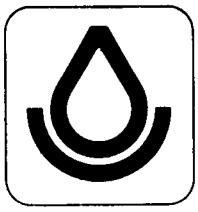
SOIL SURVEY

Shelby County Tennessee



UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
TENNESSEE AGRICULTURAL EXPERIMENT STATION

Major fieldwork for this soil survey was done in the period 1961–65. Soil names and descriptions were approved in 1966. Unless otherwise indicated, statements in this publication refer to conditions in the county in 1966. This survey was made by the Soil Conservation Service in cooperation with the Tennessee Agricultural Experiment Station. The contribution by the Soil Conservation Service is part of the technical assistance furnished to the Shelby County Soil Conservation District.

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 SOIL SURVEY contains information that can be applied in managing farms 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 Shelby County 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 shown 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 soil symbol is inside the area if there is enough room; otherwise, it is outside the area 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 in the county in alphabetic order by map symbol and shows the page where each soil is described. It also lists the capability classification of each soil.

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 section "Estimated Yields."

Foresters and others can refer to the soil descriptions for information about use of the soils as woodland.

Biologists and others interested in wildlife can refer to the soil descriptions for information about use of the soils as wildlife habitat.

Engineers and builders can find useful information in the section "Engineering Uses of the Soils."

Planners and developers will be especially interested in the section "Nonfarm Uses of the Soils."

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

Students, teachers, and other users will find information about the soils and their management in various parts of the survey, depending on their particular interest.

Newcomers in Shelby County will 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 County."

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SOIL SURVEY OF SHELBY COUNTY, TENNESSEE

BY E. C. SEASE, R. L. FLOWERS, W. C. MANGRUM, AND R. K. MOORE, SOIL CONSERVATION SERVICE

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

SHELBY COUNTY is in the southwestern corner of Tennessee (fig. 1). The county occupies an area of 480,640 acres, or 751 square miles. The average altitude is 300 feet above sea level, and the highest altitude is 400 feet, at the southeastern edge of the county.

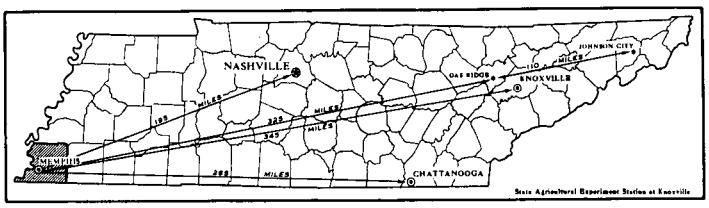

Figure 1.—**Location of Shelby County in Tennessee.**

The westernmost 10 percent of the county is on the Mississippi River flood plain, which is 185 to 230 feet above sea level. About half of the flood plain consists of islands in the Mississippi River. Some of the most fertile soils in the State are in this area. Occasional flooding and poor drainage are limitations, but the floods occur in winter and spring and the soils ordinarily dry out in time for summer annual crops to be planted. Only a small part of the flood plain is protected by a levee.

The rest of the county is gently rolling to hilly and is dissected to various degrees by creeks and rivers. The northern part, which is rolling and hilly, is dissected to a greater degree than the southern part, which is gently rolling. The bluffs along the Mississippi River flood plain are very steep. The soils in these parts of the county formed in loess ranging in thickness from about 80 feet in the bluffs to about 5 feet at the eastern edge of the county. The loess is underlain by sands and clays of the Coastal Plain. The soils range from well drained in the hills to poorly drained on the flats. All the soils are silty and easy to work, but the sloping soils erode easily when cultivated. Many of the soils have a fragipan about 2 feet below the surface. As a whole, the soils are well suited to a wide range of crops.

General Nature of the County

Shelby County was created by legislative act on November 24, 1819. It was named in honor of Isaac Shelby, once governor of Kentucky. There probably were less than 20 actual settlers within its limits, and no other settlements within 75 miles.

The early settlers of this county came mostly from middle Tennessee, but some came from North Carolina, South Carolina, and Virginia. The early pioneers settled on grants of land provided by the State of North Carolina. In 1783, a large part of the land now occupied by the city of Memphis was granted by the State of North Carolina to John Rice.

In 1960 the population of Shelby County was 627,019. Memphis, the county seat and the largest city in the State, had a population of 497,524. Whitehaven, an unincorporated town, had a population of 13,894 in 1960. Other incorporated towns, and their population in 1960, are Millington, 6,059; Collierville, 2,020; Germantown, 1,104; Arlington, 620; and Bartlett, 508.

About 20 percent of the county is occupied by the city of Memphis. In 1960 the area of Memphis was approximately 140 square miles, or almost 90,000 acres.

The population of both Memphis and Shelby County has more than doubled since 1930. Planners predict a county population of 1,000,000 by 1980.

Shelby County is chiefly an industrial county, although agriculture furnishes a large amount of the total income. Industrial districts occupy approximately 17,000 acres, and there are, in addition, various individual sites.

Most of the industries are in the city of Memphis and the suburban areas. The industrial economy of Memphis is varied. It includes chemicals, wood products, farm machinery, tires, foods, paper products, pharmaceuticals, soybean and cottonseed oil derivatives, and fertilizers. Between 1946 and 1963, over 600 new industries located in this area.

Shelby County is served by eight trunkline railroads, which offer direct one-line service to 25 states. Eight commercial airlines provide more than 150 incoming and departing flights daily at Memphis Metropolitan Airport. Five barge lines operate scheduled service to all navigable points on the Mississippi, Missouri, Ohio, and secondary rivers, and to shipside at the Gulf of Mexico. Ninety-one motor freight lines serve Memphis and the Shelby County area and offer overnight service to such points as Atlanta, New Orleans, Birmingham, Knoxville, Nashville, Little Rock, and St. Louis and to intermediate points. Ten Federal highways, including two in the National Interstate system (fig. 2), serve Memphis. The area is served by 12 bus lines.

Figure 2.—**Highway I-40, 5 miles east of the city limits of Memphis. Superhighways like this take large areas that once were farms.**

The 2,052 farms in Shelby County take up 273,387 acres, or 56.6 percent of the land area. The average acreage per farm is 133.2 acres. Farms 10 to 49 acres in size are the most common. There are 992 farms in this size range and 266 farms less than 10 acres in size. There are few farms more than 500 acres in size, but there are 394 farms between 100 and 500 acres in size.

Most of the farms in the county are listed as field-crop farms, with cotton farms and miscellaneous and unclassified farms following closely. Livestock, cash-grain, general, and dairy farms follow in the order given. Soybeans were grown on 51,393 acres; cotton, on 33,728 acres; and corn, on 12,135 acres, in 1964. Vegetable crops, though not extensive in acreage, are important.

Annual lespedeza and alfalfa are the leading hay crops. They generally are fed on the farm, not sold as hay.

Unimproved pastures consist mostly of common lespedeza. Improved pastures consist mostly of tall fescue, white clover, and common bermudagrass.

Shelby County has a complete drainage system. All of the surface runoff flows into the Mississippi River. Nonconnah Creek and the Wolf River are the major drains in the southern part of the county. Big Creek and the Loosahatchie River are the major drains in the northern part of the county.

Climate [1]

The climate of Shelby County, like that of much of Tennessee and of surrounding areas, is characterized by relatively mild winters, hot summers, and abundant rainfall. Although the county is well inland from large bodies of water, it lies in the path of cold air moving down from Canada and warm, moist air moving up from the Gulf of Mexico. Consequently, extreme and frequent changes in the weather, both from day to day and from season to season, are common.

Although the weather varies daily within the county, differences in altitude are not great enough to cause significant differences in climate. Therefore, the climate data for Memphis in table 1 are representative of the entire county, except that precipitation decreases slightly from east to west. The difference between the total annual precipitation in the eastern part of the county and that in the western part is about 2 inches.

TEMPERATURE.—The average annual temperature at Memphis is 62° F. Extremes of 106° and —11° occurred during the period 1931 through 1960. Prolonged periods of very cold or very hot weather are unusual. Occasional

[1] By JOHN VAIKSNORIS, State climatologist, U.S. Weather Bureau, Nashville, Tennessee.

TABLE 1.—*Temperature and precipitation*

[All data from Memphis, Shelby County, Tenn., elevation 263 feet, latitude 35°03′ N., longitude 89°59′ W. Period of record, 1931 through 1960]

Month	Temperature [1]				Precipitation [2]			
	Average daily maximum	Average daily minimum	Two years in 10 will have at least 4 days with—		Average total	One year in 10 will have—		Average snowfall
			Maximum temperature equal to or higher than—	Minimum temperature equal to or lower than—		Less than—	More than—	
	°F.	°F.	°F.	°F.	*Inches*	*Inches*	*Inches*	*Inches*
January	50. 6	33. 4	69	17	6. 07	1. 7	9. 9	1. 9
February	53. 9	35. 3	70	21	4. 69	2. 0	8. 2	1. 0
March	61. 4	41. 7	77	27	5. 07	2. 5	8. 9	. 3
April	72. 1	51. 7	84	39	4. 63	1. 9	8. 1	0
May	81. 1	60. 4	91	50	4. 23	1. 2	7. 3	0
June	89. 3	68. 6	97	60	3. 68	1. 4	6. 6	0
July	92. 1	71. 5	99	65	3. 54	1. 6	6. 4	0
August	91. 7	70. 3	99	64	2. 97	1. 1	6. 1	0
September	85. 6	63. 1	95	52	2. 82	1. 0	5. 8	0
October	75. 7	51. 5	88	38	2. 72	. 9	5. 2	0
November	61. 5	39. 7	76	26	4. 38	1. 6	6. 9	. 1
December	52. 5	34. 5	68	20	4. 93	1. 9	7. 8	. 6
Year	72. 3	51. 8	(3) 100	(3) 11	49. 73	38. 4	58. 3	3. 9

[1] Temperature data through March 1941 are from the city station, and data for the period thereafter are from the Memphis Airport station. Temperatures were measured in standard Weather Bureau instrument shelters with thermometers 4.5 feet above ground. On clear, calm nights, the shelter-level temperature usually is about 5 degrees higher than the temperature near the ground and may be as much as 12 degrees higher.

[2] Precipitation data through 1950 are from the city station, and data for the period thereafter are from the Memphis Airport station.

[3] Average of annual extremes.

periods of very mild weather occur almost every winter, and during the summer occasional periods of dry and cool weather break up stretches of hot and humid weather. The greatest change in the average daily maximum and minimum temperatures occurs from October to November, when outbreaks of cold air start moving downward across the area.

The average dates of the last freezing temperature in spring and of the first freezing temperature in fall are March 20 and November 12, respectively, according to Memphis records. The interval between these dates is the growing season. The growing season, or frost-free period, lasts 238 days on the average.

The probability of a freezing temperature occurring in spring after a given date, and in fall before any given date, can be determined from figure 3. To determine, for example, a date in spring after which there is a 75 percent probability of the occurrence of a temperature of 28° F. or less, locate the vertical line marked "75 percent" at the top of the graph and follow it downward until it intersects the line marked "28° F. Spring;" then follow the horizontal line from the point of intersection to the margin on the right. The date is February 23. To determine the date in fall before which there is a selected probability of a freezing temperature, read upward from the bottom of the graph to the desired fall temperature line and then to the left margin for the date.

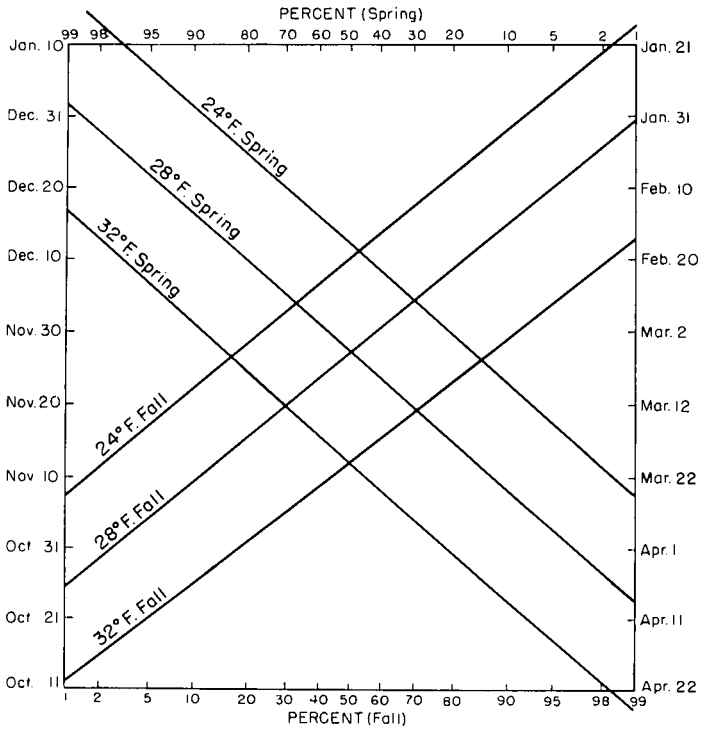

Figure 3.—**Probability (in percent) of given temperatures occurring in spring after any date (top scale) and in fall before any date (bottom scale) at Memphis, Shelby County, Tenn.**

The growing season, or freeze-free period, is long enough to permit planting of cotton, soybeans, corn, vegetables, and similar crops over a period of a few weeks and still give them time to mature. The winters are usually mild enough that fall-sown small grains survive and furnish considerable grazing for livestock during the winter months. There are many days during winter when the temperature is above 40° F. and pasture grasses make substantial growth.

PRECIPITATION.—Shelby County usually has adequate moisture for agricultural uses and sufficient water for other uses. The total annual rainfall at Memphis during the period 1931 through 1960 ranged from 30.54 inches, in 1941, to 76.85 inches, in 1957. Normally, precipitation is heaviest in winter and early in spring, a period when low-pressure systems cause widespread rains. A second period of heavy precipitation occurs late in spring and early in summer, when local showers and thunderstorms are most common. Precipitation is generally lightest late in summer and early in fall.

Heavy local rainstorms frequently drop more than 4 inches of precipitation. Maximum amounts of precipitation in a 24-hour period at nearby locations have been more than 5 inches. The highest total monthly precipitation recorded at Memphis during the period 1931 through 1960 is 17.56 inches for January 1937, the month of the great Mississippi Valley flood.

WATER BALANCE.—Figure 4 shows the average water balance at Memphis, Tenn. Through the use of curves for average monthly precipitation, for potential evapotranspiration, and for actual evapotranspiration, figure 4 shows moisture conditions in the soils at the end of each month during an average year. Computations for figure 4 are by the Thornthwaite method (*4*)[2]. The available moisture at fixed capacity is assumed to be 4 inches per foot of soil.

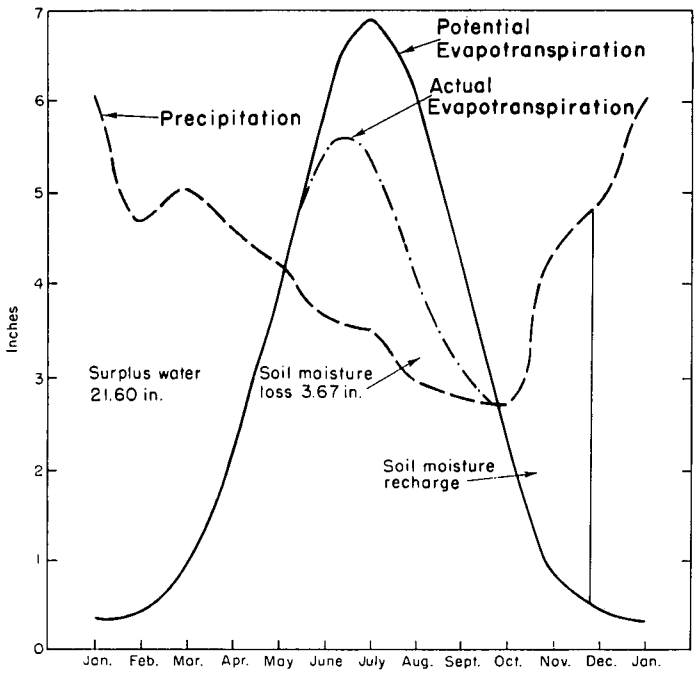

Figure 4.—**Average water balance at Memphis, Shelby County, Tenn., computed from data recorded from 1931 through 1960.**

From mid-October through the first few days of June, figure 4 shows that precipitation exceeds estimated actual evapotranspiration. From early in June through most of October, estimated actual evapotranspiration exceeds precipitation. Near the end of October, 3.67 inches of the original 4 inches of available water has been removed from the soil. Then precipitation again exceeds evapotranspiration, and replacement of moisture lost during the summer begins. This replacement is completed near the end of November, and again precipitation exceeds evapotranspiration. This excess precipitation is lost by the soil through surface or subsurface runoff.

The average moisture conditions shown in figure 4 are for the end of each month, but there are shorter periods of variation that are not shown. For example, usually the soil is dry enough to be cultivated for a few days between rains early in spring, when precipitation exceeds evapotranspiration. Moisture conditions vary considerably from year to year because of variation in rainfall, temperature, and other factors.

The rate of plant growth is affected greatly by the amount of available moisture in the soil. The vertical distance between the actual and the potential evapotranspiration curves indicates the amount of irrigation needed to maintain maximum plant growth. The moisture deficit results because the amount of precipitation during summer is not enough to replace moisture lost by evaporation or to meet the needs of actively growing plants.

SEVERE STORMS.—Severe storms are infrequent in Shelby County. Only six tornadoes were reported in the county between 1916 and 1964. Hailstorms occur about once or twice a year in any one place. Thunderstorms occur on about 51 days per year. Minor windstorms, which are often associated with thunderstorms, cause scattered damage locally a few times each year. The county is too far inland to be damaged by tropical storms. Heavy snowstorms are infrequent, and snow during winter seldom remains on the ground for more than a few days.

HUMIDITY, WIND, AND CLOUDS.—The average annual relative humidity is about 70 percent. The highest daily averages occur in winter, and the lowest in spring. Relative humidity throughout the day usually varies inversely as the temperature and is, therefore, highest early in the morning and lowest early in the afternoon.

The prevailing winds during the year are from the south. The average monthly windspeed varies from about 7 miles per hour in August to about 11 miles per hour from January through April. Windspeed is about 3 miles per hour or lower about 14 percent of the time, 4 to 12 miles per hour about 60 percent of the time, 13 to 24 miles per hour about 25 percent of the time, and 25 miles per hour or higher about 1 percent of the time. Windspeed is usually lowest early in the morning and highest early in the afternoon.

[2] Italic numbers in parentheses refer to Literature Cited, p. 51.

Clouds cover less than six-tenths of the sky, on the average, between sunrise and sunset. Annually, the part of the sky that is covered ranges from about seven-tenths in January to about four-tenths in October. During the growing season, clouds usually cover less than three-tenths of the sky; thus, sunshine is abundant.

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soils are in Shelby County, where they are located, and how they can be used.

They went into the county knowing they likely would find many soils they had already seen, and perhaps some they had not. As they traveled over the county, they observed steepness, length, and shape of slopes; size and speed of streams; kinds of native plants or crops; kinds of rock; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the underlying material that has not been changed much by leaching or by roots of plants.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. To use this publication efficiently, it is necessary to know the kinds of groupings most used in a local soil classification (*6*).

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, the major horizons of all the soils of one series are similar in thickness, arrangement, and other important characteristics. A soil series is usually named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Memphis and Grenada, 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 natural, undisturbed landscape. Soils of one series can differ somewhat in texture of the surface soil and in slope, stoniness, or some other characteristic that affects use of the soils by man.

Many soil series contain soils that differ in texture of their surface layer. According to such differences in texture, separations called soil types are made. Within a series, all the soils having a surface layer of the same texture belong to one soil type. Robinsonville fine sandy loam and Robinsonville silt loam are two soil types in the Robinsonville series. The difference in texture of their surface layers is apparent from their names.

Some soil types vary so much in slope, degree of erosion, number and size of stones, or some other feature affecting their use, that practical suggestions about their management could not be made if they were shown on the soil map as one unit. Such soil types are divided into phases. The name of a soil phase indicates a feature that affects management. For example, Memphis silt loam, 2 to 5 percent slopes, eroded, is one of several phases of Memphis silt loam, a soil type that has a slope range of 2 to 65 percent.

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 greatly help in drawing boundaries accurately. The soil map at 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 management of farms and fields, a mapping unit is nearly equivalent to a soil type or a phase of a soil type. 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 type or soil phase.

In preparing some detailed maps, the soil scientists have a problem of delineating areas where soils of different series or of different types within a series are so intricately mixed or occur in individual areas of such small size that it is not practical to show them separately on the map. They show such a mixture of soils as one mapping unit and call it a soil complex. Grenada complex, 5 to 12 percent slopes, severely eroded, is an example.

Most surveys include areas where the soil material is so rocky, so shallow, or so frequently worked by wind and water that it cannot be classified by soil series. These areas are shown on the map like other mapping units but are given descriptive names, such as Swamp or Gullied land, and are called land types.

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 soils 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 all 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 readers, among them farmers, managers of woodland, engineers, realtors, and homeowners. Grouping soils that are similar in suitability for each specified use is the method of organization commonly used in the soil survey. The soil scientists set up trial groups based on the yield and practice tables and on other data. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others; then, they adjust the groups according to the results of their studies and consultation. 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 in the pocket inside the back cover of this survey shows, in color, the soil associations in Shelby County. 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 a county, who want to compare different parts of a county, or who want to know the location of large tracts that are suitable for a certain kind of farming or other land use. Such a map is not suitable for planning the management of a farm or field, because the soils in any one association ordinarily differ in slope, depth, stoniness, drainage, and other characteristics that affect management.

The seven soil associations in Shelby County are described briefly in this section. The terms for texture used in the titles of the associations apply to the surface layer. For example, in the title of association 1, the terms "loamy and sandy" refer to the texture of the surface layer. More detailed information about the individual soils in each association can be obtained by studying the detailed soil map and by reading the section "Descriptions of the Soils."

1. *Robinsonville-Crevasse-Commerce association*

Nearly level, excessively drained to somewhat poorly drained, loamy and sandy soils on first bottoms along the Mississippi River

This association is part of the flood plain of the Mississippi River. It occurs near the bank of the river and near recent meanders. It also includes parts of large islands in the river. Most areas are flooded about once every 4 or 5 years. The total extent is approximately 12,000 acres, or about 3 percent of the county. About 50 percent of this acreage consists of Robinsonville soils; 25 percent, of Crevasse soils; and 20 percent, of Commerce soils. A few small, low-lying areas of Sharkey and Tunica soils make up the remaining 5 percent.

The soils in this association consist of sediment laid down by the Mississippi River. The coarser textured and better drained soils are near the river; the more clayey and more poorly drained soils are more distant from the river. Robinsonville soils are well drained and are loamy to a depth of 3 feet or more. Crevasse soils are along the riverbank. They are sandy to a depth of 5 feet or more and are excessively drained. Commerce soils are somewhat poorly drained and have gray and brown mottles below a depth of about 15 inches. Sharkey and Tunica soils are minor parts of this association. They are in low places where water stands. There are a few lakes and a few swampy areas, which appear to be segments of former river channels.

More than half of this association has been cleared. The remaining tracts of woodland are in the wettest places and in the sandy areas. Nearly all of the cleared acreage is cultivated every year. Cotton and soybeans are the main crops. Most of the acreage is in a few large farms, and most of the farms are operated by tenants. Few landowners or tenants live in this area.

The soils in this association are among the most fertile in the county. They are well suited to many crops. Flooding is the main limitation. It sometimes necessitates planting late in the season, but seldom late enough to affect yields. Only a small part of this association is protected by levees.

In their natural state, most areas of this association are subject to flooding and for this reason are poorly suited to residences, to most industries, and to transportation facilities. Part of this association is within the city limits of Memphis. One area on Presidents Island has been covered to a depth of about 20 feet by sand pumped from McKellar Lake. This area is well suited to industrial uses, since it is now above flood stage.

