rilla silt loam, 0 to 1 percent slopes	25	I-1	35	2o4
RlB	Rilla silt loam, 1 to 3 percent slopes	25	IIe-1	35	2o4
RmB	Rilla-Hebert complex, gently undulating	25			
	Rilla soil	--	IIw-3	36	2o4
	Hebert soil	--	IIw-3	36	2w5
RsB	Ruston fine sandy loam, 1 to 3 percent slopes	27	IIe-2	35	2o1
RsD	Ruston fine sandy loam, 3 to 8 percent slopes	27	IIIe-1	36	2o1
RsE	Ruston fine sandy loam, 8 to 12 percent slopes	27	IVe-1	38	2o1
Ru	Ruston-Lucy association, undulating	28			
	Ruston soil (1 to 3 percent slopes)	--	IIe-2	35	2o1
	Ruston soil (3 to 8 percent slopes)	--	IIIe-1	36	2o1
	Lucy soil (5 to 8 percent slopes)	--	IVs-1	38	3s2
	Ora soil (5 to 8 percent slopes)	--	IIIe-1	36	3o7
	Savannah soil (1 to 5 percent slopes)	--	IIIe-1	36	3o7
Ry	Ruston-Lucy association, hilly	29			
	Ruston soil (5 to 8 percent slopes)	--	IIIe-1	36	2o1
	Ruston soil (8 to 12 percent slopes)	--	IVe-1	38	2o1
	Ruston soil (12 to 30 percent slopes)	--	VIe-1	39	2o1
	Lucy soil (8 to 25 percent slopes)	--	VIe-3	39	3s2
	Alaga soil (8 to 25 percent slopes)	--	VIe-3	39	3s3
	Ora soil (8 to 12 percent slopes)	--	IVe-1	38	3o7
SaC	Savannah fine sandy loam, 1 to 5 percent slopes	31	IIIe-1	36	3o7
StA	Sterlington silt loam, 0 to 1 percent slopes	31	I-1	35	2o4
StB	Sterlington silt loam, 1 to 3 percent slopes	31	IIe-1	35	2o4
Te	Terrace escarpments	31	-------	--	---
Wa	Waller loam	33	IIIw-3	36	2w9
Wr	Wrightsville silt loam	33	IIIw-3	36	3w9