2. *Tunica-Sharkey-Bowdre association*

Level, dark-colored, poorly drained to moderately well drained, clayey soils on low flood plains of the Mississippi River

This association is in some of the lowest parts of the Mississippi River flood plain. It is made up of low, broad flats that drain very slowly. Some of the flats appear to be old river channels that have been filled with clay and silt. The lowest parts of the association are wooded. They are under a few inches of water nearly all winter and spring and are heavily infested with mosquitoes. By the early part of summer, the water has seeped or drained from all except the lowest areas. A levee has been constructed to protect about 6,000 acres in the southwestern corner of the county, but most of the association is subject to flooding almost every year. The total extent of this association is about 30,000 acres, or about 7 percent of the county. About 40 percent of this acreage consists of Tunica soils; 35 percent, of Sharkey soils; 15 percent, of Bowdre soils; and the rest, of several soils and land types, each of small acreage.

The soils in this association formed in clay sediment deposited by still and slowly moving water. Tunica soils are dark colored, very sticky, and clayey to a depth of 20 to 36 inches. They are somewhat poorly drained. Sharkey soils are in the lowest areas and are poorly drained. They are dark colored, very sticky, and clayey to a depth of 3 feet or more. Bowdre soils are very similar to Tunica and Sharkey soils, but the clayey layer is less thick and drainage is somewhat better. Bowdre soils consist of 10 to 20 inches of clayey material over coarser textured material. There are many swampy areas and a few lakes, both of which appear to be old river channels.

About three-fourths of this association is wooded. The trees are mainly hardwoods, but there are many cypress trees in the swampy areas. On the cleared acreage, the main crop is soybeans. Corn and small grain are grown on only a small acreage. Some cotton is grown, but most areas dry out too late to be suitable for cotton. Most of the acreage is in a few large farms. Probably because of floods, few if any landowners or tenants live in the area. A large part of Shelby Forest State Park is in this association.

The soils in this association have a moderate potential for agricultural use. Flooding and standing water are the main limitations. The lowest areas are swampy and too wet for crops. The higher and drier Bowdre soils are suited to soybeans and other summer annual crops, but

the more poorly drained Sharkey and Tunica soils can be used only if artificially drained. Only the higher areas dry out early enough to be planted to cotton or corn. The soils are fertile but are hard to work. They are productive of pasture but are too wet for grazing in winter and spring. Trees grow well on these soils.

Poor stability, frequent flooding, and a high water table limit the suitability of the soils of this association for residential, industrial, and transportational uses. The areas are suitable for hunting and fishing.

3. *Memphis association*

Chiefly steep, well-drained, silty soils on uplands

This association is characterized by hills and ridges that rise abruptly from the Mississippi River bottoms to a height of about 200 feet. The long, steep hillsides are conspicuous; they have a slope range of 15 to 65 percent. The ridgetops are narrow and winding. Long, crooked drains have formed deep, narrow hollows. The level strips in the hollows are seldom more than 200 feet wide. The total extent of this association is about 48,000 acres, or about 10 percent of the county. About 75 percent of this acreage consists of Memphis soils; the rest, of Adler and Convent soils.

Memphis soils are on the ridgetops and hillsides. They formed in windblown silt deposits 4 to 80 feet thick. They have a brown, silty surface layer and subsoil. Adler and Convent soils are on the narrow, level strips in the hollows. They have a brown surface layer and are silty to a depth of several feet. Adler soils are mottled with gray and brown below a depth of about 18 inches; Convent soils are uniformly gray below a depth of about 26 inches.

About 80 percent of this association is wooded. Nearly all of the cleared acreage is on the ridgetops and in the hollows. Most farms are between 35 and 75 acres in size, and most are made up of wooded areas on hillsides and small patches of cleared land on ridgetops and in hollows. Part of Shelby Forest State Park and part of T. O. Fuller State Park are in this association.

Except for the small, narrow ridgetops and the hollows, this association is not well suited to farming. The steep soils on the hillsides are fertile but are subject to landslides and gullying if cleared and cultivated. Trees grow well, and so do plants that provide food and cover for wildlife.

This association has serious limitations for residential or industrial development, because the soils are subject to slipping and sliding if cuts are made in hillsides. Most areas are somewhat too hilly for recreational uses except hunting, camping, and hiking.

4. *Memphis-Grenada-Loring association*

Nearly level to sloping, well drained and moderately well drained, silty soils on broad uplands

This association is mainly in the northern and central parts of the county. It is characterized by broad, rolling, low-lying hills, the sides of which are dissected by numerous small drainageways. The tops of the hills are nearly level and fairly wide; many form fields 20 to 50 acres in size. The slope of the hillsides ranges from 5 to 30 percent. The total extent is about 190,000 acres, or about 40 percent of the county. About 35 percent of this acreage consists of Memphis soils; 15 percent, of Grenada soils; 14 percent, of Loring soils; 20 percent, of Graded land and Filled land; 2 percent, of Gullied land; and the rest, of other minor soils.

The soils in this association developed in silty deposits more than 20 feet thick. Memphis soils are on the broader ridgetops and the steeper hillsides. They are well drained. They have a brown, silty surface layer and subsoil. Grenada soils are commonly on nearly level ridgetops and sloping hillsides. They have a surface layer of brown silt loam and a subsoil of yellowish-brown silt loam. A fragipan begins at a depth of 15 to 30 inches. Loring soils are on ridgetops and hillsides. They have a brown, silty surface layer and a subsoil of dark-brown silt loam. A weak fragipan begins at a depth of about 28 inches.

Collins and Falaya soils, minor soils in this association, are on narrow bottoms. They consist mainly of recent sediments over old, poorly drained, silty soils. Small areas of poorly drained Henry soils and somewhat poorly drained Calloway soils are at the heads of small drainageways. Graded land and Filled land are within and near the city of Memphis. These are areas that have been leveled by grading down the ridges and filling in the low places so they can be used as building sites.

Most of this association has been cleared. About 80 percent of the city of Memphis, which occupies a total of about 90,000 acres, is in this association. There are many full-time general farms and several dairy farms and beef farms. There are also many city farms, less than 20 acres in size, which are not farmed primarily as businesses. Cotton and soybeans are the main cash crops on the larger farms. These crops are supplemented with corn and livestock.

Most of the soils in this association are suited to row crops. The more strongly sloping, more severely eroded hillsides are suited to pasture or hay. A few areas are so steep or so eroded that their use is limited to tree production. Nearly all farms in this association have soils that are well suited to row crops grown in rotation with hay and pasture and, consequently, are well suited to general farming.

There are only a few streams in this association. Most of the water for livestock comes from ponds (fig. 5) and wells.

The major soils of this association are suited to a wide variety of urban uses. Only a few small areas have major limitations.

5. *Falaya-Waverly-Collins association*

Level, poorly drained to moderately well drained, silty soils on first bottoms

This association is characterized by long, wide, flat bottoms along streams that meander through the rolling uplands. The areas are about 1 mile wide near the mouth of the streams, but they diminish into narrow valleys in the uplands. The total extent of this association is approximately 96,000 acres, or about 20 percent of the county. About 55 percent of this acreage consists of Falaya soils;

351-025—70——2

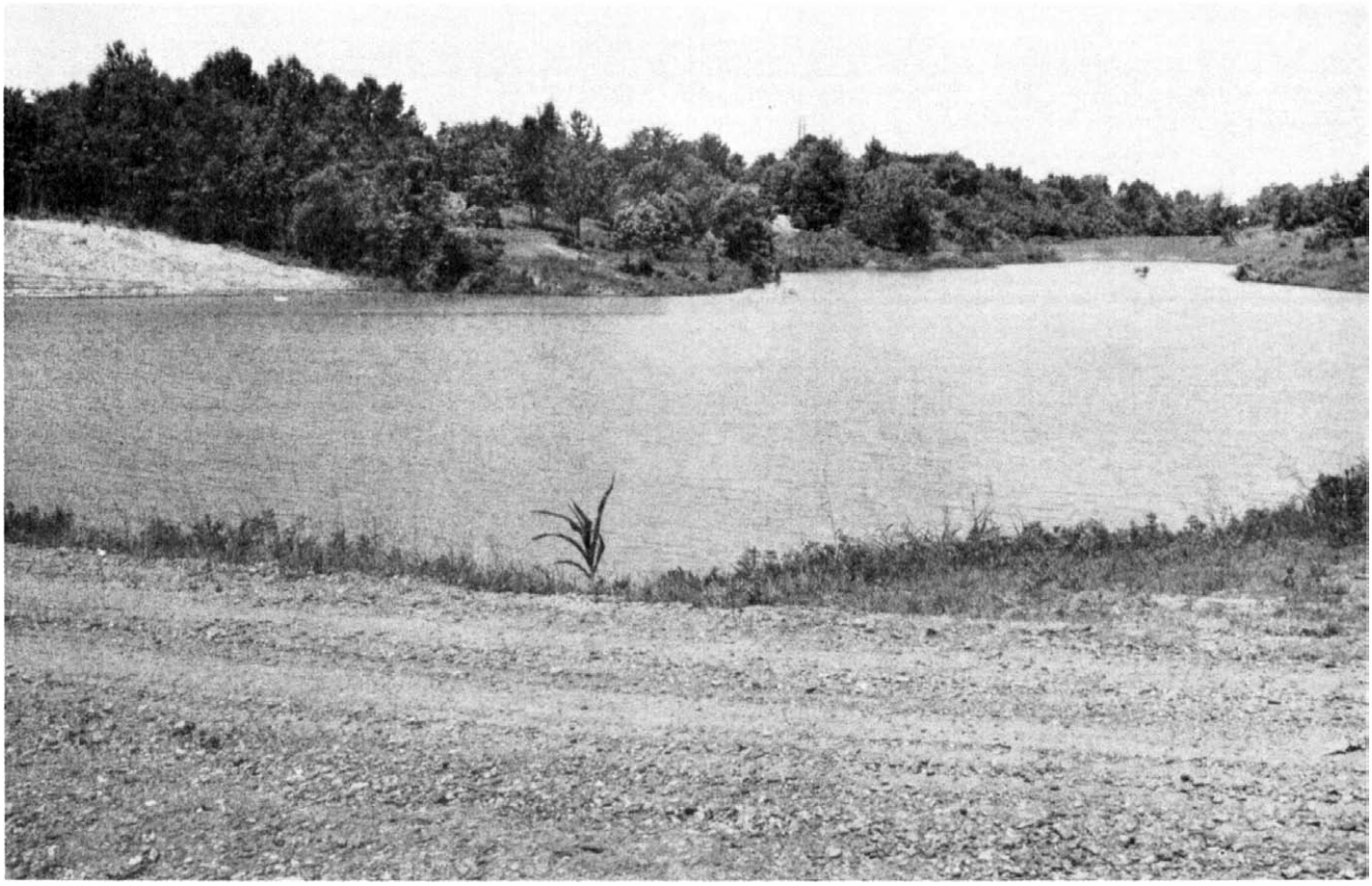

Figure 5.—**A pond in association 4, which has many good pond sites. Ponds furnish most of the water for livestock in this association.**

20 percent, of Waverly soils; 15 percent, of Collins soils; and the rest, of Calloway and Henry soils.

The soils of this association consist mostly of medium acid and strongly acid soil material washed down from the surrounding uplands. Falaya soils have a surface layer of brown silt loam and a mottled subsoil. Waverly soils are dark grayish brown and poorly drained. They are in low areas from which water drains away slowly. Collins soils are mostly on the better drained strips near the stream channels and ditchbanks. They have a surface layer of brown silt loam and are mottled with gray and brown below a depth of about 18 inches.

About 80 percent of this association has been cleared. Most of the better drained areas have been cleared and are cultivated each year. Most of the poorly drained areas are wooded. The soils are fertile and are well suited to some crops. Cotton and corn are grown on the better drained cleared sites; soybeans and pasture are grown on the less well drained sites. Most of the farmland is part of farms that extend down from the uplands. The farms are generally 200 acres or more in size. These are full-time general farms on which cotton, soybeans, and corn are the main cash crops. Near the city limits are smaller truck farms on which vegetable crops are grown.

The large areas of nearly level, uniform slopes are suitable for the use of large farm machinery. The better drained soils are suited to a wide range of crops and can be used intensively for summer annuals.

Flooding and standing water are the main limitations. Floods are not a serious threat to summer crops, since most floods occur in winter. Floodwater ranges from a few inches to several feet in depth, and flooding usually lasts 1 to 3 days. Flooding is more frequent and of longer duration in the lower areas, which are generally occupied by Waverly soils. In some areas removal of floodwater is impeded by road levees, lack of outlets to main channels, or clogged outlets. If drainage channels are provided (fig. 6), water normally drains away before the planting season.

Poor drainage, a high water table, and susceptibility to flooding are limitations in the use of the soils for residences, industrial buildings, and transportation facilities.

6. *Grenada-Calloway-Henry association*

Gently sloping to nearly level or depressional, moderately well drained to poorly drained, silty soils on uplands

This association is characterized by broad ridgetops and short side slopes on a rather smooth landscape. It is in the southern and southeastern parts of the county and adjacent to the bottom land on the north side of the

Figure 6.—**Drainage channel, dug to replace meandering ditches that originally drained association 5.**

Loosahatchie River. The total extent is about 48,000 acres, or about 10 percent of the county. About 50 percent of this acreage consists of Grenada soils; 15 percent, of Calloway soils; 10 percent, of Henry soils; and the rest, of Falaya, Collins, Memphis, Loring, and Bonn soils and a few small areas of Gullied land.

The soils in this association formed in silty deposits 5 to 20 feet thick. Grenada soils are on the gently sloping ridgetops and sloping hillsides. They have a surface layer of brown silt loam and a subsoil of yellowish-brown silt loam. A fragipan begins at a depth of 15 to 30 inches. Calloway and Henry soils are nearly level or depressional. Calloway soils are somewhat poorly drained and have a surface layer of brown or dark grayish-brown, friable silt loam and a subsoil of yellowish-brown, friable silt loam mottled with gray. A fragipan begins at a depth of 15 to 25 inches. Henry soils are poorly drained. They have a surface layer of brown or gray, very friable silt loam and, at a depth of about 18 inches, a subsoil of compact, mottled silt loam. Falaya and Collins soils are on the adjacent bottom lands.

Nearly all of this association has been cleared, but a few woodlots remain on the wettest areas. Most of the farms are full time and of the general type, but there are several dairy farms and beef farms. Pleasure horses are bred and raised on several farms in this area. A few large nurseries are located in this association. Cotton, the main cash crop, is supplemented with other row crops, such as soybeans and corn. Most farms have tenants.

Most of the soils in this association are suited to row crops. The more strongly sloping, more severely eroded soils on hillsides are better suited to pasture or hay. Nearly all farms in this association have soils that are suited to row crops grown in rotation with hay and pasture and, consequently, are well suited to general farming. Seasonal wetness is a problem on the nearly level areas; erosion is a problem on the more sloping areas.

Seasonal wetness of some of these soils is perhaps the main limitation to nonfarm uses. Areas not affected by wetness and a seasonal high water table can be used for residential and light industrial development.

7. *Grenada-Memphis-Loring association*

Gently sloping to strongly sloping, moderately well drained and well drained, silty soils on uplands

This association is in the eastern and east-central parts of the county. It is characterized by moderately broad ridges and short side slopes. The short hillsides have a slope range of 5 to 20 percent. They end on the bottom lands of small winding drainageways, about 25 to 35 feet below the ridgetops. There are many of these small drainageways. The valleys are narrow at the heads of the drainageways but broaden rapidly downstream. The

total extent of this association is approximately 48,000 acres, or about 10 percent of the county. About 50 percent of this acreage consists of Grenada soils; about 12 percent, of Memphis soils; about 8 percent, of Loring soils; and most of the rest, of Calloway, Collins, Falaya, and Henry soils.

The soils in this association formed in silt deposits 5 to 30 feet deep.

Grenada soils are commonly on nearly level ridgetops and sloping hillsides. They have a surface layer of brown silt loam, a subsoil of yellowish-brown silt loam, and a fragipan at a depth of 15 to 30 inches. Memphis soils are on the narrower ridgetops and steeper hillsides. They are well drained. They have a surface layer of brown silt loam and a subsoil of brown to reddish-brown silty clay loam or silt loam. Loring soils are on ridgetops and hillsides and are moderately well drained. They have a surface layer of brown silt loam, a subsoil of brown to dark-brown silt loam or heavy silt loam, and a weak fragipan at a depth of 12 to 30 inches. Collins and Falaya soils are on small bottoms, adjacent to Loring soils. Henry and Calloway soils are in small areas at the heads of small drainageways and on upland flats.

About 75 percent of this association has been cleared. Most of the remaining woodland is on the steeper slopes. The severely eroded steeper slopes are idle or in pasture. There are many full-time general farms about 25 acres in size, and several dairy farms and beef farms. Cotton, soybeans, and corn are the main crops.

The gently sloping soils in this association are suited to row crops. The more strongly sloping, more severely eroded soils on hillsides are better suited to pasture or hay than to crops. A few areas are so steep or so severely eroded that only trees can be grown. Nearly all farms in this association have soils that are well suited to row crops grown in rotation with hay and pasture. Since there are only a few running streams in this association, most of the water comes from ponds and wells. There are many ponds, and they range from 1 to 6 acres in size.

Many sites in this association are suited to residential and industrial development.

Descriptions of the Soils[3]

In this section the soils of Shelby County are described in detail. The procedure is to describe first a soil series and then the mapping units in that series. The description of each soil series consists mainly of a description of a profile that is considered representative of all the soils of the series. This profile description is detailed enough that scientists, engineers, and others can use it in making highly technical studies and interpretations.

To get full information on any one mapping unit, it is necessary to read both the description of that unit and the description of the soil series to which the unit belongs. The descriptions of the mapping units give the characteristics and qualities of each soil. They also discuss the use of the soils for crops and pasture, for woodland, for wildlife, and for lawns and shrubs. The capability classification of each mapping unit is given at the end of the description. The capability classification system is explained on page 36.

As explained in the section "How This Survey Was Made," a few of the mapping units, Swamp and Gullied land, for example, are not part of any soil series, but they are listed in alphabetic order along with the soil series.

The detailed soil map at the back of this survey shows the location and distribution of the mapping units, and the "Guide to Mapping Units" gives the page on which each is described. The approximate acreage and proportionate extent of each mapping unit are shown in table 2. Many terms used in describing the soil series and mapping units are defined in the Glossary, and some are defined in the section "How This Survey Was Made."

Adler Series

This series consists of deep, moderately well drained, neutral, silty soils on narrow bottoms and on the outer edge of the Mississippi River flood plain. These soils formed in recent deposits of silt washed from the steep loess hills.

Representative profile of Adler silt loam, one-fourth mile west of Herring Hill Road, at the foot of the bluff on the Mississippi River bottoms:

Ap—0 to 8 inches, brown (10YR 4/3) silt loam; weak, fine, granular structure; very friable; common roots; neutral; gradual, smooth boundary.

C1—8 to 18 inches, brown (10YR 4/3) silt loam; few, fine, faint, pale-brown mottles; structureless; friable; few roots; neutral; clear, smooth boundary.

C2—18 to 32 inches, brown (10YR 5/3) silt loam; common, medium, distinct, light brownish-gray mottles and few, fine to medium, dark reddish-brown mottles; structureless; thin horizontal bedding planes; friable; very few roots; neutral; clear, smooth boundary.

C3—32 to 46 inches, brown (10YR 5/3) silt loam; many, fine, distinct, dark yellowish-brown mottles and few, fine, very dark grayish-brown mottles; structureless; friable; neutral; clear, smooth boundary.

IIA1b—46 to 56 inches, very dark grayish-brown (2.5Y 3/2) silty clay loam; common, fine, distinct, dark yellowish-brown mottles; massive; slightly sticky when wet; neutral.

The color of the surface layer ranges from dark grayish brown to brown. In places the depth to the IIA1b horizon is more than 4 feet.

Adler silt loam (Ad).—This is a deep, fertile soil on bottom lands. It consists of 3 to 5 feet of brown silt loam sediment that was washed from nearby steep, bluff-like hills. It is moderately well drained, but a few gray mottles below a depth of 18 inches indicate wetness.

Included in mapping were some small areas that are free of mottles to a depth of 24 inches, and some areas that have gray mottles at a depth of less than 18 inches.

This soil is high in content of phosphorus and potassium. It does not need lime, since it is neutral in reaction. It is easy to work and to keep in good tilth. The available water capacity is very high. Roots, water, and air

[3] C. H. JENT, assistant State soil conservationist, C. M. HENNINGER, woodland conservationist, and FLOYD R. FESSLER, biologist, Soil Conservation Service, assisted in the preparation of this section.

TABLE 2.—*Approximate acreage and proportionate extent of the soils*

Soil	Acres	Percent
Adler silt loam	750	0.2
Bonn silt loam	235	(1)
Bowdre silty clay	5,670	1.2
Calloway silt loam	15,580	3.2
Collins silt loam	22,000	4.6
Commerce silt loam	4,030	.8
Convent silt loam	2,475	.5
Crevasse fine sand	3,320	.7
Crevasse silt loam	620	.1
Falaya silt loam	82,775	17.1
Filled land, silty	9,700	2.0
Filled land, sandy	2,160	.4
Grenada silt loam, 0 to 2 percent slopes	570	.1
Grenada silt loam, 2 to 5 percent slopes	31,320	6.5
Grenada silt loam, 2 to 5 percent slopes, eroded	9,045	1.9
Grenada silt loam, 5 to 8 percent slopes	900	.2
Grenada silt loam, 5 to 8 percent slopes, severely eroded	19,900	4.1
Grenada silt loam, 8 to 12 percent slopes	1,300	.3
Grenada silt loam, 8 to 12 percent slopes, eroded	10,200	2.1
Grenada complex, 5 to 12 percent slopes, severely eroded	11,235	2.3
Graded land, silty materials	40,275	8.3
Gullied land, silty	9,270	2.0
Henry silt loam	10,235	2.1
Iberia silt loam	800	.2
Levees and Borrow Pits	920	.2
Loring silt loam, 2 to 5 percent slopes	11,630	2.4
Loring silt loam, 2 to 5 percent slopes, eroded	3,110	.6
Loring silt loam, 5 to 8 percent slopes, eroded	4,100	.9
Loring silt loam, 8 to 12 percent slopes	560	.1
Loring silt loam, 8 to 12 percent slopes, eroded	3,260	.7
Loring silt loam, 5 to 12 percent slopes, severely eroded	1,935	.4
Memphis silt loam, 2 to 5 percent slopes	46,360	10.0
Memphis silt loam, 2 to 5 percent slopes, eroded	6,100	1.3
Memphis silt loam, 5 to 8 percent slopes, eroded	5,810	1.2
Memphis silt loam, 8 to 12 percent slopes, eroded	8,540	1.8
Memphis silt loam, 5 to 12 percent slopes, severely eroded	1,750	.4
Memphis silt loam, 12 to 20 percent slopes	17,080	3.6
Memphis silt loam, 12 to 30 percent slopes, severely eroded	9,735	2.0
Memphis silt loam, 30 to 65 percent slopes	5,600	1.2
Robinsonville fine sandy loam	1,930	.4
Robinsonville silt loam	5,900	1.2
Sharkey clay	10,275	2.1
Swamp	1,870	.4
Tunica silty clay	12,720	2.6
Waverly silt loam	25,190	5.2
Gravel and sand pits	1,900	.4
Total	480,640	100.0

[1] Less than 0.05 percent.

penetrate readily. Some areas are flooded for short periods during winter and spring.

This soil is suited to all of the commonly grown crops and pasture plants. Most of the acreage is cultivated. Row crops can be grown every year. Good management of crop residue maintains the organic-matter content and keeps the soil in good tilth.

About the only wooded areas of this soil are on narrow bottom lands in the bluffs. The site is excellent for bottom-land oaks, sweetgum, cottonwood, and other bottom-land hardwoods. Plant competition is severe, and weeding is needed to promote reproduction of desirable species and to eliminate cull trees. All other limitations are slight.

This soil can produce abundant food and cover for wildlife. It is well suited to summer annual crops, such as grain sorghum, corn, and soybeans, and to some perennial crops, such as alfalfa. It can be row cropped every year. Crop wastes and the seeds of annual lespedeza and native plants furnish food for game birds. In the narrow draws in the bluffs, small areas planted to fescue, white clover, or alfalfa can benefit deer. Small wooded areas, ditchbanks that have grown up in brush, and odd-shaped areas between fields provide most of the cover now available. (Capability unit I–2)

Bonn Series

This series consists of poorly drained, silty soils on loess-covered terraces along the Wolf and Loosahatchie Rivers. These soils have appreciable amounts of exchangeable sodium in the subsoil (B horizon).

Representative profile of Bonn silt loam, 75 feet north of Walnut Grove Road and 1 mile west of Germantown Road, on the Shelby County Penal Farm:

Ap—0 to 5 inches, brown (10YR 5/3) silt loam; few, medium, light brownish-gray mottles; weak, fine, granular structure; friable; common fine roots; slightly acid; abrupt, smooth boundary.

A2g—5 to 10 inches, light brownish-gray (2.5Y 6/2) silt loam; few, medium, brown mottles; weak, fine, granular structure; friable; vesicular; many small holes; few small concretions; few fine roots; neutral; clear, wavy boundary.

B21tg—10 to 24 inches, light brownish-gray (2.5Y 6/2) silty clay loam; many, medium, yellowish-brown and grayish-brown mottles; weak, coarse, prismatic structure; firm when moist, hard when dry; few seams and streaks of dark grayish-brown clay; few tongues and pockets of gray silt; common, thick clay films; few roots; many fine pores; moderately alkaline; gradual, irregular boundary.

B22tg—24 to 36 inches, light brownish-gray (2.5Y 6/2) heavy silt loam; common, fine, light yellowish-brown, brown, and gray mottles; weak, coarse, prismatic structure; firm; few dark grayish-brown seams, streaks, and pockets of clay; some very thick clay films partially surround tongues and rounded pockets of gray silt; common fine pores; few small concretions; strongly alkaline; gradual, irregular boundary.

B3g—36 to 45 inches, light brownish-gray (2.5Y 6/2) silt loam; common, medium, light olive-brown and gray mottles; weak, coarse, prismatic structure that breaks to weak, medium, subangular blocky; firm; few pockets and thick films of clay; few fine pores; few, small, dark-brown concretions; few calcium carbonate concretions; strongly alkaline; gradual, wavy boundary.

Cg—45 to 72 inches, mottled light olive-brown (2.5Y 5/4) and light brownish-gray (2.5Y 6/2) silt loam; massive; friable; few, small, dark-brown concretions; strongly alkaline.

The thickness of the A horizon ranges from 5 to 18 inches. The reaction of the A horizon ranges from slightly acid to neutral, and that of the B horizon ranges from moderately alkaline to strongly alkaline. The texture of the B horizon

ranges from silt loam to silty clay loam, and the clay content decreases with depth.

Bonn silt loam (Bo).—This is a poorly drained, nearly level soil on second bottoms or benches. It occurs as tracts 2 to 20 acres in size. The surface layer commonly is 5 to 10 inches thick. It is brown over light brownish-gray, friable silt loam. The subsoil is light brownish-gray, mottled, firm silty clay loam to silt loam. It extends to a depth of 3 to 5 feet.

Surface runoff is slow; some areas are ponded in winter and spring. The subsoil is dense and poorly aerated. It restricts root growth and slows drainage. The shallow root zone causes droughtiness in summer, and slow drainage causes excessive wetness in winter and spring. The surface layer is slightly acid to neutral in reaction, and the subsoil is moderately alkaline to strongly alkaline. The subsoil contains appreciable amounts of exchangeable sodium. Alkali spots, also called slick spots or deer licks, are common. These spots range from a few square feet to 1 acre in size.

Most of the acreage has been cleared, and most of it is idle or in native pasture. The cultivated areas are parts of fields that consist mostly of other soils. Seasonal wetness and the sodium in the subsoil limit the choice of crops. The limitations can be overcome partly by open-ditch drainage and partly by selecting crops that tolerate sodium and that either grow in summer or tolerate wetness. Because of the slow internal movement of water, tile drains are not effective. Bermudagrass is fairly well suited, but most crops are poorly suited, even if surface drainage is adequate. Soybeans are very sensitive to the sodium and usually do not grow well. Diversions are needed to intercept runoff from higher soils.

The existing tracts of woodland are small. The trees are mainly willow oak, water oak, southern red oak, and sweetgum. The site is good for bottom-land oaks and sweetgum. Seedling mortality and plant competition are moderate in both planted stands and natural woodlands.

Wetness in winter and spring and the sodium content of the subsoil limit the choice of plants that furnish food and cover for wildlife. Most locally grown grasses are tolerant of sodium. (Capability unit IVw–1)

Bowdre Series

This series consists of moderately well drained or somewhat poorly drained, neutral or slightly acid soils on broad flats on the Mississippi River bottoms. The soils consist of 10 to 20 inches of dark silty clay over a coarser textured subsoil.

Representative profile of Bowdre silty clay on Island 40, 1½ miles south of Allen's Farm Shop:

Ap—0 to 7 inches, very dark grayish-brown (10YR 3/2) silty clay; moderate, fine and medium, granular structure; friable when moist, sticky and plastic when wet; mildly alkaline; clear, smooth boundary.

A1—7 to 14 inches, very dark grayish-brown (10YR 3/2) silty clay; moderate, medium, granular structure; firm when moist, sticky and plastic when wet; mildly alkaline; abrupt, smooth boundary.

IIC1—14 to 26 inches, dark grayish-brown (10YR 4/2) silt loam; few, fine, faint, light brownish-gray and yellowish-brown mottles; very dark grayish-brown silty clay in cracks and wormholes; weak, medium, subangular blocky structure to massive; friable; numerous worm casts; mildly alkaline; clear, smooth boundary.

IIC2—26 to 31 inches, dark grayish-brown (10YR 4/2) fine sandy loam; structureless; very friable; mildly alkaline; clear, smooth boundary.

IIC3—31 to 50 inches, dark grayish-brown (10YR 4/2) silt loam; common, fine, faint, dark-brown (7.5YR 3/2) mottles; structureless; very friable; mildly alkaline.

The dark, clayey surface layer ranges from 10 to 20 inches in thickness. It is underlain by silty clay loam, silt loam, loam, or fine sandy loam. Alternating layers of two or more of these textures commonly occur between a depth of 18 inches and a depth of 72 inches.

Bowdre silty clay (Bw).—This is a moderately well drained soil on the Mississippi River bottoms and on large islands. It occurs as broad, flat tracts 10 to 300 acres in size. It consists of 10 to 20 inches of nearly black silty clay underlain by slightly lighter colored, friable, silty or loamy layers.

Included in mapping was an area between Horn Lake and North Horn Lake that has a silty clay surface layer 5 to 10 inches thick. Also included were a few small spots of Robinsonville soils.

This Bowdre soil is flooded every 3 or 4 years in winter and spring. Some low areas are flooded every winter. When wet, the clayey surface layer is sticky and plastic and difficult to work. When moist, it is fairly easy to work. It swells when wet and shrinks when dry. Consequently, a network of cracks forms. The cracks are about 1 inch wide and extend down through the silty clay layer. They damage plant roots, although not seriously. Development of roots and movement of water and air are only slightly restricted.

Bowdre silty clay is a fertile soil. It is high in content of phosphorus and potassium. It does not need lime, since the reaction is slightly acid to mildly alkaline. Most crops show good response to nitrogen. The available water capacity is high.

This soil is suited to annual crops and crops that tolerate wetness in winter and spring. Among the crops that can be grown are soybeans, grain sorghum, white clover, tall fescue, and annual lespedeza. Cotton and alfalfa can be grown on the better drained sites at the higher elevations. Because of the clayey plow layer, the soil is only fairly well suited to corn.

Floods, standing water, and the sticky, clayey plow layer are the main limitations. Levees protect only a small acreage of this soil, but the water generally drains away in time for crops to be planted. Drainage ditches remove surface water satisfactorily during most of the growing season, but little can be done to prevent floods during winter and spring. Some farmers prefer to plow late in fall or early in spring, when the soil is moist or slightly wet. Freezing weather and rain break down the large clods, and, at planting time, a fairly good seedbed can be prepared by harrowing. Since erosion is not a problem, a row crop can be grown every year. The use of crop residue helps to maintain the organic-matter content and to improve tilth.

About half the acreage is woodland. A few woodland tracts are as much as 300 acres in size. The site is good to excellent for high-quality bottom-land hardwoods. Existing stands consist mainly of bottom-land oaks,

hackberry, sweetgum, sycamore, black willow, and cottonwood. Some cypress grows in the wetter spots. Because of excess water and the clayey texture, the rate of seedling mortality is moderate. Some areas are under water for as much as 2 or 3 weeks in winter and spring, and the standing water can be expected to kill some seedlings, especially seedlings of Nuttall oak. Plant competition is severe because of the high natural fertility. Weeds, vines, and briers grow abundantly in new plantings and in openings in existing stands. Plantings of cottonwood and sweetgum need to be cultivated during the first year in order to survive and grow. Because of flooding, a high water table, and the plastic nature of the soil, use of logging equipment is usually limited to the dry summer months.

This soil can produce an abundant growth of several plants that furnish food and cover for wildlife. Among these plants are soybeans, lespedeza, grain sorghum, and other summer annuals. Crop wastes add to the supply of food for wildlife. In the wooded areas, bottom-land hardwoods provide food and cover for squirrels, wild turkey, raccoon, and deer. In the lower areas floodwater and standing water attract waterfowl in winter. Wooded areas can be managed both as waterfowl habitat and for wood products; cleared areas can be seeded to Japanese millet, browntop millet, or other plants that provide food for ducks. (Capability unit IIw–1)

Calloway Series

This series consists of nearly level, somewhat poorly drained soils that formed in loess. These soils have a fragipan at a depth of about 15 to 25 inches.

Representative profile of Calloway silt loam, 50 feet west of the south intersection of Millington-Arlington and Deadfall Roads:

Ap—0 to 7 inches, brown (10YR 4/3) silt loam; weak, fine, granular structure; very friable; strongly acid; clear, smooth boundary.

B21—7 to 13 inches, yellowish-brown (10YR 5/4) silt loam; weak, medium, subangular blocky structure; friable; strongly acid; clear, smooth boundary.

B22—13 to 18 inches, pale-brown (10YR 6/3) silt loam; many, medium, yellowish-brown and light brownish-gray mottles; weak, medium, subangular blocky structure; friable; strongly acid; clear, smooth boundary.

A'2—18 to 21 inches, light brownish-gray (2.5Y 6/2) silt loam; common, medium, yellowish-brown mottles; weak, medium, subangular blocky and granular structure; very friable; brittle; many voids and vesicles; many brown concretions; strongly acid; clear, wavy boundary.

B'x1—21 to 30 inches, brown (10YR 5/3) silt loam; many, medium, yellowish-brown and light brownish-gray mottles; weak, medium, prismatic structure that breaks to weak, medium, subangular blocky; firm; compact and brittle; common thin clay films on both vertical and horizontal ped faces; gray silt coatings on some peds; gray silt in polygonal cracks; common pores and voids; common dark-brown concretions; strongly acid; gradual, smooth boundary.

B'x2—30 to 50 inches, dark-brown (7.5YR 4/4) silt loam; many, medium, light brownish-gray and yellowish-brown mottles; weak, coarse, prismatic structure that breaks to weak, coarse, subangular blocky; firm; compact and brittle; few patchy clay films on vertical faces; few small pores; strongly acid; gradual, smooth boundary.

B'3—50 to 60 inches, dark-brown (7.5YR 4/4) silt loam; common, medium, light brownish-gray mottles; weak, coarse, subangular blocky structure to massive; friable; some black stains on ped faces; few, dark-brown, soft concretions; strongly acid.

The solum is underlain by silty material that ranges from strongly acid to slightly acid. In places the lower part of the fragipan is mottled with shades of gray, brown, and yellow.

Calloway silt loam (Ca).—This is a somewhat poorly drained, nearly level, silty soil. It occurs as tracts 5 to 100 acres in size in the southeastern and north-central parts of the county. The surface layer is brown or dark grayish-brown silt loam. It is about 7 inches thick. The subsoil is friable, yellowish-brown silt loam mottled with shades of gray and brown. A fragipan that is 12 to 30 inches thick begins at a depth of about 2 feet. It consists of brown silt loam.

Included in mapping were a few small areas of gray, poorly drained soils and a few high knolls of moderately well drained soils.

The uppermost 20 inches of this soil is fairly well aerated and is readily penetrated by roots, water, and air, but the underlying fragipan restricts most roots and slows drainage. The grayish mottles in the subsoil are indications of wetness. Although wet and, in spots, ponded during winter and spring, this soil is somewhat droughty in summer because of the restricted root zone. It is easy to work after it dries out. The available water capacity is medium.

Calloway silt loam is strongly acid to medium acid in reaction. The natural fertility is low. The response to lime and fertilizer is good.

This soil is suited to soybeans, white clover, tall fescue, and other crops that tolerate wetness in winter and spring. It is also suited to lespedeza but is only fairly well suited to corn. Cotton grows well in some years, but the probability of a near failure is high because the soil is slow to dry out in spring. Small grains grow fairly well where water does not stand on the surface. Deep-rooted legumes, such as alfalfa, are poorly suited.

Wetness in winter and spring is the main limitation. This limitation can be overcome partly by selecting crops that tolerate wetness and partly by using drainage ditches to remove surface water from pockets and low areas. Because of slow internal movement of water, tile drainage is not very effective. Growing a crop every year will not damage this soil, since it is nearly level and is not likely to erode, but large amounts of fertilizer will be needed and crop residue should be managed so as to maintain the organic-matter content and help preserve good tilth.

Very little of the acreage is woodland. The site is good for bottom-land oaks and sweetgum. Seedling mortality and plant competition are moderate in both planted stands and natural woodland. In winter and spring, when this soil is wet, the use of heavy logging equipment may injure tree roots and compact the soil.

This soil is suitable for growing many annual and perennial plants that furnish food and cover for wildlife. It is best suited to summer annual crops and crops that tolerate wetness in winter and spring. Wastes left when crops such as soybeans are harvested furnish some food for wildlife. Weeds, annual lespedeza, and native plants that grow along field borders provide food and cover.

Scattered wooded areas also provide food and cover. Autumn olive, sericea lespedeza, shrub lespedeza, and pyracantha are among the perennials that can be planted.

This soil is suited to most lawn grasses and ornamental plants commonly grown in this region. Ornamental plants that either have shallow root systems or can tolerate wetness in the subsoil during winter and spring should be selected. (Capability unit IIIw–2)

Collins Series

This series consists of deep, level, moderately well drained, silty soils on first bottoms. These soils formed in strongly acid sediment recently washed from nearby loess hills.

Representative profile of Collins silt loam, 25 feet east of Germantown Road, 300 yards north of Interstate Highway 40:

Ap—0 to 8 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure; very friable; strongly acid; clear, smooth boundary.

C1—8 to 18 inches, brown (10YR 5/3) silt loam; few, fine, faint, pale-brown mottles; very friable; thin bedding planes; strongly acid; clear, smooth boundary.

C2—18 to 30 inches, brown (10YR 5/3) silt loam; common, medium, light brownish-gray and pale-brown mottles; very friable; thin bedding planes; strongly acid; clear, smooth boundary.

C3—30 to 50 inches, dark grayish-brown (10YR 4/2) silt loam; common, medium, faint, light brownish-gray mottles; friable; strongly acid.

The depth to the layer having grayish mottles ranges from 15 to 20 inches. The texture throughout the profile ranges from silt loam to silt.

Collins silt loam (Co).—This is a deep, moderately well drained soil on first bottoms. It has a silt loam texture to a depth of 3 feet or more. Gray mottles below a depth of about 18 inches are indications of wetness.

Included in mapping were a few small sandy spots and a few spots mottled with gray within 12 inches of the surface.

Crops show excellent response to lime and fertilizer. The available water capacity is high. Roots penetrate readily to a depth of 3 feet or more. The water table is about 24 inches below the surface during parts of winter and spring. Some areas are flooded for short periods in winter and spring.

This soil is used mainly for cultivated crops and pasture. If adequately limed and fertilized and otherwise well managed, it is well suited to all the commonly grown crops. It can be under continuous cultivation. Plowing under stalks and stubble helps to maintain the organic-matter content. Diversions are needed in some places to prevent deposition of sediment or overwash from adjoining upland slopes.

Very little of the acreage is woodland. The site is excellent for bottom-land hardwoods. Plant competition is severe, because of the high available water capacity and high fertility. Both natural stands and planted stands need to be weeded.

This soil can produce abundant food and cover for bobwhite quail, doves, and rabbits. Wastes left when corn and soybeans are harvested add to the food supply. Small wooded areas, ditchbanks that have grown up in brush, and odd-shaped areas in the corners of fields provide most of the cover now available. Fields managed specifically for doves can be planted to browntop millet, which matures quickly and so can be planted after a small-grain crop has been harvested. Ditchbanks, fence corners, and odd-shaped areas between fields can be used to provide food and cover for quail. Autumn olive, sericea lespedeza, shrub lespedeza, and pyracantha are among the food and cover plants that can be grown in field borders. (Capability unit I–2)

Commerce Series

This series consists of neutral or mildly alkaline, somewhat poorly drained soils on the Mississippi River bottoms. These soils formed in loamy sediment.

Representative profile of Commerce silt loam, half a mile east of the Memphis Steam Plant, in Ensley Bottom:

Ap—0 to 6 inches, very dark grayish-brown (10YR 3/2) to dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable; mildly alkaline; clear, smooth boundary.

B21—6 to 17 inches, dark grayish-brown (10YR 4/2) silt loam; few, fine, faint, gray and brown mottles; weak, fine, granular structure; friable; mildly alkaline; clear, smooth boundary.

B22—17 to 25 inches, dark grayish-brown (10YR 4/2) silty clay loam; common, fine, gray, dark-brown, and dark yellowish-brown mottles; weak, medium, subangular blocky structure to massive; firm; mildly alkaline; clear, smooth boundary.

C1g—25 to 34 inches, dark-gray (10YR 4/1) silt loam; common, medium, dark grayish-brown and dark-brown mottles; massive; firm; mildly alkaline; clear, smooth boundary.

C2g—34 to 48 inches, dark-gray (10YR 4/1) silty clay loam; common, medium, dark grayish-brown and dark-brown mottles; massive; mildly alkaline.

The texture of the soil at a depth of 10 to 40 inches is variable because of stratification, but the dominant textures are silt loam and silty clay loam.

Commerce silt loam (Cr).—This is a somewhat poorly drained, nearly level soil on the Mississippi River bottoms. It occurs as scattered tracts 10 to 100 acres in size. The uppermost 6 inches is very dark grayish-brown silt loam. This material is underlain by gray and brown silt loam or silty clay loam that is mottled with shades of gray and brown and extends to a depth of several feet.

Included in mapping were small areas that have a surface layer of silty clay loam, some that have stratified layers of sand and clay below a depth of 30 inches, and a few that are free of mottles to a depth of 20 inches.

Every 4 or 5 years, this soil is flooded in winter and spring for a period of 1 or 2 weeks. The water table is about 2 feet below the surface in winter and spring. Tillage is easy after the excess water drains away. The available water capacity is high.

This soil is neutral in reaction and high in content of phosphorus and potassium. Most crops show good response to nitrogen.

Most of the acreage has been cleared. Cotton, soybeans, and annual lespedeza are suitable crops. Corn grows well, but it may have to be planted later than on better drained soils. Small grain can be grown if surface drainage is

good and if flooding is not severe. Row crops can be grown every year.

Wetness is the main limitation. This limitation can be overcome partly by drainage and partly by selecting crops that are least likely to be damaged by wetness. Tile drains are effective if outlets are available.

The site is excellent for bottom-land oaks, sweetgum, cottonwood, and other bottom-land hardwoods. Because of the high fertility and high available water capacity, plant competition is severe. Weeding is needed in natural stands to promote reproduction of desirable species and to eliminate cull trees. It is needed in planted stands to insure survival of seedlings. Floods occasionally stop logging operations for short periods in winter and spring.

The bottom-land oaks, hickory, hackberry, and other bottom-land hardwoods that grow on this soil provide food and cover for squirrels, wild turkey, deer, and other wildlife. Summer annual crops are well suited. Much of the acreage is used to grow cotton and soybeans. Wastes left when soybeans are harvested add to the food supply. Fields managed specifically for doves can be planted to browntop millet, which matures quickly and so can be planted after a small-grain crop has been harvested. Most of the cover now available is in wooded areas and in odd-shaped areas in the corners of fields. (Capability unit I–2)

Convent Series

This series consists of level, somewhat poorly drained, neutral, silty soils on first bottoms. These soils formed in sediment washed from the steep loess hills.

Representative profile of Convent silt loam, a fourth of a mile west of the bluffs and a fourth of a mile south of the Tipton County line:

Ap—0 to 7 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; very friable; neutral; clear, smooth boundary.
C1—7 to 15 inches, dark grayish-brown (10YR 4/2) silt loam; common, fine, dark-brown mottles; structureless; mildly alkaline; clear, smooth boundary.
C2g—15 to 26 inches, grayish-brown (10YR 5/2) silt loam; many, medium, dark-brown mottles; structureless; mildly alkaline; clear, smooth boundary.
C3g—26 to 45 inches, gray (10YR 5/1) silt loam; common, medium, grayish-brown and brown mottles; structureless; mildly alkaline.

The color of the Ap horizon ranges from dark grayish brown to brown. The texture throughout the profile is silt loam or silt.

Convent silt loam (Cs).—This is a somewhat poorly drained soil at the foot of loess-covered bluffs and along small streams that drain through the bluffs. The plow layer is dark grayish-brown silt loam, and the underlying material is silt loam that is mottled with shades of gray and brown and becomes predominantly gray at an average depth of 2 feet. Grayish colors below a depth of about 12 inches are indications of wetness.

Included in mapping were a few small areas that have mottles within 10 inches of the surface, some spots that are free of mottles to a depth of 18 to 20 inches, and a few small sandy spots.

This soil is seldom flooded. During much of the winter and spring, the water table is within a foot or two of the surface. It is the cause of mottles in the subsoil. In summer and fall, the water table is several feet below the surface. After the soil dries out in spring, it is easy to work. The available water capacity is high. This soil is neutral in reaction and does not need lime. It is high in content of phosphorus and potassium.

Approximately half the acreage has been cleared and is cultivated or in pasture. Soybeans, corn, tall fescue, white clover, bermudagrass, and lespedeza are suitable crops. Cotton grows well in some years, but the probability of failure is high because the soil is slow to dry out in spring. Small grains can be grown if surface drainage is good and if flooding is not severe. This soil is well suited to supplemental summer pasture, since moisture is adequate for plant growth even during the dry part of the summer. In winter and early in spring, the soil is too wet and too soft to be used for grazing.

Wetness is the main limitation. This limitation can be overcome partly by drainage and partly by selecting crops that tolerate wetness. Erosion is no problem. Row crops can be grown every year.

About half the acreage is woodland. The site is excellent for bottom-land oaks, sweetgum, cottonwood, and other bottom-land hardwoods. Plant competition is severe, and weeding and cultivation may be needed in newly planted stands. In existing stands, weeding is needed to promote reproduction of desirable species and to eliminate cull trees. During much of winter and spring, the soil is too wet for logging to be possible.

This soil can produce abundant food and cover for wildlife. Field corners, fence rows, and ditchbanks are excellent sites for this use. Crop wastes and such native plants as deciduous holly, haw, and lespedeza, which grow along the borders of fields and in odd-shaped areas between fields, furnish food. Sericea lespedeza, shrub lespedeza, autumn olive, and pyracantha are among the perennials that can be grown to furnish food and cover. (Capability unit IIw–1)

Crevasse Series

This series consists of excessively drained, sandy soils that occur as long, narrow strips along the Mississippi River. The texture is sand or loamy sand to a depth of 40 inches or more, except that the plow layer may be finer textured. The slope range is 0 to about 3 percent.

Representative profile of Crevasse fine sand, half a mile west of the riding stable on Presidents Island:

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) fine sand; loose; neutral; clear, smooth boundary.
C—8 to 60 inches, pale-brown (10YR 6/3) fine sand; loose; neutral.

The thickness of the sandy layers is more than 40 inches and is generally more than 48 to 96 inches. The reaction is slightly acid to neutral.

Crevasse fine sand (Cu).—This soil occurs along the Mississippi River, as tracts 40 to 100 acres in size. It has the profile described as typical for the series. Most areas have a hummocky surface. Included in mapping were a few areas of loamy sand.

Crevasse fine sand has a very low available water capacity and, consequently, is extremely droughty. It is slightly

acid to neutral in reaction. It is flooded every few years.

Only a small acreage has been cleared. Most of the cleared area is idle or in bermudagrass pasture. Droughtiness limits the choice of crops to small grain, pasture, and other crops that grow in winter and spring, when moisture is most plentiful.

About three-fourths of the acreage is woodland. The trees are mainly cottonwood, black willow, and hackberry. In places the stand is thin, although the site is moderately good for cottonwood and black willow. Because of droughtiness, the loss of a fourth to a half of the seedlings in both planted and natural stands is to be expected.

The droughty nature of this soil limits the choice of plants that can be grown to provide food for wildlife. Plants that grow in winter and spring when available moisture is most plentiful are suitable. Winter small grains grow well if flooding is not severe. Sunflowers and sorghum also grow well. (Capability unit IVs–1)

Crevasse silt loam (Cv).—This is an excessively drained soil that occurs along the Mississippi River, as tracts 10 to 80 acres in size. The surface layer is silt loam or loam 6 to 10 inches thick. The substratum is almost pure sand. It extends to a depth of 4 feet or more. The slope range is 0 to 3 percent. Most areas have an uneven surface.

Included in mapping were a few areas that have a slightly finer textured substratum.

Crevasse silt loam has a low available water capacity and is extremely droughty. It is slightly acid to neutral in reaction and does not need lime. It is flooded every 5 to 10 years.

This soil is suited to small grain, pasture, and other crops that grow in winter and spring when moisture is most plentiful. It is fairly well suited to deep-rooted crops, such as alfalfa, but is too droughty for cotton and soybeans.

Droughtiness is the main limitation. This limitation can be partly overcome by selecting plants that grow when moisture is most plentiful. Flooding is a minor limitation.

Very little of the acreage is woodland. The site is moderately good for cottonwood and black willow. Because of droughtiness, the loss of about a fourth of the seedlings in both planted and natural stands is to be expected.

The droughty nature of this soil limits the choice of plants that can be grown for wildlife. Plants that have deep root systems or plants that grow in winter and spring are best suited. Small grains, sorghum, and sunflowers can be grown to provide food for wildlife. (Capability unit IVs–1)

Falaya Series

This series consists of somewhat poorly drained, strongly acid, nearly level, silty soils on bottom lands.

Representative profile of Falaya silt loam, 100 feet north of Raines Road, three-fourths of a mile east of Outland Road:

Ap—0 to 6 inches, brown (10YR 4/3) silt loam; weak, fine, granular structure; very friable; strongly acid; clear, smooth boundary.

C1—6 to 18 inches, brown (10YR 5/3) silt loam; common, medium, light brownish-gray and pale-brown mottles; structureless; friable; strongly acid; clear, smooth boundary.

C2g—18 to 38 inches, light brownish-gray (10YR 6/2) silt loam; common, medium, gray and brown mottles; massive; friable; many, small, hard concretions; strongly acid; gradual, smooth boundary.

C3g—38 to 60 inches, dark-gray (10YR 4/1) silt loam; common, medium, light brownish-gray, yellowish-brown, and gray mottles; massive; friable; many, small, brown, hard concretions; strongly acid.

The color of the surface layer ranges from brown to dark grayish brown. The C horizon has a high content of silt. The content of sand is no more than 15 percent and is commonly less than 10 percent.

Falaya silt loam (Fm).—This is a somewhat poorly drained, very silty, nearly level soil on first bottoms. It occurs throughout the county, except on the Mississippi River bottoms. The surface layer is brown, friable silt loam about 6 inches thick. The underlying material is friable silt loam that contains brown and gray mottles. It extends to a depth of several feet.

Included in mapping were some areas, in the vicinity of Woodstock and Millington, that are underlain with very dark gray to black silt loam or silty clay loam at a depth of 18 to 30 inches. Also included were small sandy spots in the eastern part of the county.

In winter and early in spring, the water table is often within a foot of the surface. In summer and fall it is several feet below the surface. Floods cover most areas during winter and spring, but the floodwater seldom stands more than a few hours.

This soil is easy to work after it dries out in spring. The lowest areas, however, are wet fairly late in spring (fig. 7). The available water capacity is high. The reaction is medium acid or strongly acid, and the content of phosphorus and potassium is moderately high. Crops respond to lime and fertilizer.

If adequately limed and fertilized and otherwise well managed, this soil is well suited to nearly all the commonly grown crops. Small grains can be grown if surface drainage is good and if flooding is not severe. Because of wetness, stands of alfalfa are not long lived. Tall fescue, annual lespedeza, and bermudagrass are suitable pasture plants. The surface is too wet and too soft for grazing during much of winter and early in spring. Nearly all of the acreage is used to grow cotton, corn, soybeans (fig. 8), pasture plants, and truck crops. Plowing under crop residue helps to maintain the organic-matter content.

Excess water is the main limitation. This limitation can be largely overcome by using a system of drainage ditches or tile and by selecting plants that tolerate wetness in winter and spring.

Some of the acreage is woodland. The site is excellent for bottom-land oaks, sweetgum, cottonwood, and other bottom-land hardwoods. Plant competition is severe. Weeding is needed in existing stands to promote reproduction of desirable species and to eliminate cull trees. Weeding is needed in planted stands to insure survival of seedlings.

This soil is well suited to many summer annuals that furnish food and cover for bobwhite quail, doves, and rabbits. Wastes left when corn and soybeans are har-

Figure 7.—**Shaping an area of Falaya silt loam, to eliminate spots where water collects. The equipment is a land plane.**

vested furnish a considerable amount of food for game. The seeds of weeds, annual lespedeza, and native plants that grow along field borders and ditches provide additional food. Scattered areas of trees and bushes along ditchbanks and field borders provide some cover. Low areas that are 3 acres or more in size can be developed as feeding places for waterfowl by establishing food-producing plants and then flooding. The water must be removed in spring so the crops can be planted in summer. (Capability unit IIw–1)

Filled land, silty (Fs).—This land type consists of soil material that has been moved for the purpose of leveling and building up sites for industrial, commercial, or residential development. The areas are 5 to 40 acres in size. Most are near or on the outer edges of Memphis. Included in mapping were some gravel pits that have been filled in and are suitable for farming.

A few areas have been filled with trash, tree trunks and roots, overlapping slabs of concrete, and other types of filling material that could cause settling of buildings and could also cause difficulty in sinking pilings. Areas that are adjacent to Graded land, silty materials, generally consist of clean, silty fill.

If a good seedbed is prepared and if enough fertilizer and water are used, this land type is well suited to lawn grasses and ornamental plants. Some areas are suitable for development as recreational sites, such as tennis courts, golf courses, and parks. (Not in a capability unit)

Filled land, sandy (Fy).—This land type consists of sand that was dredged from the Mississippi River. Most areas were made for industrial sites. The largest single tract is the industrial site on Presidents Island, which has been built up to an elevation of 10 feet above the highest locally recorded flood.

This land type is low in natural fertility. The available water capacity is very low. Frequent applications of fertilizer and water are needed to establish and maintain lawns and shrubbery around buildings. (Not in a capability unit)

Grenada Series

This series consists of moderately well drained, silty soils that have a fragipan. These soils formed in loess more than 4 feet thick. The slope range is 0 to 12 percent.

Representative profile of Grenada silt loam, 2 to 5 percent slopes, eroded, 200 yards west of Bobo Road and 400 yards south of Smith Road:

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

B21—6 to 13 inches, yellowish-brown (10YR 5/4) silt loam; weak, medium, subangular blocky structure; friable; strongly acid; clear, smooth boundary.

B22—13 to 22 inches, yellowish-brown (10YR 5/4) silt loam; few, medium, pale-brown and brown mottles; weak, medium, subangular blocky structure; friable; few,

Figure 8.—**Harvesting soybeans on Falaya silt loam. Plowing under crop residue helps to maintain the organic-matter content.**

soft, dark-brown concretions; strongly acid; clear, wavy boundary.

A'2x—22 to 26 inches, light brownish-gray (10YR 6/2) silt loam; many, fine, yellowish-brown and brown mottles; weak, medium and fine, subangular blocky structure; friable; slightly brittle; many, fine, vesicular pores; few, soft, brown concretions; very strongly acid; abrupt, wavy boundary.

B'x—26 to 40 inches, yellowish-brown (10YR 5/4) silt loam; many, medium, light brownish-gray and dark yellowish-brown mottles; weak, coarse, prismatic structure that breaks to moderate, medium, subangular blocky; firm; brittle; thick patchy clay films; few gray silt streaks and seams; few vesicular pores; very strongly acid; gradual, wavy boundary.

B3—40 to 60 inches, yellowish-brown (10YR 5/4) silt loam; common, medium, pale-brown and dark-brown mottles; weak, medium, subangular blocky structure; friable; few brown concretions; strongly acid.

The texture of the B horizon above the fragipan is silty clay loam in places. The depth to the fragipan ranges from about 15 to 30 inches.

Grenada silt loam, 0 to 2 percent slopes (GaA).—This is a moderately well drained soil on broad ridgetops. The surface layer is brown, very friable silt loam 6 to 12 inches thick. The upper part of the subsoil is yellowish-brown, friable silt loam. This extends to a depth of about 2 feet. Below this is a compact, brittle fragipan 1 to 3 feet thick. The fragipan is mottled with shades of gray and brown. Underlying the fragipan is brown, friable silt loam that extends to a depth of several feet.

Runoff is slow, and in places the soil dries out slowly in spring. Roots, water, and air readily penetrate the uppermost 24 inches, but the fragipan restricts root growth and slows drainage. The reaction is strongly acid, and the natural fertility is moderate. The response to the use of fertilizer and other good management practices is good. The available water capacity is medium.

Most of the acreage has been cleared. Tilth is generally good, and the hazard of erosion is only slight. Consequently, this soil can be used intensively for crops and pasture. If adequately fertilized and otherwise well managed, it is suited to cotton, soybeans, and small grains. Because of seasonal wetness in the lower part of the subsoil and slow runoff in spots, alfalfa stands generally do not survive more than 2 years. Tall fescue, white clover, annual lespedeza, and bermudagrass grow well.

Small woodlots are the only remaining forested areas. Existing stands consist of many kinds of upland hardwoods. The site is good for hardwoods, loblolly pine, and shortleaf pine. Pine is not native, but plantings up to 25 years of age show that it is well suited. There are no major problems in forestry management.

This soil is suited to many kinds of annual and perennial plants that provide food and cover for wildlife. Wastes left when such crops as soybeans and corn are

harvested furnish some food for wildlife. Annual lespedeza and tall fescue also provide some food. Weeds and other native plants that grow along field borders provide additional food and cover. The small wooded areas furnish food and cover for squirrels. Autumn olive, shrub lespedeza, and sericea lespedeza are among the plants suitable for use in field borders.

This soil is suited to lawn grasses and ornamental plants, especially those that tolerate excess wetness in the subsoil in winter and spring. Plantings of pyracantha, autumn olive, dogwood, and holly in urban areas and around homes attract many kinds of birds. (Capability unit IIw–2)

Grenada silt loam, 2 to 5 percent slopes (GaB).—This is a moderately well drained soil on uplands in the eastern half of the county. It occurs as scattered tracts 5 to 100 acres in size. The surface layer is commonly 5 or 6 inches thick. It is brown to dark grayish-brown silt loam. The upper part of the subsoil is yellowish-brown, friable silt loam. A fragipan begins about 24 inches below the surface. It is dense, brittle, yellowish-brown silt loam mottled with shades of gray and brown. Included in mapping were small wooded areas that have a dark-brown surface layer.

Roots, water, and air readily penetrate the uppermost 26 inches of this soil, but the fragipan restricts root growth and slows drainage. At times the fragipan causes wetness in the upper part of the soil, and, consequently, runoff is rapid during rainy seasons. Because of the fairly shallow root zone and rapid runoff, this soil is somewhat droughty in summer. The available water capacity is medium. The reaction is strongly acid, and the natural fertility is moderately low. The response to lime and fertilizer is good.

Most of the acreage has been cleared. If adequately fertilized and otherwise well managed, this soil is well suited to cotton, soybeans, small grain, tall fescue, white clover, lespedeza, orchardgrass, and bermudagrass. Growth of corn varies considerably from year to year, depending on summer rainfall. Because of the limited root zone and seasonal wetness in the lower part of the subsoil, alfalfa stands generally do not last more than 2 years.

Seasonal wetness and a slight hazard of erosion are the main limitations. The limitation of seasonal wetness can be overcome partly by selecting plants that tolerate wetness in winter and spring and do not require a great deal of water in summer. Runoff can be reduced and erosion controlled by means of suitable cropping systems, adequate amounts of fertilizer, and water-control practices. If such conservation measures as terraces, grassed waterways, and contour farming are applied, row crops can be grown about 1 out of 2 years. An example of a suitable cropping system is 2 years of cotton or soybeans and 2 years of grass and legumes. Turning under stalks and stubble helps to maintain the organic-matter content. Stripcropping helps to control runoff and erosion.

Small woodlots are the only remaining forested areas. Existing stands consist of many kinds of upland hardwoods. The site is good for hardwoods, loblolly pine, and shortleaf pine. Pine is not native to this soil, but plantings up to 25 years of age show that it is well suited. Problems of forestry management are slight.

This soil is suitable for many plants that provide food and cover for wildlife. It is suited to annual lespedeza, sericea lespedeza, soybeans, corn, grain sorghum, and small grain. Crop wastes and the seeds of lespedeza and native plants that grow along field borders furnish additional food. The small, scattered, wooded areas furnish food and cover for wildlife, especially squirrels. Bobwhite quail, doves, and rabbits are the most common game. Fields managed specifically for doves can be planted to a summer annual, such as browntop millet, which matures quickly and so can be planted after a small-grain crop has been harvested. Shrub lespedeza, autumn olive, and pyracantha are among the perennials suitable for use in field border plantings.

This soil is suited to lawn grasses and to ornamental plants, especially those that tolerate wetness in the subsoil. Such plants generally have shallow root systems. Because of the restricted root zone, they may need additional water during prolonged hot and dry periods. Fruit-bearing or berry-bearing ornamental plants, such as pyracantha, dogwood, and some kinds of holly, can be planted in urban areas to attract songbirds. (Capability unit IIe–2)

Grenada silt loam, 2 to 5 percent slopes, eroded (GaB2).—This is a moderately well drained soil on uplands in the eastern half of the county. It occurs as tracts 5 to 100 acres in size. It has the profile described as typical for the series. The plow layer is brown or yellowish-brown silt loam. The subsoil is yellowish-brown, friable silt loam. A fragipan consisting of silt loam mottled with gray and brown commonly begins at a depth of 15 to 24 inches but most commonly at about 20 inches. Included in mapping were a few small areas where the fragipan is immediately below the plow layer.

The fragipan restricts root growth and causes water to drain slowly through the subsoil. At times it causes wetness in the upper part of the soil. Consequently, runoff is rapid during rainy seasons. The restricted root zone and rapid runoff cause this soil to be somewhat droughty in summer. The available water capacity is medium. The reaction is strongly acid and the natural fertility is moderately low. The response to lime and fertilizer is good or moderate.

This soil is well suited to tall fescue, white clover, annual lespedeza, sericea lespedeza, and bermudagrass. It is fairly well suited to cotton and soybeans, but it is poorly suited to corn and alfalfa.

Control of runoff and erosion are the main problems. Terracing, grassed waterways, stripcropping, contour farming, a suitable cropping system, and proper fertilization are effective measures. An example of a suitable cropping system is 1 year of a row crop, planted on the contour, and 2 years of grass and legumes for pasture or hay.

The site is good for many kinds of upland hardwoods, loblolly pine, and shortleaf pine. Pine is not native, but plantings up to 25 years of age show that it is well suited. Limitations for growing trees are slight or few.

This soil is suited to many plants that furnish food and cover for quail, doves, and rabbits. Annual lespedeza, sericea lespedeza, soybeans, grain sorghum, small grain,

tall fescue, and white clover grow well. Crop wastes furnish food, and so do the seeds of weeds, of lespedeza, and of native plants that grow along field borders and fence rows. The scattered, small, wooded areas and odd-shaped, idle areas in field corners provide cover. Fields managed specifically for doves can be planted to a summer annual, such as browntop millet, which matures quickly and so can be planted after a small-grain crop has been harvested. Annual and perennial plants that furnish food can be used in field borders and fence rows.

This soil is well suited to lawn grasses and most of the ornamental plants commonly grown in this region. Because of the fragipan and the restricted root zone, additional water may be needed during prolonged hot and dry periods. The fruits and berries of some of the ornamental plants, such as autumn olive, dogwood, pyracantha, and some kinds of holly, provide food for birds. (Capability unit IIIe–2)

Grenada silt loam, 5 to 8 percent slopes (GaC).—This is a moderately well drained soil on short side slopes. It occurs as tracts 3 to 20 acres in size. The surface layer is brown, friable silt loam. It is commonly about 8 inches thick. The uppermost 2 or 3 inches contains dark-brown stains caused by decayed leaves and twigs. The upper part of the subsoil is yellowish-brown, friable silt loam about 15 inches thick. A fragipan consisting of mottled brown and gray, compact silt loam begins about 2 feet below the surface. It is 1 to 3 feet thick. Below the fragipan is brown or yellowish-brown, friable silt loam that extends to a depth of several feet.

Roots, water, and air readily penetrate the surface layer and the upper part of the subsoil, but they are restricted by the fragipan. The restricted movement of water causes rapid runoff. Because of the limited root zone and rapid runoff, this soil is somewhat droughty during summer and fall. The available water capacity is medium. The reaction is strongly acid, and the natural fertility is moderately low. Crops show good response to the use of lime and fertilizer and to other good management practices.

Cleared areas are few and small. Because of their size, irregular shape, and location, these areas would be rather difficult to farm as separate fields. If cleared, this soil is suited to the commonly grown crops, but it erodes rapidly unless protected. Effective measures include contour farming, terraces, grassed waterways, and stripcropping. A suitable cropping system is 1 year of a row crop, planted on the contour, then 2 years of grass and legumes for hay or pasture. Tall fescue, white clover, annual lespedeza, and bermudagrass are suitable for pasture or hay.

Most of the acreage consists of small woodlots. Existing stands include many kinds of upland hardwoods. The site is good for upland hardwoods, loblolly pine, and shortleaf pine. Pine is not native, but plantings up to 25 years of age show that it is well suited. This soil has no significant limitations for growing trees.

This soil is fairly well suited to many plants that furnish food and cover for wildlife. Upland oaks, hickory, hackberry, and dogwood provide some food and cover for squirrels, rabbits, deer, and quail. They also provide resting places for doves.

This soil is fairly well suited to lawn grasses and ornamental plants commonly grown in this region. Because of rapid runoff, the fragipan, and the restricted root zone, additional water may be needed during prolonged hot and dry periods. Autumn olive, dogwood, pyracantha, and some kinds of holly add to the beauty of parks and other urban areas and, in addition, attract nongame birds. (Capability unit IIIe–2)

Grenada silt loam, 5 to 8 percent slopes, severely eroded (GaC3).—This is a moderately well drained soil on uplands in the eastern part of the county. It occurs as scattered tracts 5 to 40 acres in size. The plow layer is brown to yellowish-brown, friable silt loam. The upper part of the subsoil is yellowish-brown silt loam. A fragipan begins at a depth of 14 to 20 inches. It is mottled gray and brown, compact silt loam and is 1 to 3 feet thick. Some small spots are so severely eroded that nearly all of the material above the fragipan has been washed away. Below the fragipan is yellowish-brown, friable silt loam that extends to a depth of several feet.

The fragipan restricts most roots to the uppermost 14 to 20 inches and slows drainage. The slow movement of water causes the upper part of the subsoil to be waterlogged at times. Surface runoff is rapid during rainy seasons. Because of the fairly shallow root zone and rapid runoff, this soil is somewhat droughty in summer. It is strongly acid in reaction and low in natural fertility. The available water capacity is medium. The response to lime and fertilizer is moderate. The soil is friable and easy to work.

Most of the acreage has been cleared. Row crops, hay, and pasture can be grown. This soil is suited to only occasional cultivation. It is fairly well suited to cotton and soybeans but is poorly suited to corn and alfalfa. Most hay and pasture crops, such as tall fescue, white clover, annual lespedeza, and bermudagrass, show good response to lime and fertilizer.

Severe erosion has reduced the thickness of the zone for root growth and water storage. Consequently, runoff is greater and control of erosion is more difficult. Erosion can be controlled by means of suitable cropping systems, proper fertilization, and water-control measures that include terracing, grassed waterways, stripcropping, and contour farming. An example of a suitable cropping system is 1 year of a row crop and 4 years of grass and legumes for hay and pasture.

Small woodlots are about the only forested areas. Existing stands consist of upland hardwoods. The site is good for upland hardwoods, loblolly pine, and shortleaf pine. Pine is not native, but plantings up to 25 years of age show that it is well suited. The erosion hazard is severe, so protection is needed if roads and trails are built. Disturbance of the soil should be avoided as much as possible.

This soil is fairly well suited to some of the commonly grown crops that furnish food for wildlife, but it is not suitable for annual cultivation. Because of the restricted root zone, it is only fairly well suited to shrubs, such as autumn olive and shrub lespedeza.

Most lawn grasses commonly grown in this region are fairly well suited. Some need extra care until they become established. Ornamental plants that have either shallow root systems or roots that can penetrate the fragipan should be selected. Because of the restricted root zone, additional water may be needed during prolonged hot and dry periods. Lawn grasses and orna-

mental plants show good response to fertilizer. (Capability unit IVe–2)

Grenada silt loam, 8 to 12 percent slopes (GaD).—This is a moderately well drained soil on hillsides in the eastern half of the county. It occurs as tracts 5 to 40 acres in size. The surface layer is brown, friable silt loam 7 to 9 inches thick. The uppermost 2 or 3 inches contains dark-brown stains caused by decayed leaves and twigs. The subsoil is yellowish-brown silt loam. At a depth of 22 to 30 inches is a fragipan consisting of mottled grayish-brown and brown, compact silt loam. It is about 1 to 3 feet thick. Below the fragipan is brown, friable silt loam.

Roots, water, and air readily penetrate the layers above the fragipan but are restricted by the fragipan. Because of the slow movement of water, the upper part of the soil is waterlogged at times, and runoff is rapid during rainy seasons. The restricted root zone and rapid runoff cause the soil to be somewhat droughty in summer. The available water capacity is medium. The reaction is strongly acid, and the content of phosphorus and potassium is low.

This soil is well suited to hay and pasture crops, but it is marginal for row crops because it erodes easily. It should be used for row crops only 1 year out of 4, and it should be farmed in contour strips. Slope is the main limitation for row crops. Hay and pasture plants that grow well include tall fescue, white clover, annual lespedeza, and sericea lespedeza. Because of their small size, irregular shape, and location, some areas would be rather difficult to farm as separate fields. Only a few small areas have been cleared.

Most of the acreage is woodland. Existing stands consist of many kinds of upland hardwoods. The site is good for upland hardwoods, loblolly pine, and shortleaf pine. Pine is not native, but plantings up to 25 years of age show that it is well suited. The hazard of erosion is moderate, so protection is needed if roads and trails are built. Disturbance of the soil should be avoided as much as possible.

This soil is fairly well suited to upland oaks, hickory, hackberry, and dogwood, all of which provide some food and cover for wildlife. Sericea lespedeza and shrub lespedeza can be planted along the edge of woods to supply additional food.

This soil is fairly well suited to lawn grasses commonly grown in this region and to ornamental plants that have a fairly shallow root system. Because of the slope and rapid runoff, some extra care is needed to control erosion until a lawn becomes established. Because of the restricted root zone and rapid runoff, additional water may be needed during prolonged hot and dry periods. Grasses and ornamentals show good response to fertilizer. (Capability unit IVe–2)

Grenada silt loam, 8 to 12 percent slopes, eroded (GaD2).—This is a moderately well drained soil on hillsides. The plow layer is yellowish-brown, friable silt loam about 6 inches thick. It consists partly of original subsoil material. The subsoil is yellowish-brown, friable silt loam to a depth of 12 to 18 inches. A fragipan consisting of mottled grayish-brown and brown, compact silt loam begins 12 to 18 inches below the surface. It is 1 to 3 feet thick. Below the fragipan is yellowish-brown or brown silt loam that extends to a depth of several feet.

The color of the plow layer ranges from brown to yellowish brown. The fragipan is immediately below the plow layer in spots, and in a few small gullies it is exposed.

Roots, water, and air readily penetrate the uppermost 12 to 18 inches of this soil. The fragipan restricts the growth of roots and slows the movement of water and air. The slow movement of water causes the upper part of the soil to be waterlogged at times, and runoff is rapid during rainy seasons. Because of the restricted root zone and rapid runoff, the soil is somewhat droughty in summer. It is strongly acid in reaction and low in content of phosphorus and potassium. Suitable grasses and legumes show good response to lime and fertilizer. The available water capacity is medium.

This soil is not suited to row crops, because of the slope. Most of the acreage has been cleared, but much of it is idle. Grasses and legumes can be grown if they have either shallow root systems or roots that can penetrate the fragipan. Tall fescue, white clover, lespedeza, and bermudagrass grow well if adequately fertilized. Alfalfa is poorly suited.

The slope and the fragipan make management difficult. Well-fertilized hay and pasture, managed to maintain ground cover, help to control erosion.

Wooded areas are few and small. The site is good for hardwoods, loblolly pine, and shortleaf pine. Pine is not native, but plantings up to 25 years of age show that it is fairly well suited. The hazard of erosion is severe, so protection is needed if roads and trails are built.

Much of this soil is idle, and the idle acreage produces native grasses, wild lespedeza, briers, cedars, and bushes, all of which furnish some food and cover for bobwhite quail, rabbits, and other wildlife. Cultivated crops are not suitable, but annual lespedeza and sericea lespedeza can be grown. These contribute to the supply of food for wildlife.

This soil is fairly well suited to the lawn grasses and shrubs commonly grown in this area and to ornamental plants that have shallow root systems or roots that can penetrate the fragipan. Some additional care is needed to control erosion until a lawn becomes established. Because of the restricted root zone, additional water may be needed during prolonged hot and dry periods. Grasses and many ornamentals show good response to fertilizer. (Capability unit VIe–2)

Grenada complex, 5 to 12 percent slopes, severely eroded (GgD3).—This soil is on hillsides, commonly adjacent to areas of less sloping Grenada soils. Erosion has removed all of the original surface layer (fig. 9), and the present plow layer consists mostly of original subsoil material. Numerous rills and shallow gullies have cut into the fragipan and have made the surface uneven. The present plow layer is compact, yellowish-brown silt loam mottled with gray and brown. In many places the fragipan is immediately under the plow layer. In many spots it is partly exposed, and in some, even part of the fragipan has been washed away.

The fragipan restricts most roots to the uppermost few inches. Because of the shallow root zone and rapid runoff, this soil is droughty in summer. It is strongly acid in reaction and low in natural fertility. It is friable and easy to work. The available water capacity is medium or low.

Figure 9.—**Severely eroded, strongly sloping Grenada soil. Light-colored areas show where the fragipan is exposed or is close to the surface.**

Most of this soil is idle and is either bare of vegetation or has a scrubby growth of weeds, broomsedge, briers, and bushes. It is poorly suited to row crops because of the slope and the erosion hazard. Only a small acreage is cultivated. Grasses and legumes that have shallow root systems or roots that can penetrate the fragipan can be grown. These include tall fescue, sericea lespedeza, and annual lespedeza.

The slope and the compact subsoil make management difficult. Well-fertilized hay and pasture help to control runoff and erosion.

The site is fair for pine trees, but productivity varies greatly from place to place because of differences in erosion and thickness of root zone. Seedling mortality ranges from slight to severe. The hazard of erosion is severe.

Most of this soil has only a sparse cover that provides little food or cover for wildlife. Tall fescue, sericea lespedeza, and annual lespedeza are fairly well suited, and they furnish some food for wildlife. (Capability unit VIe–2)

Graded land, silty materials (Gr).—This land type consists of areas that have been graded in preparation for subdivisions (fig. 10) and for commercial and industrial building. The depth to which these areas have been graded varies from a few inches to 5 feet or more and is most commonly about 3 feet. The slope, after grading, is generally between 1 and 5 percent.

Grenada, Loring, and Memphis soils were predominant in these areas before grading. In most areas the original soil profiles have been disturbed to such an extent that they no longer can be identified. The soil material is brown, yellowish brown, and dark brown in color and silty in texture.

The areas of this land type range in size from a few acres to about 400 acres. They are on the outer edges of the city of Memphis and in the county just outside the city. Included in some of the areas mapped were small areas of Filled land, silty.

Lawn grasses and ornamental plants and trees grow well if a good seedbed is prepared and enough fertilizer and water are applied. (Not in a capability unit)

Gullied land, silty (Gs).—This land type occurs as tracts 5 to 20 acres in size. It is mostly on hillsides where the slope ranges from 8 to 20 percent. Gullies make up 25 percent or more of each area. The gullies range from 3 to 15 feet in depth and from 5 to 80 feet in width. Except in small patches and narrow strips, the soil profiles have been destroyed. Between the gullies, sheet erosion has removed much of the original surface layer and subsoil. In some gullies sandy and gravelly Coastal Plain material is exposed.

Most areas of this land type were originally Memphis, Loring, or Grenada soils (fig. 11). The soil material is mostly brown or yellowish-brown, strongly acid, friable silt loam. In some areas it is mottled gray and brown, compact silt loam.

All of the acreage has been cleared. Some areas can be reclaimed at modest cost; others can be reclaimed only at high cost. A few small areas have been planted to pine, and some spots have reseeded to hardwoods. Most areas are idle or in unimproved pasture. These areas should be planted to pine trees or other vegetation that would stabilize them. Seedling mortality and plant competition range from slight to severe. (Capability unit VIIe–2)

Henry Series

This series consists of poorly drained, silty soils on broad flats. These soils formed in loess. They have a fragipan at a depth of about 20 inches.

Representative profile of Henry silt loam, a fourth of a mile west of Houston-Levee Road, 75 yards south of Dogwood Road:

Ap—0 to 9 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure; very friable; few small concretions; strongly acid; abrupt, smooth boundary.

A2g—9 to 20 inches, gray (10YR 5/1) silt loam; common, medium, dark grayish-brown, light brownish-gray, and brown mottles; weak, fine, granular structure; very friable; common medium voids and pores; common small concretions; very strongly acid; gradual, smooth boundary.

Bx1—20 to 31 inches, gray (10YR 5/1) silt loam; few, medium, dark-brown mottles; weak, fine, granular structure; many small pores and voids; vesicular; somewhat brittle; common dark-brown concretions; very strongly acid; clear, irregular boundary.

Bx2—31 to 50 inches, gray (10YR 5/1) silt loam; seams and tubes of gray silt; some polygons about 6 to 8 inches in diameter that break to weak, coarse, prismatic structure and weak, medium, subangular blocky; firm; brittle; top 4 inches of polygons have many thick clay films and clay flows; clay flows one-eighth of an inch thick between upper part of polygons; thin patchy clay films in lower part of this layer; clay films mostly on vertical faces; many very fine and fine pores; many brown concretions; very strongly acid; gradual, smooth boundary.

B3g—50 to 60 inches, grayish-brown (10YR 5/2) silt loam; common, medium, faint, gray and yellowish-brown mottles; weak, medium, subangular blocky structure; friable; common, thin, black stains in cracks and small holes; many fine pores; many small concretions; medium acid; gradual, smooth boundary.

C—60 to 90 inches, pale-brown (10YR 6/3) silt or silt loam; many, medium, light brownish-gray and yellowish-brown mottles; massive; friable; medium acid.

In some areas the reaction is neutral below a depth of 36 inches.

Henry silt loam (He).—This is a poorly drained, nearly level, silty soil. It occurs as tracts 5 to 100 acres in size. The upper 6 to 9 inches of the surface layer is brown to

Figure 10.—**Graded land, silty materials. This land type is used as sites for houses and other structures.**

Figure 11.—**Gullied land, silty. This area was probably Grenada silt loam before the gullies formed.**

grayish-brown, very friable silt loam. The lower part is gray, mottled, very friable silt loam. A fragipan begins at a depth of about 20 inches below the surface and is 18 to 30 inches thick. It is gray, mottled silt loam underlain by pale-brown, mottled silt or silt loam.

The depth to the fragipan ranges from 15 to 30 inches. Some areas have scattered alkali spots, or slick spots. These range from a few square feet to half an acre in size.

Surface runoff is slow or ponded. The uppermost 20 inches is readily penetrated by roots, water, and air. The subsoil is dense and poorly aerated. It restricts root growth and slows drainage. Slow drainage causes excessive wetness in winter and spring, and the shallow root zone causes droughtiness in summer. The available water capacity is medium. Tillage is easy after the excess water drains away. Some areas of this soil are flooded every few years. The reaction is strongly acid, and the natural fertility is low. The response to lime and fertilizer is good.

Much of the acreage has been cleared. If surface drainage is adequate, this soil is well suited to small grain, soybeans, sorghum, bermudagrass, tall fescue, white clover, and annual lespedeza. Cotton and corn grow fairly well in some years, but the probability of failure is high because the soil is slow to dry out in spring. Tall fescue and clover grow well, but the surface is too wet and too soft for grazing during much of the winter and spring.

Seasonal wetness is a major limitation. It can be overcome partly by selecting crops that grow in summer or tolerate wetness and partly by open-ditch drainage. Diversions are needed to intercept runoff from higher soils. Because of the slow internal movement of water, tile drains are not effective.

A row crop can be grown every year if adequate surface drainage is provided. Plowing under stalks and stubble helps to maintain the organic-matter content and to improve tilth. Large multiple-row equipment can be used.

About a fourth of the acreage is woodland. Existing stands consist mostly of willow oak, white oak, water oak, sweetgum, and southern red oak. The site is good for bottom-land oaks and sweetgum. Seasonal wetness is the main limitation. When the soil is wet in winter or early in spring, the use of heavy logging equipment may injure tree roots or compact the soil. In some places ponding may kill a substantial number of seedlings.

This soil is suited to soybeans, sorghum, millet, annual lespedeza, and other summer annuals that furnish food and cover for bobwhite quail, doves, and rabbits. Crop wastes contribute to the food supply. The wooded areas and brush along ditches furnish some food and cover. (Capability unit IIIw–1)

Iberia Series

This series consists of a poorly drained soil that formed in clay deposited by ponded water from the Mississippi River.

Representative profile of Iberia silt loam, 2 miles east of the Mississippi River, on Jackson Hill Road:

A11—0 to 2 inches, very dark gray (10YR 3/1) silty clay loam; moderate, medium, granular structure; friable to firm; neutral to mildly alkaline; abrupt, smooth boundary.

A12—2 to 14 inches, very dark gray (10YR 3/1) silt loam; common, medium, dark-brown and grayish-brown mottles; moderate, fine and medium, granular structure; friable; neutral or mildly alkaline; gradual, smooth boundary.

Bg—14 to 36 inches, dark-gray (10YR 4/1) clay; common, medium, dark-brown and dark reddish-brown mottles; weak, fine and medium, angular blocky structure; firm when moist, plastic and sticky when wet; neutral or mildly alkaline; clear, smooth boundary.

Cg—36 to 60 inches, dark-gray (10YR 4/1) clay; many, medium, dark-brown, dark reddish-brown, and dark yellowish-brown mottles; massive; plastic and sticky when wet; neutral to moderately alkaline.

The texture of the A horizon ranges from silt loam to silty clay loam, and the thickness ranges from 12 to 18 inches. Generally, the Bg and Cg horizons are clay to a depth of 5 feet or more.

Iberia silt loam (Ib).—This is a poorly drained, nearly black soil on low, broad flats on the Mississippi River bottoms. It has a very dark gray surface layer 12 to 18 inches thick and a subsoil of dark-gray, mottled clay. Most of the acreage is in Shelby Forest State Park. The areas are flooded in winter and spring every 3 or 4 years, and some are flooded every year.

This soil is high in natural fertility and is neutral to mildly alkaline in reaction. It has medium available water capacity. When moist, it has fair tilth and is easy to work, but it is wet and sticky most of the winter and early in spring, even when it is not flooded. The clay subsoil restricts the movement of roots, water, and air. A network of cracks about 1 inch wide forms in the uppermost 1 or 2 feet when the soil is dry.

This soil is suited to summer row crops, such as soybeans, that can be planted late. Because of wetness in spring and late planting dates, it is only fairly well suited to cotton and corn. Winter crops, such as small grain, generally are killed by the excess water in winter and spring. Pasture and hay crops, such as tall fescue, white clover, and lespedeza, grow well. Only a small acreage has been cleared.

Floods and standing water are the main limitations. Drainage ditches help to remove excess water, but little can be done to prevent floods in winter and spring. Smoothing and grading also improve surface drainage. The clay subsoil makes tile drains ineffective.

Most of the acreage is woodland. The site is good to excellent for bottom-land hardwoods. Existing stands consist of bottom-land oak, hackberry, sweetgum, sycamore, hickory, black willow, and cottonwood. Some cypress grows in the wetter spots. Excess water causes a moderate rate of seedling mortality. Standing water can be expected to kill some seedlings, especially the seedlings of Nuttall oak. Plant competition is severe because the natural fertility is high. Weeds, vines, and briers grow abundantly in new plantings and in openings in existing stands. Plantings of cottonwood and sweetgum need to be cultivated during the first year in order to survive and grow. Because of flooding and a high water table, the use of logging equipment usually has to be limited to the dry summer and fall months.

The woodlands contain many kinds of bottom-land hardwoods that provide food and cover for squirrels, wild turkey, and deer. The canebrakes in open spots in the woods provide refuge and a cool place for deer to bed down in the hot summer months. Floods and standing water attract waterfowl in winter. Cleared areas are suitable for growing soybeans, grain sorghum, lespedeza, and other summer annuals that provide food for wildlife. (Capability unit IIIw–3)

Levees and Borrow Pits (Lb).—This land type consists of the levee and of the borrow pit from which soil material was removed to build the levee. It is a strip that extends 4½ miles south from the Memphis Steam Plant, then 3 miles east, and ends at the bluffs just north of Horn Lake Creek. The distance of the north-south section from the river ranges from half a mile to 1 mile.

The levee is about 300 feet wide at the bottom, and it is 20 to 30 feet high. The sides are steep. The top, which is about 20 feet wide, has a gravel road. The borrow pit is along the western edge of the levee. It is about 300 feet wide and ranges from 10 to 15 feet in depth. Some segments of the pit hold water all year. The texture of the soil material in the levee and the borrow pit ranges from sand to clay. The levee protects about 6,000 acres in Ensley Bottoms from flooding.

The levee is a refuge for livestock and wildlife during floods. Grass on both sides of the levee provides some grazing. Weeds, willow trees, and cottonwood trees grow in the part of the borrow pit that is not ponded. The ponded areas attract waterfowl. Because of floods, little can be done to manage or control production of fish in these bodies of water. Rough fish generally are plentiful. (Capability unit VIe–3)

Loring Series

This series consists of deep, moderately well drained, nearly level to sloping, silty soils that have a fragipan. These soils formed in loess.

Representative profile of Loring silt loam, 2 to 5 percent slopes, 400 yards north of Pleasant Ridge Road, 100 feet east of the west property line of the Bolton School:

Ap—0 to 7 inches, brown (10YR 4/3) silt loam; weak, fine, granular structure; very friable; many fine roots; strongly acid; clear, smooth boundary.

B1—7 to 14 inches, brown (7.5YR 4/4) silt loam; moderate, fine and medium, subangular blocky structure; friable; few fine roots; few patchy clay films; strongly acid; clear, smooth boundary.

B2t—14 to 28 inches, brown (7.5YR 4/4) silt loam, strong brown (7.5YR 5/6) when crushed; moderate, medium, subangular blocky structure; firm; few fine roots; discontinuous clay films; strongly acid; clear, smooth boundary.

Bx1—28 to 32 inches, brown (7.5YR 4/4) silt loam; common, medium, faint mottles of strong brown and yellowish brown and common, medium, distinct mottles of light brownish gray; moderate, medium, subangular blocky structure; firm; compact; slightly brittle; few gray silt coats and seams; patchy clay films; strongly acid; clear, wavy boundary.

Bx2—32 to 40 inches, brown (7.5YR 4/4) silt loam; common, medium, distinct mottles of gray, yellowish brown, and strong brown; some light brownish-gray ped faces; weak, medium and coarse, prismatic structure that breaks to moderate, medium, subangular blocky; compact; brittle; common gray silt coats on prism faces and in cracks; patchy clay films;

few dark-brown concretions; strongly acid; gradual, wavy boundary.

Bx3—40 to 50 inches, brown (7.5YR 4/4) silt loam; common, medium, distinct mottles of gray and strong brown; weak, medium and coarse, prismatic structure that breaks to weak, medium, subangular blocky; friable; common gray silt coats on prism faces and in cracks; thin patchy clay films on some vertical faces; strongly acid; gradual, smooth boundary.

C—50 to 60 inches, brown (7.5YR 4/4) silt loam; few, medium, distinct mottles of gray and few, medium, faint mottles of strong brown; structureless; massive; friable; medium acid.

The depth to the fragipan depends on the extent of erosion and ranges from 12 to 30 inches.

Loring silt loam, 2 to 5 percent slopes (LoB).—This is a deep, moderately well drained or well drained soil on broad ridgetops. It has the profile described as typical for the series. The plow layer is brown, very friable silt loam about 7 inches thick. The subsoil is brown, friable to firm silt loam. A weak fragipan begins at a depth of about 28 inches below the surface and ranges from about 12 to 25 inches in thickness. It is brown silt loam mottled with shades of gray and brown. Below the fragipan is brown, friable silt loam that extends to a depth of several feet.

This soil is strongly acid in reaction and medium in content of phosphorus and potassium. The response to fertilizer and lime is good. Roots, air, and water readily penetrate this soil to a depth of about 28 inches. The weak fragipan slightly retards root growth, aeration, and drainage. This soil is easy to work and to keep in good tilth. The available water capacity is high. If runoff is controlled, plants generally have a good supply of moisture.

This soil is used mainly for crops and pasture. Most of the acreage is cultivated. Cotton, corn, and soybeans are the main crops, but many others can be grown. Some tracts are in hay and pasture.

The slope is the main limitation. Row crops should not be grown every year. A suitable cropping system, adequate fertilization, and control of runoff will conserve the soil. An example of a suitable cropping system is a row crop every other year, or 2 years of a row crop, followed by 2 years of hay or pasture. Farming on the contour (fig. 12) with a system of terraces and grassed waterways reduces runoff and conserves water. Large machinery can be used.

Only small tracts are wooded. The site is good for white oak, red oak, yellow-poplar, black walnut, and other upland hardwoods and for loblolly pine. Problems in managing woodland are slight.

This soil is well suited to many kinds of plants that provide food and cover for bobwhite quail, doves, and rabbits. Wastes left after soybeans, corn, and small grain are harvested contribute to the food supply. Seri-

Figure 12.—Farming on the contour. The soil is Loring silt loam, 2 to 5 percent slopes.

cea lespedeza and autumn olive can be planted in field borders and fence rows. The seeds of weeds, wild lespedeza, and other native plants that grow along field borders furnish additional food. The small wooded areas and the brush in odd-shaped areas in field corners and along fence rows furnish some food and cover. Fields managed specifically for doves can be planted to a summer annual, such as browntop millet, which matures quickly and so can be planted after a small-grain crop has been harvested.

This soil is well suited to the lawn grasses, flowers, and ornamental plants commonly grown in this region. Roses and azaleas, which require a deep, friable soil, grow well. Many fruit-bearing or berry-bearing ornamental plants, such as pyracantha, dogwood, and some kinds of holly, also grow well. Plantings of these in urban areas add beauty and attract songbirds. (Capability unit IIe–1)

Loring silt loam, 2 to 5 percent slopes, eroded (LoB2).—This is a deep, moderately well drained soil on ridgetops. The plow layer is brown, friable silt loam 5 to 7 inches thick. The subsoil is brown, friable silt loam that extends to a depth of about 2 feet. A weak fragipan begins at a depth of about 2 feet and ranges from 12 to 24 inches in thickness. It is brown silt loam mottled with shades of gray and brown. Below the fragipan is brown silt loam that extends to a depth of several feet.

This soil is moderate in natural fertility and strongly acid in reaction. It has a high available water capacity. It has good tilth and is easy to work. Roots, water, and air penetrate readily to a depth of about 2 feet. The fragipan slightly retards the movement of water and air and restricts root growth. The response to lime and fertilizer is good. If runoff is controlled, plants have a good supply of moisture.

Most of this soil is used for crops and pasture. Cotton, corn, and soybeans are the main row crops. Some tracts are used for pasture and hay. Many other crops can be grown, including deep-rooted perennials, such as alfalfa.

The slope is the main limitation. Row crops should not be grown every year. A suitable cropping system, adequate fertilization, and control of runoff will conserve the soil. An example of a suitable cropping system is a row crop every other year, or 2 years of row crops followed by 2 years of close-growing hay or pasture crops. Farming on the contour with a system of terraces and grassed waterways reduces runoff, conserves moisture, and controls erosion.

The wooded areas occur as small tracts. The site is good for white oak, red oak, yellow-poplar, black walnut, and other upland hardwoods and for loblolly pine. There are no major problems in the management of woodland.

Many annual and perennial plants that furnish food and cover for bobwhite quail, doves, and rabbits are suited to this soil. Wastes left when such crops as soybeans and small grain are harvested contribute to the food supply. The seeds of annual lespedeza and sericea lespedeza furnish some food. Weeds, sumac, wild lespedeza, and other native plants that grow along field borders and in idle areas provide some food and cover. Autumn olive, pyracantha, and shrub lespedeza are among the food and cover plants that can be grown.

This soil is well suited to the lawn grasses and ornamental plants commonly grown in this region. Many annual and perennial flowering plants and shrubs that require a deep, friable, well-drained soil grow well on these tracts. Fruit-bearing or berry-bearing ornamentals, such as pyracantha, dogwood, and some kinds of holly, attract birds to urban and residential areas. (Capability unit IIIe–1)

Loring silt loam, 5 to 8 percent slopes, eroded (LoC2).—This is a deep, moderately well drained soil on hillsides. The plow layer is brown, friable silt loam. It consists mostly of former subsoil material. The subsoil is brown, friable silt loam that extends to a depth of 16 to 24 inches. A weak fragipan begins at a depth of 16 to 24 inches and is 12 to 20 inches thick. This layer is brown silt loam mottled with shades of gray and brown. Below the pan is several feet of brown, friable silt loam.

This soil is medium acid or strongly acid in reaction and moderate in content of phosphorus and potassium. The response to lime and fertilizer is good. Roots, water, and air readily penetrate the layers above the fragipan. The fragipan slightly restricts the growth of some plant roots and the movement of water and air. Though a few clods form in the plow layer in many tracts, the soil is fairly easy to work and to keep in good tilth. The available water capacity is high. If runoff is controlled, plants generally have a good supply of moisture.

If properly limed and fertilized, this soil is well suited to cotton, corn, and soybeans and to pasture and hay. Most of the acreage has been cleared and is used for row crops and pasture.

The slope and the resulting erosion hazard are the main limitations. A suitable cropping system, adequate fertilization, and other practices to control runoff and erosion are needed. An example of a suitable cropping system is 1 year of a row crop and 3 years of grass and legumes. Either contour stripcropping or contour cultivation with a system of terraces and grassed waterways helps to control runoff and erosion.

A few small tracts are wooded. The site is good for white oak, red oak, yellow-poplar, black walnut, and other upland hardwoods and for loblolly pine. Plant competition is moderate. Abandoned fields and openings where planting is needed may need site preparation, cultivation, and weeding. The hazard of erosion is moderate. Protection from erosion must be provided if roads and trails are built.

This soil is suited to many plants that furnish food and cover for wildlife. Some of the commonly grown crops, such as soybeans, small grain, and lespedeza, contribute to the food supply. Native plants, such as weeds, wild lespedeza, and sumac, which grow along field borders and in idle areas, provide additional food and cover. Autumn olive, sericea lespedeza, and shrub lespedeza are among the food and cover plants that are suitable for use in odd-shaped corners and field borders. Oak, hickory, beech, and dogwood trees furnish some food and cover for wildlife, especially squirrels.

This soil is well suited to lawn grasses and ornamental plants and to many annual and perennial flowering plants. Roses and most ornamentals that require a deep, friable soil grow well. Fruit-bearing or berry-bearing ornamental plants, such as dogwood, pyracantha, and

some kinds of holly, attract songbirds and other nongame birds to urban areas. Lawn grasses and most flowering and ornamental plants respond to fertilizer. (Capability unit IIIe–1)

Loring silt loam, 8 to 12 percent slopes (LoD).—This is a deep, moderately well drained soil on hillsides. The surface layer is brown, very friable silt loam 6 to 10 inches thick. The topmost 2 or 3 inches has dark stains left by decayed leaves. The subsoil is brown, friable silt loam that extends to a depth of about 30 inches. A weak fragipan begins at a depth of about 30 inches. This layer is brown silt loam mottled with shades of gray and brown. It is 12 to 18 inches thick. Below the fragipan is a layer of brown silt loam several feet thick.

This soil is strongly acid in reaction and moderate in content of phosphorus and potassium. Roots, water, and air readily penetrate the topmost 30 inches. The fragipan slightly restricts the growth of some plant roots and retards the movement of water and air. The available water capacity is high.

If cleared, this soil is well suited to hay and pasture and to deep-rooted perennials, such as alfalfa, but it is poorly suited to row crops because it erodes easily. An example of a suitable cropping system is 1 year of a row crop and at least 3 years of grasses and legumes. The row crop should be grown in contour strips. The slopes are too steep for terracing. Only a few small areas have been cleared.

Most of the acreage is woodland from which several crops of trees have been harvested. Existing stands consist of many kinds of upland hardwoods. The site is good for white oak, red oak, yellow-poplar, black walnut, and other upland hardwoods and for loblolly pine. Loblolly pine is not native, but plantings up to 25 years of age show that it is well suited. Plant competition and the hazard of erosion are moderate management problems. Openings where planting is needed may need site preparation, cultivation, and weeding. Unnecessary disturbance of the soil should be avoided. Protection from erosion must be provided if roads and trails are built.

The upland hardwoods that grow on this soil furnish food and cover for wildlife. Among the suitable hardwoods are oak, hickory, beech, black walnut, and dogwood. Annual lespedeza, sericea lespedeza, shrub lespedeza, and autumn olive are among the food and cover plants that can be planted along the edge of woods. Sumac, wild plum, and other native plants that grow along the edge of woods supply additional food and cover.

This soil is well suited to the lawn grasses and ornamental plants commonly grown in this region, but very little of it is in urban areas. (Capability unit IVe–1)

Loring silt loam, 8 to 12 percent slopes, eroded (LoD2).—This is a moderately well drained soil on hillsides. The plow layer is brown, friable silt loam. It consists of former subsoil material mixed with some of the original surface layer. The subsoil is brown, friable silt loam that extends to a depth of 12 to 22 inches. A fragipan begins at a depth of 12 to 22 inches. This layer is brown silt loam mottled with shades of gray and brown. It is 12 to 24 inches thick. Below the fragipan is a layer of brown silt loam several feet thick. In some tracts there are a few rills and shallow gullies.

This soil is strongly acid in reaction and moderately low in content of phosphorus and potassium. The response to lime and fertilizer is good. Roots, water, and air readily penetrate the uppermost 12 to 22 inches. The fragipan slightly restricts the growth of some roots and retards the movement of water and air. Generally, the soil is easy to work and to keep in good tilth. In some tracts clods form in the surface layer. The available water capacity is high. If runoff is controlled, plants have a good supply of moisture.

Some of this soil is used to grow row crops, although the slope makes it marginal for crops. Many tracts are idle; some are used to grow hay and pasture. Much of the pasture consists of wild grasses and legumes. An example of a suitable cropping system is 2 years of a row crop, then 6 years of grasses and legumes for hay or pasture. Row crops should be grown on the contour or in contour strips. The slope is too steep for terracing. Fescue, bermudagrass, and lespedeza are suitable hay and pasture plants.

The few wooded spots are small and irregular in shape. The site is good for white oak, red oak, yellow-poplar, black walnut, and other upland hardwoods and for loblolly pine. Plant competition is moderate. Abandoned fields may need site preparation, cultivation, and weeding. The hazard of erosion is moderate. Protection from erosion must be provided if roads and trails are built.

This soil is suited to many perennial plants that provide food and cover for wildlife, though it is not suited to annual cultivated crops. Sericea lespedeza, tall fescue, annual lespedeza, and white clover protect the soil and furnish some food. Autumn olive, shrub lespedeza, and pyracantha are among the perennials that can be planted in odd-shaped idle areas, along field borders, and in fence rows. The wild grasses and legumes that grow on many tracts of this soil provide additional food and cover. (Capability unit IVe–1)

Loring silt loam, 5 to 12 percent slopes, severely eroded (LoD3).—This is a moderately well drained soil on hillsides. It occurs as tracts 5 to 30 acres in size, in the eastern half of the county. Erosion has removed all of the original surface layer and much of the former subsoil. The surface layer is brown, friable silt loam. The subsoil is brown, friable silt loam that extends to a depth of 12 to 18 inches. A weak fragipan begins at a depth of 12 to 18 inches and is 10 to 24 inches thick. This layer is brown silt loam mottled with shades of gray and brown. Below this is brown silt loam that is several feet thick. Shallow gullies cut into the fragipan.

This soil is strongly acid in reaction and moderately low in content of phosphorus and potassium. The response to lime and fertilizer is generally good. The available water capacity is medium. Roots, water, and air readily penetrate the uppermost 12 to 18 inches. The fragipan slightly restricts the growth of some roots and the movement of water and air. If runoff is held to a minimum, plants generally have a good supply of moisture. The soil is generally easy to work and to keep in good tilth.

This soil is poor for row crops. All of it has been cleared, but ony a small part is cultivated. The gullies make tillage with most farm machinery difficult. Pasture and hay crops, including tall fescue, white clover, ber-

mudagrass, and alfalfa, are suitable. These crops are difficult to establish, but they respond to heavy applications of lime and fertilizer. Grazing is possible during winter because the surface does not get wet and soft. Some areas are in poor native pasture.

This soil erodes easily if not protected. Control of runoff is the main management problem. Well-fertilized pastures of grasses and legumes, if not overgrazed or mowed too closely, help to reduce runoff and limit erosion.

Little or none of this soil is woodland. Most of it is idle and has a scrubby growth of broomsedge, briers, and bushes and a sparse stand of cedars. The site is good for red oak, white oak, yellow-poplar, black walnut, and other upland hardwoods and for loblolly pine. Plant competition is moderate. Abandoned fields where trees are to be planted may need site preparation, cultivation, and weeding. Because of the severe hazard of erosion, protection must be provided if roads and trails are built.

This soil is suited to many perennial plants that provide food and cover for wildlife. Sericea lespedeza, tall fescue, and bermudagrass protect the soil and furnish some food. Autumn olive, pyracantha, and shrub lespedeza are among the perennials that can be planted in idle areas and along field borders. Many native plants, such as sumac, wild plum, wild lespedeza, briers, and bushes, provide some food and cover. (Capability unit VIe–1)

Memphis Series

This series consists of deep, well-drained, strongly acid, silty soils on uplands. These soils formed in loess that ranges in thickness from about 100 feet in the western part of the county to about 4 feet on the hilly slopes in the eastern part of the county.

Representative profile of Memphis silt loam, 2 to 5 percent slopes, 3 miles north of Eads, 20 yards west of Collierville-Arlington Road:

Ap—0 to 7 inches, brown (10YR 4/3) silt loam; weak, fine, granular structure; very friable; strongly acid; abrupt, smooth boundary.

B21t—7 to 18 inches, brown (7.5YR 4/4) to reddish-brown (5YR 4/4) silty clay loam; moderate, fine and medium, subangular blocky structure; friable; thin continuous clay films; strongly acid; gradual, smooth boundary.

B22t—18 to 36 inches, brown (7.5YR 4/4) to reddish-brown (5YR 4/4) silt loam; moderate, medium, subangular blocky structure; friable; thin continuous clay films; strongly acid; gradual, smooth boundary.

B23t—36 to 74 inches, brown (7.5YR 4/4) silt loam; weak, coarse, subangular blocky structure; friable; few pale-brown silt coatings in old root channels and cracks; thin patchy clay films; few, small, black concretions; strongly acid; clear, smooth boundary.

C—74 to 108 inches; dark-brown (7.5YR 3/2) silt loam; massive; firm; pale-brown silt coatings in cracks; strongly acid.

The color of the Ap horizon ranges from dark grayish brown to brown. The texture of the B21 horizon ranges from heavy silt loam to silty clay loam. The color of the B horizon ranges from brown to reddish brown.

Memphis silt loam, 2 to 5 percent slopes (MeB).—This is a deep, well-drained soil on broad tops of low-lying hills. The plow layer is brown, very friable silt loam 7 inches thick. The uppermost 10 to 20 inches of the subsoil is brown to reddish-brown, friable silty clay loam. Below this is brown to reddish-brown, friable silt loam several feet thick.

In some places the texture of all layers is silt loam, but in most places the layer immediately below the surface layer is slightly more clayey than the one above or below it. The more clayey layer is approximately 12 inches thick. Included in mapping were a few small wooded areas that have a surface layer as much as 12 inches thick.

This soil is strongly acid or medium acid in reaction and moderately high in content of phosphorus and potassium. The response to fertilization and other good management practices is good. The root zone is very deep. The available water capacity is high.

This is one of the most productive upland soils in the State and one of the most extensive soils in the county. Except for about 35 percent of the acreage, which is in urban development, the soil is used mainly for cotton, soybeans, and corn. If adequately fertilized and otherwise well managed, it is also suited to lespedeza, alfalfa, white clover, tall fescue, orchardgrass, and all other crops commonly grown in this region.

Runoff is the main limitation. Control of erosion is the main management problem. Even though the slope is gentle, some washing occurs if this soil is cultivated. Clean-tilled row crops should not be grown every year. A suitable cropping system, adequate fertilization, and control of runoff will conserve the soil. An example of a suitable cropping system is a row crop every other year, or 2 years of a row crop followed by 2 years of hay or pasture. The slopes are well suited to contouring, terracing, and stripcropping. Grass should be established in the natural watercourses. Heavy applications of fertilizer can be used.

The suitable crops provide a good vegetative cover and a large amount of crop residue. The vegetative cover helps to control runoff and to conserve moisture. The crop residue helps to maintain the organic-matter content and to keep the soil in good tilth.

The wooded areas occur as small tracts. The site is good for white oak, red oak, yellow-poplar, and other upland hardwoods and for loblolly pine. Loblolly pine is not native, but trial plantings up to 20 years of age show that it is well suited. Mainly because of a lack of suitable seed trees, natural regeneration cannot always be relied upon to provide adequate stocking of high-value trees. Plant competition is moderate. In natural stands it may be necessary to plant seedlings and remove cull trees, low-value trees, and bushes.

This soil is well suited to many plants that furnish food and cover for bobwhite quail, doves, and rabbits. Wastes left when such crops as soybeans, corn, and small grain are harvested and the seeds of weeds, lespedeza, and native plants that grow along field borders furnish food. The small wooded areas and the brush in the odd-shaped areas in the corners of fields and along old fence rows provides some cover. Annuals and perennials can be planted in field borders and along fence rows. Fields managed specifically for doves can be planted to browntop millet, which matures quickly and so can be planted after a small-grain crop has been harvested.

About a third of the acreage is in urban areas. Because it is deep, well drained, and friable, this soil is well

suited to the lawn grasses, flowers, and ornamental plants commonly grown in yards and parks in this region. Roses and azaleas are among the plants that grow well. Plantings of fruit-bearing or berry-bearing ornamentals, such as autumn olive, pyracantha, dogwood, and some kinds of holly, add beauty and attract songbirds. (Capability unit IIe–1)

Memphis silt loam, 2 to 5 percent slopes, eroded (MeB2).—This is a deep, well-drained, brown soil that formed in loess 15 to 80 feet thick. It has been cleared and cropped for many years. Erosion has removed much of the original surface layer. The present plow layer is brown, friable silt loam that is a mixture of the surface soil and subsoil. The uppermost 12 inches of the subsoil is brown or reddish-brown, friable silty clay loam. Below this is several feet of brown, friable silt loam.

This soil is strongly acid to slightly acid in reaction and moderately high in natural fertility. The response to lime and fertilizer is good. Roots, water, and air readily penetrate to a depth of several feet. The available water capacity is high. Plants generally have a good supply of moisture.

This soil is used for row crops, hay, and pasture. If fertilized and otherwise well managed, it is suited to corn, cotton, soybeans, small grain, lespedeza, white clover, tall fescue, orchardgrass, and other crops commonly grown in this region.

Control of runoff is the main management problem. The soil is silty and erodes easily when cultivated. A suitable cropping system, adequate fertilization, and other practices to control runoff and erosion are needed. If this soil is cultivated on the contour, an example of a suitable cropping system is 1 year of a row crop and 1 year of a small grain, followed by 3 or 4 years of grass and legumes. Because of the fairly long slopes, terracing is especially helpful in controlling erosion. Grass should be established in the natural watercourses. Proper fertilization helps to insure large amounts of crop residue. When left on the surface, the residue provides protection from erosion. When returned to the soil, it helps to maintain the organic-matter content and to keep the soil in good tilth.

The site is good for white oak, red oak, yellow-poplar, black walnut, and other upland hardwoods and for loblolly pine. Loblolly pine is not native, but trial plantings up to 20 years of age show that it is well suited. Plant competition is moderate. Abandoned fields where planting is needed may need site preparation, cultivation, and weeding.

Many annual and perennial plants that furnish food and cover for bobwhite quail, doves, and rabbits can be grown on this soil. Autumn olive, pyracantha, and shrub lespedeza are among the perennials suitable for planting. Wastes left when such crops as soybeans and small grain are harvested and the seeds of annual lespedeza and sericea lespedeza furnish some food. Native plants that grow along field borders and in idle areas provide some food and cover.

The lawn grasses, flowers, and ornamental plants commonly grown in yards and parks in this region grow well on this soil. Many of these plants show good response to fertilizer. Plantings of fruit-bearing or berry-bearing ornamentals, such as autumn olive, pyracantha, dogwood, and some kinds of holly, add to the beauty of the area and attract songbirds. (Capability unit IIIe–1)

Memphis silt loam, 5 to 8 percent slopes, eroded (MeC2).—This is a deep, well-drained soil that formed in loess 5 to 80 feet thick. It occurs as scattered tracts 5 to 50 acres in size in the central part of the county. It is mostly on the tops of long, narrow, winding, low-lying hills, although some areas are on rather short hillsides. Erosion has removed much of the original surface layer. The plow layer is brown, friable silt loam about 6 inches thick. It consists partly of original subsoil material. The uppermost 9 inches of the subsoil is brown, friable silty clay loam. Below this is several feet of brown silt loam. There are a few small wooded tracts that have a surface layer 8 to 10 inches thick.

This soil is strongly acid to slightly acid in reaction and is moderately high in natural fertility. The response to lime and fertilizer and to other good management practices is good. Roots, water, and air readily penetrate the soil. The root zone is very deep. The available water capacity is high. If surface runoff is controlled, plants have a good supply of moisture.

This soil is used for growing cotton, soybeans, and pasture crops. If adequately fertilized and otherwise well managed, it is suited to all the commonly grown crops. Most of the acreage is cultivated or in pasture.

Control of erosion is the main management problem. A suitable cropping system, adequate fertilization, and control of runoff will conserve the soil. An example of a suitable cropping system is 1 year of a row crop, then 2 years of grass and legumes. All cultivation should be on the contour. Where the slopes are long enough, a system of stripcropping helps to control erosion. Grass should be established in the natural watercourses.

Proper fertilization promotes the growth of stalks and roots. Residue left on the surface helps to protect the soil, to maintain the organic-matter content, and to keep the soil in good tilth.

The site is good for white oak, red oak, yellow-poplar, black walnut, and other upland hardwoods and for loblolly pine. Plant competition is moderate. Abandoned fields and openings where planting is needed may need site preparation, cultivation, and weeding. Because of the hazard of erosion, protection must be provided if roads and trails are built.

Many annual and perennial plants that provide food and cover for wildlife are suited to this soil. Some of the commonly grown crops, such as soybeans, small grain, and lespedeza, contribute to the food supply. The seeds of weeds, lespedeza, and native plants that grow along field borders and in idle areas furnish additional food. The wooded areas provide some food and cover for wildlife, especially for squirrels. Autumn olive, pyracantha, and shrub lespedeza are among the food and cover plants that are suitable for use in odd-shaped corners and field borders.

This soil is suited to the lawn grasses, flowers, and ornamental plants commonly grown in this region. Roses and most ornamentals that require a deep, well-drained soil grow well. Lawn grasses and most flowers and ornamentals show good response to fertilizer. (Capability unit IIIe–1)

Memphis silt loam, 8 to 12 percent slopes, eroded (MeD2).—This is a deep, well-drained soil on short hillsides. Erosion has removed much of the original surface layer. The plow layer is brown, friable silt loam about 6 inches thick. The uppermost 9 inches of the subsoil is brown, friable silty clay loam. Below this is brown, friable silt loam that extends to a depth of several feet.

Most areas have a smooth surface, but some have a few shallow gullies or prints of gullies that have been filled. There are a few small wooded tracts where the surface layer is 8 to 10 inches thick.

This soil is strongly acid to slightly acid in reaction and moderately high in natural fertility. The response to lime and fertilizer is good. The soil is readily penetrated by roots, water, and air and is easily kept in good tilth. The root zone is very deep. The available water capacity is high. If surface runoff is controlled, plants have a good supply of moisture.

This soil is used for row crops, pasture, and hay, but most of it is idle or in pasture. If adequately fertilized and otherwise well managed, it is suited to many crops, among them cotton, corn, soybeans, alfalfa, tall fescue, bermudagrass, white clover, and lespedeza. Because of slope and the hazard of erosion, the soil is not suitable for frequent cultivation. It can produce good pasture and can be grazed throughout the year because the surface does not get wet and soft during winter.

Control of erosion is the main management problem. A suitable cropping system, adequate fertilization, contour cultivation, and diversion of runoff will conserve the soil. An example of a suitable cropping system is a row crop a fourth of the time and grass and legumes the rest of the time. Grass should be established in the natural watercourses. The slopes are generally too short for stripcropping and too steep for terracing.

Only small tracts are wooded. The existing stands consist of upland hardwoods. The site is good for white oak, red oak, yellow-poplar, black walnut, and other upland hardwoods and for loblolly pine. Because of a lack of suitable seed trees, natural regeneration cannot be relied upon to provide adequate restocking of high-value trees. Plant competition is moderate. Abandoned fields and openings where planting is needed may need site preparation, cultivation, and weeding. Because of the hazard of erosion, protection must be provided if roads and trails are built.

Many annual and perennial plants that furnish food and cover for quail grow well on this soil. Such crops as annual lespedeza contribute to the food supply. Many perennials, such as autumn olive, pyracantha, sericea lespedeza, and shrub lespedeza, can be planted in odd-shaped idle areas and field borders. In the wooded areas, oak, hickory, dogwood, and other upland hardwoods furnish some food and cover for wildlife, especially squirrels. (Capability unit IVe–1)

Memphis silt loam, 5 to 12 percent slopes, severely eroded (MeD3).—This is a deep, well-drained soil that has short, rolling slopes. The soil is silty to a depth of 20 feet or more. The plow layer is brown, friable silt loam that originally was subsoil material. It is slightly sticky when wet. Below the plow layer is about 6 to 10 inches of brown silt loam or silty clay loam. Below this is several feet of brown or dark-brown, friable silt loam. In places some gray mottles occur below a depth of 30 inches. The surface is uneven, and there are many shallow gullies.

This soil is strongly acid or medium acid in reaction and moderately high in natural fertility. Response to lime and fertilizer is good. Roots, water, and air readily penetrate the soil. The root zone is deep. The available water capacity is high. If runoff is controlled, plants have a good supply of moisture.

Only a small part of this soil is cultivated. Most of it is idle or in low-quality pasture. The uneven surface makes tillage with most farm machinery difficult. If adequately fertilized and otherwise well managed, the soil is suited to many crops, among them cotton, corn, soybeans, alfalfa, tall fescue, bermudagrass, white clover, and lespedeza.

This soil erodes easily when cultivated, and control of erosion is the main management problem. A suitable cropping system, proper fertilization, contour cultivation, stripcropping, and diversion of runoff will conserve the soil. An example of a suitable cropping system is a row crop a fourth of the time and grass and legumes the rest of the time; for example, 2 years of a row crop, then 6 years of grass and legumes. Proper fertilization promotes the growth of roots and stalks, which protect the soil and help to improve tilth. Grass should be established in the natural watercourses.

Some of the idle areas have a sparse cover of cedars, briers, and broomsedge. The site is good for upland hardwoods and for loblolly pine. Plant competition is moderate. Abandoned fields where planting is needed may need site preparation, cultivation, and weeding. Mainly because of a lack of suitable seed trees, natural regeneration cannot be relied upon to provide restocking. Because of the severe hazard of erosion, protection must be provided if roads and trails are built.

Annual lespedeza and sericea lespedeza, which grow well on this soil, contribute to the supply of food for wildlife. Autumn olive, pyracantha, and shrub lespedeza are among the food and cover plants that can be grown in idle areas and field borders. Many native plants, such as wild lespedeza, briers, and bushes, furnish some food and cover. (Capability unit IVe–1)

Memphis silt loam, 12 to 20 percent slopes (MeE).—This is a deep, well-drained soil that has short slopes. The plow layer is brown, friable silt loam that is a mixture of the original surface layer and the subsoil. The uppermost 12 inches of the subsoil is brown silt loam or silty clay loam. Below this is friable silt loam that extends to a depth of several feet. The wooded areas have a surface layer of very dark grayish-brown, friable silt loam. A few shallow gullies have formed in some areas.

This soil is strongly acid to slightly acid in reaction and moderately high in natural fertility. The response to lime and fertilizer is good. Roots, water, and air penetrate readily. The available water capacity is high. If surface runoff is controlled, plants generally have a good supply of moisture.

Very little of this soil is used for row crops. Because of rapid runoff and severe erosion, row crops are poorly suited. Most areas are idle and have a scrubby growth of briers, bushes, cedars, and volunteer grasses. Some areas are in pasture. Tall fescue, white clover, red

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clover, bermudagrass, and lespedeza are suitable hay and pasture plants. Many kinds of grasses and legumes grow well under good management. Grazing is possible during winter because the surface is not wet and soft.

This soil erodes easily if not protected. Control of runoff is the main management problem. Well-fertilized pastures of grasses and legumes, if not overgrazed or mowed too closely, help to reduce runoff and to limit erosion.

The wooded tracts are fairly small. The existing stands consist of many kinds of upland hardwoods. The site is good for white oak, red oak, yellow-poplar, black walnut, and other upland hardwoods and for loblolly pine. Plant competition is moderate. The hazard of erosion is severe. Because of a lack of suitable seed trees, natural regeneration cannot always be relied upon to provide adequate restocking of high-value trees. In natural stands it may be necessary to plant seedlings and remove cull trees, low-value trees, and bushes. Abandoned fields and openings where planting is needed may need site preparation, cultivation, and weeding. Unnecessary disturbance of the soil should be avoided.

Many annual and perennial plants that furnish food and cover for wildlife can be grown on this soil. Crops such as annual lespedeza contribute to the food supply. Autumn olive, sericea lespedeza, shrub lespedeza, and pyracantha are among the perennials that can be planted in odd-shaped fields and field borders. In wooded areas, oak, hickory, beech, black walnut, and dogwood trees provide some food and cover for wildlife, especially for squirrels. (Capability unit VIe–1)

Memphis silt loam, 12 to 30 percent slopes, severely eroded (MeF3).—This is a deep soil on hillsides. It occurs as tracts 10 to 50 acres in size, mostly in the western half of the county. Erosion has removed most of the original surface layer and much of the subsoil. The plow layer consists mostly of brown, friable silt loam that originally was subsoil material. It is about 4 inches thick. The uppermost 6 inches of the subsoil is brown, friable silty clay loam. Below this is brown silt loam that extends to a depth of several feet. In many places erosion has removed the silty clay loam layer, and the texture throughout the profile is silt loam. There are many rills and gullies, and the surface is uneven.

This soil is strongly acid to slightly acid in reaction and moderately high in natural fertility. The response to lime and fertilizer is good. Roots, water, and air penetrate readily. The available water capacity is high. If runoff is controlled, plants generally have a good supply of moisture.

Because of rapid runoff and the severe hazard of erosion, this soil is poorly suited to row crops. The slope and the uneven surface make the operation of farm machinery difficult. Most areas are idle and have a scrubby growth of briers, bushes, cedars, and volunteer grasses. Some areas are in pasture. Tall fescue, white clover, bermudagrass, and lespedeza are among the suitable hay and pasture crops. Many kinds of grasses and legumes grow well under good management. Grazing is possible during winter because the surface does not get too wet and too soft.

This soil erodes easily if not protected. Control of runoff is the main management problem. Well-fertilized pastures of grasses and legumes, if not overgrazed or mowed too closely, help to reduce runoff and limit erosion.

The site is fairly good for loblolly pine, which can be used as a nurse crop to reestablish upland hardwoods. Plant competition is moderate. Abandoned fields where planting is needed may need site preparation and weeding. The slope is a moderate limitation on the use of equipment. If unprotected, the soil erodes rapidly. Gully erosion is especially likely. Because of the severe hazard of erosion, protection must be provided if roads and trails are built.

This soil is too steep and too eroded to be cultivated every year, but annual and perennial plants that provide food and cover for wildlife can be grown. The plants in idle areas furnish some food and cover. Autumn olive, sericea lespedeza, shrub lespedeza, and annual lespedeza are among the plants that can be grown to attract birds. (Capability unit VIe–1)

Memphis silt loam, 30 to 65 percent slopes (MeG).—This is a well-drained soil on hillsides that form deep, narrow, meandering, V-shaped valleys as they slope from the narrow, winding ridgetops. The soil formed in loess 20 to 80 feet thick. It occurs as large tracts on the steep bluffs adjacent to the Mississippi River bottoms. The surface layer is brown, very friable silt loam 5 to 8 inches thick. In the uppermost 3 inches there are dark stains from decayed leaves. The subsoil is brown, friable silt loam several feet thick. The depth to alkaline loess ranges from 4 to 6 feet. A few gullies have formed in most areas. Included in mapping were a few areas where the soil is underlain by sand at a depth of 30 to 40 inches.

This soil is medium acid in reaction and moderately high in natural fertility. It is readily penetrated by roots, water, and air. The available water capacity is high, and the root zone is deep. Plants generally have a good supply of moisture.

Very little of this soil has been cleared. Because of the slope, it is unsuited to crops, pasture, or hay. Surface runoff is rapid, and the hazard of erosion is severe.

Most of the acreage is woodland. The existing stands consist mainly of upland hardwoods. The site is good to excellent for oak, hickory, yellow-poplar, and other upland hardwoods. Plant competition is moderate. The slope is a moderate to severe limitation on the use of equipment. The severe hazard of erosion must be considered if roads and trails are built.

Such trees as upland oaks, hickory, beech, black walnut, and dogwood furnish food and cover to many kinds of wildlife, including deer, wild turkey, and squirrels. (Capability unit VIIe–1)

Robinsonville Series

This series consists of deep, well-drained, neutral to moderately alkaline, level soils on young natural levees along the Mississippi River. These soils formed in recent deposits of loamy sediment.

Representative profile of Robinsonville silt loam, three-fourths of a mile east of the Mississippi River and 50 yards south of the Tipton County line:

Ap—0 to 11 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; very friable; mildly alkaline; abrupt, smooth boundary.

C1—11 to 26 inches, brown (10YR 5/3) fine sandy loam; weak, fine, granular structure; very friable; moderately alkaline; clear, smooth boundary.
C2—26 to 34 inches, brown (10YR 5/3) silt loam; few, medium, grayish-brown mottles; weak, fine, granular structure to massive; very friable; moderately alkaline; abrupt, smooth boundary.
C3—34 to 43 inches, grayish-brown (10YR 5/2) fine sandy loam; massive; moderately alkaline; abrupt, smooth boundary.
C4—43 to 60 inches, grayish-brown (10YR 5/2) fine sand; single grain; loose; moderately alkaline.

The texture of the surface layer includes silt loam and sandy loam. The thickness of the Ap horizon ranges from 7 to 14 inches. The texture of the upper part of the C horizon ranges from silt loam to sandy loam.

Robinsonville fine sandy loam (Rb).—This is a deep, well-drained soil that generally occurs as strips near the Mississippi River. The surface layer is dark grayish-brown fine sandy loam 8 to 12 inches thick. Below this is several feet of brown, very friable fine sandy loam. There are areas of this soil that have a surface layer of loam and a few areas that have a sandy substratum.

This soil is neutral to mildly alkaline in reaction, high in natural fertility, and high in content of phosphorus and potassium. It is easy to work and keep in good tilth. Roots, water, and air penetrate readily. The available water capacity is high. Plants generally have a good supply of moisture. The areas not protected by a levee are flooded every 5 to 10 years.

This soil is used mainly for row crops, such as soybeans, cotton, and corn. Because of the nearly level slopes and good internal drainage, it is easy to manage and can be row cropped every year. Small grains and all of the commonly grown crops and pasture plants are suitable. The large amounts of plant roots and stalks that are produced help to maintain the organic-matter content and to keep the soil in good tilth.

Flooding is a slight hazard. It occasionally delays planting in areas not protected by a levee, but it does not prevent the growing of crops.

The site is excellent for bottom-land hardwoods, such as oaks, sweetgum, cottonwood, and hackberry. Natural or existing stands consist mainly of cherrybark oak, hackberry, sweetgum, pecan, sycamore, and cottonwood. Plant competition is severe. Because of the high natural fertility and high available water capacity, weeding is needed to encourage reproduction of desirable species and to eliminate cull trees.

This soil is suited to many kinds of plants that furnish food and cover for wildlife. Wastes left in the harvesting of corn and soybeans contribute to the food suppy. Alfalfa, sericea lespedeza, and shrub lespedeza are among the many perennial plants that also provide food. The wooded areas furnish food and cover. Trees such as bottom-land oaks and sweet pecan are good sources of food for squirrels, wild turkey, and many other species of wildlife. (Capability unit I–1)

Robinsonville silt loam (Rn).—This is a deep, well-drained soil on the islands, on Ensley Bottoms, and on the bottoms north of Shelby Forest State Park. It occurs as tracts 10 to 200 acres in size. It has the profile described as typical for the series. The surface layer is dark grayish-brown, very friable silt loam 8 to 12 inches thick. Below this is brown to grayish-brown, very friable fine sandy loam, loam, or silt loam. Layers of fine sand are commonly in the lower part of the subsoil.

The Robinsonville silt loam in Ensley Bottoms has a darker colored surface layer than that in other places. There are a few small areas of silty clay loam and some of fine sandy loam.

This soil is high in natural fertility. It does not need lime. It is readily penetrated by roots, water, and air and is easy to work and to keep in good tilth. The available water capacity is very high. Plants generally have a good supply of moisture.

Most of this soil has been cleared and is used to grow soybeans, cotton, and corn. All the commonly grown crops and pasture plants are suitable. A row crop can be grown every year. Small grain and alfalfa also grow well.

Flooding every 5 to 10 years is the main limitation.

Only a small part of the acreage is woodland. Existing stands consist mainly of cherrybark oak, hackberry, pecan, sycamore, and cottonwood. Plant competition is severe. Weeding is needed to encourage reproduction of desirable species in natural stands and to insure survival of seedlings in new plantings.

Many plants that furnish food and cover for wildlife grow well on this soil. Wastes left in harvest of summer annual crops, such as soybeans, corn, and grain sorghum, furnish some food. Among the many suitable perennial plants are sericea lespedeza and shrub lespedeza. Seeds of weeds, annual lespedeza, and other native plants that grow along field borders and ditches furnish some food and cover. Most of the cover now available is in nearby wooded areas and along field borders. (Capability unit I-1)

Sharkey Series

This series consists of dark-colored, poorly drained, clayey soils in low, narrow flats on the Mississippi River bottoms. These soils are commonly nearly neutral in reaction.

Representative profile of Sharkey clay, 1½ miles south of the Memphis Steam Plant:

Ap—0 to 6 inches, very dark grayish-brown (10YR 3/2) clay; moderate, fine, granular structure; firm when moist, plastic and sticky when wet; neutral; clear, smooth boundary.
C1g—6 to 28 inches, dark-gray (10YR 4/1) clay; many, medium, very dark grayish-brown and yellowish-brown mottles; massive; very plastic and sticky when wet; neutral; gradual, smooth boundary.
C2g—28 to 60 inches, gray (10YR 5/1) clay; many, medium, dark grayish-brown and brown mottles; massive; plastic and sticky when wet; neutral.

The thickness of the clayey sediment in which Sharkey soils formed ranges from about 3 to 6 feet. The clay content of that section ranges from about 45 to 65 percent. The color of the Ap horizon ranges from very dark grayish brown to dark grayish brown. Reaction ranges from neutral to mildly alkaline in each horizon.

Sharkey clay (Sh).—This is a dark-gray, poorly drained, level soil in narrow depressions on the Mississippi River bottoms. The topmost 4 to 6 inches is nearly black clay that is very sticky when wet and very hard when dry. Below this is dark-gray and gray, very sticky clay that extends to a depth of 3 to 6 feet.

This soil is high in natural fertility. It is nearly neutral in reaction and does not need lime. The available water capacity is medium. Because of the clayey texture, the soil is difficult to work and to keep in good tilth. It swells when wet and shrinks when dry, forming a network of cracks. The cracks are about 1 inch wide and extend down about 12 inches or more through the clay layer. The soil is flooded every 3 or 4 years during winter and spring; some areas are flooded every winter.

Annual crops and crops that tolerate wetness in winter and spring can be grown on Sharkey clay. Among the suitable crops are soybeans, grain sorghum, white clover, tall fescue, and annual lespedeza. Cotton and alfalfa can be grown on the few higher sites, but alfalfa stands are killed by the floods that cover this soil every few years. Because of the clayey plow layer and late planting dates, corn is only fairly well suited.

Floods, standing water, and the sticky, clayey plow layer cause management problems. Drainage ditches remove surface water satisfactorily during most of the growing season, but little can be done to prevent floods during winter and spring. Because of the clayey texture, tile drainage is not effective, and tillage and preparation of a seedbed are difficult. Most farmers prefer to plow late in fall or early in spring, when the soil is moist or even slightly wet. Freezing weather and rain break down the large clods and, at planting time, a fairly smooth seedbed can be prepared by harrowing. Since erosion is not a problem, a row crop, such as soybeans, can be grown every year. Plowing under stalks and stubble helps to maintain the organic-matter content and to improve tilth.

A large part of the acreage is woodland. The site is good for high-quality bottom-land hardwoods. Existing stands consist of bottom-land oaks, hackberry, sweetgum, sycamore, black willow, and cottonwood. Some cypress grows in the wetter spots. Because of excess water and the clayey texture, the rate of seedling mortality is moderate. Some areas are under water for as long as 2 weeks in winter and spring, and the standing water kills some seedlings, especially seedlings of Nuttall oak. Plant competition is severe. Weeds, vines, and briers grow abundantly in new plantings and in openings in existing stands. Plantings of cottonwood and sweetgum need to be cultivated during the first year. Because of flooding, a high water table, and the slick, plastic nature of the soil, use of logging equipment is generally limited to the dry summer months.

This soil can produce an abundant growth of several plants that furnish food and cover for wildlife. Among the suitable plants are soybeans, lespedeza, grain sorghum, and other summer annuals. Crop wastes left in harvest add to the supply of food for wildlife. In the wooded areas, bottom-land hardwoods provide food and cover for squirrels, wild turkey, raccoon, and deer. The canebrakes in the open spots in the woods provide refuge and a cool place for deer to bed down during the hot summer months. During the winter months, flooding and standing water cause the deer to migrate to higher ground but attract waterfowl. Some wooded areas can be managed for both waterfowl and wood products. (Capability unit IIIw–3)

Swamp (Sw).—This mapping unit is in depressions that hold 1 to 4 feet of standing water most of the year. Ordinarily these areas are wet and soggy but not ponded late in summer and fall, but in some years they hold water the year round. Swamp occurs as large tracts on bottom lands along the Mississippi River. The soil material is dark-gray and nearly black clay.

Swamp is not suitable for crops or pasture. Flooding and standing water are the main limitations. Little can be done to prevent flooding or to remove standing water.

Nearly all of the acreage is woodland. Only water-tolerant trees are suitable. Cypress is predominant. Seedling mortality is severe. The limitations on the use of equipment are severe; in most areas logging equipment can be used only late in summer and early in fall. Estimating production is not feasible.

Food for waterfowl can be grown in the areas that are not ponded in summer. Some areas could be developed for waterfowl hunting. (Capability unit VIIw–1)

Tunica Series

Tunica soils are somewhat poorly drained. They occur in low, broad flats on the Mississippi River bottoms and consist of 20 to 36 inches of dark-gray to very dark grayish-brown silty clay and clay underlain by loamy material.

Representative profile of Tunica silty clay, on Ensley Bottoms, 2 miles south of the Memphis Steam Plant:

Ap—0 to 6 inches, very dark grayish-brown (10YR 3/2) silty clay; moderate, fine, granular structure; firm when moist, plastic and sticky when wet; neutral.

A1—6 to 13 inches, dark-gray (10YR 4/1) to very dark grayish-brown (10YR 3/2) silty clay; few, medium, dark-brown and dark grayish-brown mottles; moderate, fine, granular structure; firm when moist, plastic and sticky when wet; mildly alkaline.

C1g—13 to 32 inches, dark-gray (10YR 4/1) clay; common, medium, dark grayish-brown and dark-brown mottles; firm; mildly alkaline.

C2g—32 to 35 inches, grayish-brown (10YR 5/2) silty clay loam; many, medium, dark grayish-brown and dark yellowish-brown mottles; massive; firm; mildly alkaline.

IIC3g—35 to 50 inches, grayish-brown (10YR 5/2) silt loam; common, medium, dark grayish-brown and dark yellowish-brown mottles; massive; friable; mildly alkaline.

The soil material below a depth of 20 to 36 inches is commonly loamy, but it ranges from silt loam to sand in texture. Reaction ranges from neutral to mildly alkaline in each horizon.

Tunica silty clay (Tu).—This is a somewhat poorly drained, neutral or mildly alkaline soil on the Mississippi River bottoms. It occurs as broad, flat tracts 20 to 500 acres in size. It consists of 4 to 8 inches of nearly black silty clay over dark-gray clay. Below a depth of 20 to 36 inches is loamy soil.

This soil is wet during winter and spring, and some tracts are flooded every 3 or 4 years for a period of 2 or 3 weeks, but the water generally drains away in time for crops to be planted. Only a small acreage is protected by a levee. Because of the clayey texture, this soil is difficult to work except when the moisture content is nearly optimum. When wet, the soil is sticky and plastic; when dry, it is hard and cloddy. It swells when wet and shrinks when dry. When it shrinks, a network of cracks forms. The cracks are about 1 inch wide and extend down

through the clay layer. The clay restricts the development of roots and the movement of water and air.

Tunica silty clay is high in natural fertility. It does not need lime, since the reaction is neutral. The available water capacity is medium or high.

Floods, standing water, and the sticky, clayey plow layer cause management problems. Drainage ditches remove surface water satisfactorily during most of the growing season, but little can be done to prevent floods during winter and spring. Some farmers prefer to plow late in fall or early in spring, when the soil is moist or even wet. Freezing weather and rain break down the large clods and, at planting time, a smooth seedbed can be prepared by harrowing. Since erosion is not a problem, a row crop, such as soybeans, can be grown every year.

A large part of the acreage is woodland. Some woodland tracts are as much as 400 acres in size. The site is good to excellent for high-quality bottom-land hardwoods. Existing stands consist mainly of bottom-land oaks, hackberry, sweetgum, sycamore, black willow, and cottonwood. Some cypress grows in the wetter spots. Because of excess water and clayey texture, the rate of seedling mortality is moderate. Standing water can be expected to kill some seedlings, especially seedlings of Nuttall oak. Plant competition is severe because of the high natural fertility. Weeds, vines, and briers grow abundantly in new plantings and in openings in existing stands. Plantings of cottonwood and sweetgum need to be cultivated during the first year. Because of flooding, a high water table, and the slick, plastic nature of the soil, use of logging equipment is generally limited to the dry summer months.

This soil can produce an abundant growth of many plants that furnish food and cover for wildlife. Among these plants are soybeans, lespedeza, grain sorghum, and other summer annuals. Crop wastes left in harvest of soybeans add to the food supply. In the wooded areas, bottom-land hardwoods furnish food and cover for squirrels, wild turkey, and deer. The canebrakes in the open spots in the woods provide refuge and a cool place for deer to bed down during the hot summer months. The flooding and standing water attract waterfowl in winter. By seeding suitable plants and then flooding, areas 3 acres or more in size can be developed as feeding areas for wild ducks. The water must be controlled, however, so that the fields will be dry enough in summer to be planted. (Capability unit IIIw–3)

Waverly Series

This series consists of poorly drained, level, silty soils on low, broad first bottoms. These soils formed in medium acid and strongly acid loess that washed from uplands.

Representative profile of Waverly silt loam, 200 yards south of the Loosahatchie River and 175 yards west of Brunswick Road:

Ap—0 to 8 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; very friable; strongly acid; abrupt, smooth boundary.

C1g—8 to 20 inches, gray (10YR 5/1) silt loam; common, medium, grayish-brown and yellowish-brown mottles; weak, fine, granular structure; friable; strongly acid; gradual, smooth boundary.

C2g—20 to 36 inches, gray (10YR 6/1) silt loam; common, medium, faint, grayish-brown and yellowish-brown mottles; massive; friable; few soft iron concretions; strongly acid; gradual, smooth boundary.

C3g—36 to 60 inches, grayish-brown (10YR 5/2) silt loam; many, medium, gray and brown mottles; massive; friable; strongly acid.

The color of the surface layer ranges from dark gray to brown.

Waverly silt loam (Wv).—This is a poorly drained, level soil on broad first bottoms along the small rivers and creeks. It occurs as tracts 10 to 500 acres in size. The surface layer is dark grayish-brown silt loam 3 to 8 inches thick. The underlying material is gray or mottled gray and brown silt loam.

There are some areas along Big Creek in the northern part of the county that have a layer of dark-gray, neutral heavy silt loam below a depth of 36 inches. In these areas the soil is usually darker colored throughout the profile.

This soil is flooded nearly every year. In winter and spring, the water table is seldom more than a foot below the surface, and water stands in low spots (fig. 13). The excess water does not drain away until rather late in spring.

After it dries out, this soil is easy to work and is readily penetrated by roots, water, and air. The available water capacity is high. Plants have a good supply of moisture throughout the summer. The reaction is medium acid or strongly acid. The natural fertility is moderate. Generally, the content of potassium is low and the content of phosphorus medium. The response to lime and fertilizer is good.

About half the acreage has been cleared and is used to grow soybeans, cotton, corn, and pasture. Summer annual crops that can be planted late and pasture plants that tolerate wetness in winter and spring are well suited. Cotton and corn are fairly well suited. They occasionally have to be planted late because the soils warm up slowly in spring. During much of winter and spring, the soil is generally too wet and too soft for grazing.

Wetness in winter and spring is the major limitation. It can be overcome partly by selecting crops that grow in summer or that tolerate wetness in winter and partly by using drainage ditches to remove some of the excess water. Little can be done to lower the seasonal high water table or to control flooding.

If adequate surface drainage is provided, a row crop can be grown every year. Plowing under the stalks and stubble of adequately fertilized crops helps to maintain the organic-matter content and to improve tilth.

More than half of the acreage is woodland. Some of the large wooded tracts are in the wettest areas. The site is good for bottom-land oaks, red maple, cottonwood, sweetgum, green ash, and sycamore. Existing stands consist mainly of these trees. Seedling mortality is moderate. Floods during spring are the main cause of loss of seedlings. Plant competition is severe. Vines, briers, and bushes grow abundantly in abandoned fields and in openings in tree stands. Flooding and a high water table are moderate limitations on the use of equipment.

Seasonal wetness limits the choice of plants that can be grown for wildlife. Summer annual crops that do not require a long growing season are suitable, and if the soil is adequately drained, all of the commonly grown

Figure 13.—Standing water in low spots on Waverly silt loam. Drainage ditches and land grading or smoothing would hasten removal of excess water.

summer annual crops can be grown. Wastes left in the harvesting of such crops as soybeans furnish some food for wildlife. By seeding suitable food plants and then flooding the areas during fall and winter, areas more than 3 acres in size can be developed for feeding wild ducks. The water must be drained off in spring so that the fields will be dry enough in summer to be planted again. The wooded areas furnish food and cover for wildlife, including waterfowl. (Capability unit IIIw–1)

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 reclamation projects; and does not apply to rice, cranberries, 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 for engineering.

In the capability system, all kinds of soils are grouped at three levels: the capability class, the subclass, and the unit. These are discussed 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, range, woodland, or wildlife. (None of the soils in Shelby County have been placed in class V.)

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.

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.

Class VIII soils and landforms have limitations that preclude their use for commercial plants and restrict their use to recreation, wildlife, or water supply, or to esthetic purposes. (None of the soils in Shelby County have been placed in class VIII.)

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 IVs–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 paragraphs; and the Arabic numeral specifically identifies the capability unit within each subclass.

The capability units in Shelby County are as follows:

Unit I–1. Well-drained, nearly level, loamy and silty soils.

Unit I–2. Moderately well drained, nearly level, silty soils on bottom lands.

Unit IIe–1. Deep, well drained and moderately well drained, gently sloping, silty soils.

Unit IIe–2. Moderately well drained, gently sloping, silty soils that have a fragipan at a depth of about 2 feet.

Unit IIw–1. Somewhat poorly drained, nearly level soils that have a silty or clayey surface layer and a silty or loamy subsoil.

Unit IIw–2. Moderately well drained, nearly level soils that have a fragipan at a depth of about 24 inches.

Unit IIIe–1. Deep, well drained and moderately well drained, gently sloping or sloping, silty soils.

Unit IIIe–2. Moderately well drained, gently sloping or sloping, silty soils that have a fragipan at a depth of about 2 feet.

Unit IIIw–1. Poorly drained, nearly level, silty soils.

Unit IIIw–2. Somewhat poorly drained, level to gently sloping soils that have a fragipan.

Unit IIIw–3. Poorly drained, level to slightly depressed, clayey soils.

Unit IVe–1. Well drained and moderately well drained, strongly sloping, silty soils.

Unit IVe–2. Moderately well drained, sloping to strongly sloping, silty soils that have a fragipan at a depth of about 20 inches.

Unit IVw–1. Poorly drained, level, alkaline soils.

Unit IVs–1. Very sandy, nearly level, excessively drained soils.

Unit VIe–1. Deep, well drained and moderately well drained, sloping to steep, silty soils.

Unit VIe–2. Moderately well drained, sloping to strongly sloping, silty soils that have a fragipan near the surface.

Unit VIe–3. Land that consists of a long, steep-sided levee and a borrow area alongside it.

Unit VIIe–1. Very steep, silty soils.

Unit VIIe–2. Strongly sloping to steep, silty soils that have many shallow to deep gullies.

Unit VIIw–1. Swamps. Water is on or near the surface nearly all year.

To find the capability classification of any given soil, refer to the Guide to Mapping Units or to the soil descriptions, pages 10 to 36. Use and management of each soil are discussed in the soil description.

Estimated Yields

Table 3 gives estimates of average acre yields of the main crops grown in the county. It gives estimates for each soil under two levels of management. The figures in columns A are based on management that is common in Shelby County. Those in columns B are based on improved management.

The figures in table 3 represent averages for the 10-year period that ended in 1965. They are based on data obtained through experiments and on information from farmers and agricultural workers who have had experience with crops and soils in Shelby County.

The following general practices, which are applicable whatever crop is grown, are part of the management system under which the yields in columns B can be expected.

1. Selection of crops and cropping systems suited to the soil.
2. Application of fertilizer and lime in accordance with needs indicated by chemical tests and by past cropping and fertilizing practices.
3. Adequate seedbed preparation.
4. Use of crop varieties that are high yielding and suited to the area.

TABLE 3.—*Estimated average acre yields of principal crops under two levels of management*

[Estimates are based on average rainfall over a long period of time, without irrigation. Columns A represent common management; columns B, improved management. Absence of figure indicates the soil is not arable or the crop is not suited to the soil or is not commonly grown on it]

Soil	Cotton (lint)		Corn		Soybeans		Alfalfa		Wheat		Lespedeza (seeded alone)		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
	Lb.	*Lb.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Adler silt loam	625	800	65	100	25	40	2. 0	3. 3	25	40	1. 3	2. 0	130	200
Bonn silt loam	275	450	40	55	10	20					. 9	1. 3	95	140
Bowdre silty clay	400	625	40	60	24	32	2. 0	3. 0	20	30	1. 0	1. 4	95	140
Calloway silt loam	300	575	35	65	20	32			20	30	. 7	1. 2	65	150
Collins silt loam	625	800	60	100	25	40	1. 9	3. 0	20	40	1. 3	2. 0	130	200
Commerce silt loam	450	750	55	90	25	36	2. 0	3. 0	20	32	1. 2	1. 7	125	195
Convent silt loam	500	700	55	90	20	35			18	25	1. 2	1. 9	115	180
Crevasse fine sand													35	45
Crevasse silt loam							1. 0	1. 5	15	25	. 5	. 6	35	45
Falaya silt loam	500	700	55	80	20	35			17	25	1. 2	1. 9	115	180
Filled land, silty														
Filled land, sandy														
Grenada silt loam, 0 to 2 percent slopes	450	650	50	75	24	35	1. 7	2. 2	20	35	1. 1	1. 7	95	170
Grenada silt loam, 2 to 5 percent slopes	450	650	50	75	24	35	1. 7	2. 2	20	35	1. 1	1. 7	95	170
Grenada silt loam, 2 to 5 percent slopes, eroded	300	500	40	60	15	25	1. 1	1. 5	18	30	. 7	1. 0	95	150
Grenada silt loam, 5 to 8 percent slopes	300	575	22	65	15	28	1. 5	2. 1	17	28	. 7	1. 2	95	160
Grenada silt loam, 5 to 8 percent slopes, severely eroded	250	450	25	45	10	20			16	24	. 5	. 8	80	140
Grenada silt loam, 8 to 12 percent slopes	250	425	22	50	10	22	1. 3	1. 9	16	26	. 3	1. 2	70	120
Grenada silt loam, 8 to 12 percent slopes, eroded							1. 3	1. 7	15	25	. 2	. 5	60	95
Grenada complex, 5 to 12 percent slopes, severely eroded									15	24	. 5	. 7	45	90
Graded land, silty materials														
Gullied land, silty														
Henry silt loam	250	425	25	50	20	35					. 6	1. 2	105	150
Iberia silt loam	375	500	40	55	25	35					1. 0	1. 4	90	140
Levees and Borrow Pits														
Loring silt loam, 2 to 5 percent slopes	500	750	55	80	25	36	2. 2	3. 2	25	40	1. 1	1. 6	130	180
Loring silt loam, 2 to 5 percent slopes, eroded	450	650	40	70	20	30	2. 0	2. 9	25	37	. 9	1. 3	100	165
Loring silt loam, 5 to 8 percent slopes, eroded	350	525	40	60	15	25	1. 9	2. 6	22	33	. 7	1. 0	100	160
Loring silt loam, 8 to 12 percent slopes	300	500	30	50	15	22	1. 7	2. 6	18	28	. 8	1. 2	75	125
Loring silt loam, 8 to 12 percent slopes, eroded	275	450	25	45	10	20	1. 1	2. 0	17	26	. 6	1. 0	60	120
Loring silt loam, 5 to 12 percent slopes, severely eroded							1. 7	2. 0	19	26	. 6	1. 0	60	90
Memphis silt loam, 2 to 5 percent slopes	525	750	55	85	21	35	2. 5	3. 5	25	40	1. 1	1. 8	130	180
Memphis silt loam, 2 to 5 percent slopes, eroded	475	650	45	70	20	32	2. 5	3. 0	25	37	. 9	1. 3	100	165
Memphis silt loam, 5 to 8 percent slopes, eroded	450	600	40	65	15	30	2. 0	3. 0	22	35	1. 0	1. 3	100	160
Memphis silt loam, 8 to 12 percent slopes, eroded	275	500	30	55	14	20	1. 9	2. 8	16	32	. 6	1. 0	80	125
Memphis silt loam, 5 to 12 percent slopes, severely eroded							1. 9	2. 3	17	30	. 6	1. 0	60	95
Memphis silt loam, 12 to 20 percent slopes											. 7	1. 0	75	125
Memphis silt loam, 12 to 30 percent slopes, severely eroded													60	95
Memphis silt loam, 30 to 65 percent slopes														

See footnote at end of table.

TABLE 3.—*Estimated average acre yields of principal crops under two levels of management*—Continued

Soil	Cotton (lint)		Corn		Soybeans		Alfalfa		Wheat		Lespedeza (seeded alone)		Pasture	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
	Lb.	*Lb.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
Robinsonville fine sandy loam	675	800	75	90	25	40	2. 5	3. 5	25	40	1. 3	1. 9	145	180
Robinsonville silt loam	675	800	75	100	25	40	2. 5	3. 5	25	40	1. 3	1. 9	145	180
Sharkey clay	375	500	40	55	25	35	------	------	------	------	. 8	1. 2	85	120
Swamp	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Tunica silty clay	375	575	40	55	27	35	2. 3	3. 0	------	------	1. 0	1. 4	95	140
Waverly silt loam	400	550	40	60	23	34	------	------	------	------	. 8	1. 4	90	130

[1] Cow-acre-days 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 days the pasture can be grazed during a year without injury to the sod. An acre of pasture that provides 30 days of grazing for two cows has a carrying capacity of 60 cow-acre-days.

5. Planting or seeding by suitable methods at the proper rate, and at the right time.
6. Inoculation of legumes.
7. Shallow cultivation of row crops.
8. Control of weeds, insects, and diseases.
9. Adequate surface drainage.
10. Suitable harvesting methods.

The following specific practices for each of the crops listed in table 3 are also part of the management system.

Cotton. Practices on which estimates in columns B are based are—

1. Spacing rows about 38 to 40 inches apart. Thinning the number of plants to between 20,000 and 60,000 per acre, without skips.
2. Applying about 70 pounds of nitrogen per acre.

Soils that yield less than about one bale per acre under good management are poorly suited to cotton and can be used to better advantage for other crops.

Corn. Three sets of practices are given for three different levels of estimated productivity.

Soils that yield 80 bushels or more per acre are excellent soils for corn. Practices upon which estimates are based are—

1. Planting for a stand of about 16,000 plants per acre.
2. Applying about 120 pounds of nitrogen per acre.

Soils that yield 60 to 80 bushels per acre are good soils for corn. Practices upon which estimates are based are—

1. Planting for a stand of about 12,000 plants per acre.
2. Applying 90 pounds of nitrogen per acre.

Soils that yield 40 to 60 bushels per acre are fair soils for corn. Practices upon which estimates are based are—

1. Planting for a stand of about 8,000 plants per acre.
2. Applying about 60 pounds of nitrogen per acre.

Soils that have an estimated potential of less than 40 bushels per acre under good management are poorly suited to corn and can be used more profitably for other crops.

Soybeans. No specific management practices are assumed.

Alfalfa. Management practices on which estimates are based are—

1. Applying up to 15 pounds of nitrogen and 20 pounds of borax at seeding time. Applying annually, after the first year, 20 pounds of borax, and the amounts of phosphate and potash indicated by soil tests.
2. Controlling grazing and cutting hay at the proper time and to the right stubble height. No cutting of hay from about September 10 to the date of the first killing frost.

Wheat. Management practices on which the estimates for wheat are based are—

1. Applying 20 to 30 pounds of nitrogen at seeding time in fall and 30 pounds per acre as a topdressing in spring.

Engineering Uses of the Soils [4]

Some soil properties are of special interest to engineers because they affect the construction and maintenance of roads, airports, pipelines, building foundations, water storage facilities, erosion control structures, drainage systems, and sewage disposal systems. Among these properties are permeability, compaction characteristics, drainage, shrink-swell characteristics, grain size, plasticity, and reaction (pH). Also important are depth to the water table, depth to bedrock, flood hazard, and topography. Tables 4, 5, and 6 provide soils data useful in engineering. The information was developed by soil

[4] WILLIAM J. CARMACK, soil mechanics engineer, Soil Conservation Service, assisted with the preparation of this section.

scientists and engineers working together. It can be used to—

1. Make studies that will aid in selecting and developing industrial, business, residential, and recreational sites.
2. Make preliminary estimates of the engineering properties of soils for use in the planning of agricultural drainage structures, farm ponds, and irrigation systems.
3. Make preliminary evaluations that will aid in selecting locations for highways and airports and in planning detailed investigations of the selected locations.
4. Locate probable sources of sand and gravel and other construction materials.
5. Correlate performance of engineering structures with soil mapping units and thus develop information that will be useful in designing and maintaining new structures.
6. Determine the suitability of soil units for cross-country movement of vehicles and construction equipment.
7. Supplement information obtained from other published maps and reports and aerial photographs for the purpose of making maps and reports that engineers can use readily.
8. Make other preliminary estimates for construction purposes pertinent to areas for which laboratory data are not available.

With the use of the soil map for identification, the engineering interpretations reported here can be useful for many purposes. It should be emphasized, however, that they 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 of layers here reported. Even in these situations, the soil map is useful in planning more detailed field investigations and for suggesting the kinds of problems that may be expected.

Some terms used by soil scientists may be unfamiliar to engineers. Other terms, for example, *soil*, *clay*, *silt*, *sand*, *topsoil*, and *aggregate*, have special meanings in soil science. These terms and others are defined in the Glossary at the back of this soil survey.

Engineering classification of the soils

Two systems of classifying soils for engineering purposes are used in this soil survey, the AASHO system and the Unified system. Most highway engineers classify soils in accordance with the system approved by the American Association of State Highway Officials (AASHO) (*1*). In this system soils are placed in seven principal groups. The groups range from A-1, which consists of gravelly soils of high bearing capacity, to A-7, which consists of clayey soils that have low 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 symbol, for example, A-4 (*1*). Index numbers are not given for the soils in Shelby County, because they cannot be determined accurately without laboratory measurements. No laboratory data are available for soil samples taken inside Shelby County, though data are available for similar soils in adjacent and nearby counties.

Some engineers prefer the Unified soil classification system (*8*), which was developed by the Waterways Experiment Station, Corps of Engineers. In this system soil materials are identified as coarse grained (eight classes), fine grained (six classes), or highly organic (one class).

Both the AASHO and the Unified systems classify soil material according to particle-size gradation and plasticity characteristics. The classifications permit engineers to make rapid appraisals of soils.

Table 4 gives the estimated classifications of the soils in Shelby County according to both the AASHO and the Unified systems. The estimates are based on laboratory data for similar soils in adjacent and nearby counties.

Estimated engineering properties

Table 4 gives estimates of some of the soil characteristics significant in engineering and the engineering classification of the principal horizons of each soil.

Permeability is estimated for uncompacted soil material. The estimates are based on structure, consistence, field observations, and some laboratory data.

The available water capacity, measured in inches per inch of soil, is an approximation of the amount of capillary water in a soil that is wet to field capacity. It is the approximate amount of water held in the soil between ⅓ atmosphere and 15 atmospheres of tension. If the soil is at permanent wilting point, this amount of water will wet it to a depth of 1 inch. The estimates are based on texture and laboratory data.

The pH value refers to the condition of the soils before liming.

The shrink-swell potential is an indication of the volume change to be expected with a change in moisture content. It is estimated primarily on the basis of the amount and type of clay in the soil material.

The frequency of flooding is not given in this section. This information, if applicable, is given in the section "Descriptions of the Soils." If it is not mentioned, it may be assumed that the soil is not subject to flooding. The depth at which bedrock occurs is not given, because in this county bedrock is so far below the surface that it presents no problem in engineering.

Engineering interpretations

Table 5 lists, for each soil series, suitability ratings for specific purposes and soil features that affect highway construction and soil- and water-conservation engineering.

The ratings of the soils as sources of topsoil are for the uppermost 12 inches of the soil profile, because normally only the surface layer is removed for use as topsoil. Nevertheless, a few of the soils are suitable sources of topsoil to a depth of 3 feet or more. These are Adler, Collins, Commerce, Loring, Memphis, and Robinsonville soils. Topsoil of good quality is plentiful in Shelby County. Soils that have a high content of clay and those that have a high content of sand are rated poor.

The suitability of a soil material for road fill depends mainly on texture and natural water content. Generally, the most desirable material is coarse textured and easily drained. Highly plastic soil material is poor or fair, depending on its natural water content and the ease with which it can be handled, dried, and compacted. A highly erodible soil, for example, one composed primarily of fine sand and silt, should be used only on gentle slopes, and vegetation must be established quickly; otherwise, a network of gullies will form. A silty soil requires close control of moisture during compaction.

Sand suitable for concrete and masonry work underlies the Falaya and Collins soils near the mouth of the Wolf River. Sandbars in the Mississippi River offer an abundance of poorly graded sand. Other sources of sand include the Crevasse soils and the subsoil of Bowdre and Robinsonville soils in some places. Some of the gravel pits are sources of sand.

Gravel of the Coastal Plain, which is buried with 10 to 30 feet of loess in this county, is fairly plentiful. It can be used economically for secondary roads, and it is suitable for base course, subgrade, and road fill.

Features unfavorable for highway location include instability of the soil material (highly plastic clay or highly erodible material), seepage, a high water table, and flooding. Many soils in Shelby County either are flooded or have a seasonal high water table. Highways on those soils must have an embankment high enough to keep the roadway above high water. Some soils have seepage above a fragipan. Seepage can cause slumping or sliding.

Farm ponds are an important source of water in Shelby County, especially in the eastern two-thirds of the county, where permanent streams are few. Most of the soils are suitable for reservoir sites. A few have layers of sand that should be mixed with clayey material and compacted. Most of the soils on the Mississippi River flood plain are likely to contain layers of sand. The deep loess in the uplands is good material for reservoirs, but it is not so good for embankments, because it has low strength and stability and is highly erodible.

Many of the soils in Shelby County are poorly drained. Some can easily be drained artificially; others are difficult to drain. The permeable soils on the bottom lands, such as Convent, Falaya, and Waverly soils, can be drained by tile or open ditches if suitable outlets are available. The poorly drained clay soils and the soils that have a fragipan can be drained by open ditches. Tile drains do not work well in such soils, because of slow permeability.

Nonfarm uses of the soils

The population of Shelby County has more than doubled since 1930. In 1960 the population was more than half a million, and planners predict it will reach 1,000,000 by 1980. As the population expands, all uses of the soil become more competitive. Good soils are lost to agriculture as a result of urban growth and expansion of public facilities, such as highways, airports, and parks. Sound planning is needed to prevent costly mistakes in the shift in land use from agriculture to housing, recreation, and the like.

There are large areas in Shelby County that are suitable for many nonfarm uses. There are other large areas that could be developed only at high cost and with high risk of failure because of unfavorable soil properties, such as wetness, steep slopes, and poor stability. The use of the soil maps and the interpretations in this publication can greatly decrease the chance of using soils for purposes to which they are ill suited.

Table 6, beginning on page 48, gives the soil-related limitations of the soils for selected nonfarm uses. The degrees of limitations are defined as follows:

Slight—Few or no limitations for use, or slight limitations that are easy to overcome.

Moderate—Limitations that can normally be overcome by good planning, careful design, and good management.

Severe—Limitations that are difficult and costly to overcome; costs may be prohibitive. Usage is generally unsound.

For dwelling houses with public sewer service, shrink-swell potential and depth to the water table are significant soil properties. Other factors considered are the hazard of flooding, seasonal wetness, and erodibility. If drainage is poor or flooding is frequent, other properties have little bearing on the ratings.

Dwelling houses with septic tank systems require well-drained soils that are not subject to flooding. Other factors considered are permeability, slope, and texture. Soils that have a high water table for long periods of time and soils that are frequently flooded are unsuitable. Soils that have slope gradients of more than 12 percent, such as some areas of Memphis silt loam, are rated as having severe limitations, even though other properties are favorable.

The limitations for light industrial and commercial buildings not more than three stories high would be of about the same degree as those for dwellings.

Playgrounds, athletic fields, and other intensive play areas require nearly level surfaces, good drainage, freedom from flooding during periods of use, texture and consistence that provide a firm surface, and potential for production of vegetation on all areas that are not paved or otherwise surfaced. Soil factors considered in making the ratings are slope, drainage, permeability, and texture of the soil. It is assumed that the sites are more than one acre in size and are to be used for providing facilities for organized games.

Picnic areas, parks, and other extensive use areas require nearly level to gently sloping soils, good drainage, freedom from flooding during periods of use, texture and consistence that provide a firm surface, and the ability to produce a varied vegetative cover. It is assumed that the sites are at least 3 to 5 acres in size.

Sites for golf course fairways need well-drained, firm, gently undulating soils that are free from flooding, have good trafficability, and are capable of supporting a good turf and many kinds of trees and shrubs. Soil factors considered in making the ratings are drainage, topography, productivity, texture, and slope.

Trafficways include residential streets and roads made with minimum cuts, fills, and subgrades. Soil factors important in making the ratings are slope, susceptibility to flooding, depth to seasonal high water table, erodibility, and traffic-supporting capacity.

TABLE 4.—*Estimated engineering*

Soil series and map symbols	Depth to seasonal high water table	Depth from surface	Classification
			USDA texture
	Ft.	*In.*	
Adler: Ad	1–2	0–50	Silt loam or silty clay loam
Bonn: Bo	0–1	0–10	Silt loam
		10–72	Silt loam or silty clay loam
Bowdre: Bw	1–2	0–14	Silty clay
		14–50	Silt loam to fine sandy loam
Calloway: Ca	0–1	0–18	Silt loam
		18–50	Silt loam
		50–60	Silt loam
Collins: Co	1–2	0–50	Silt loam
Commerce: Cr	1–2	0–48	Silt loam and silty clay loam
Convent: Cs	0–1	0–45	Silt loam
Crevasse:			
Cu	3–5	0–60	Fine sand
Cv	3–5	0–8	Silt loam
		8–60	Fine sand
Falaya: Fm	0–1	0–60	Silt loam
Filled land:			
Fs	4–10+	0–50	Silt loam
Fy	4–10+	0–50	Sand
Graded land, silty materials: Gr	4–10+	0–60	Silt loam
Grenada: GaA, GaB, GaB2, GaC, GaC3, GaD, GaD2, GgD3	1–2	0–22	Silt loam
		22–40	Silt loam
		40–60	Silt loam
Gullied land, silty: Gs	2–10+	0–48	Silt loam
Henry: He	0–1	0–20	Silt loam
		20–50	Silt loam
		50–90	Silt loam
Iberia: Ib	0–1	0–14	Silt loam
		14–60	Clay
Levees and Borrow Pits: Lb. No estimates of properties. Onsite study necessary.			
Loring: LoB, LoB2, LoC2, LoD, LoD2, LoD3	3–10+	0–60	Silt loam
Memphis: MeB, MeB2, MeC2, MeD2, MeD3, MeE, MeF3, MeG	10+	0–7	Silt loam
		7–18	Silty clay loam
		18–74	Silt loam
Robinsonville:			
Rb	3–10	0–48	Fine sandy loam
Rn	3–10	0–11	Silt loam
		11–43	Fine sandy loam or loam
Sharkey: Sh	0–1	0–60	Clay
Swamp: Sw. No estimates of properties. Onsite study necessary.			
Tunica: Tu	0–1	0–32	Silty clay and clay
		35–50	Silt loam to fine sandy loam
Waverly: Wv	0–1	0–60	Silt loam

properties of the soils

Classification—Continued		Percentage passing sieve—		Permeability	Available water capacity	Reaction	Shrink-swell potential
Unified	AASHO	No. 10	No. 200				
				In. per hr.	*In. per in. of soil*	*pH value*	
ML	A-4	100	95-100	0. 63-2. 0	0. 22	6. 6-7. 3	Low.
ML	A-4	100	90-100	0. 2-0. 63	. 22	6. 1-7. 3	Low.
ML or ML-CL	A-4	100	90-100	<0. 2	. 17	8. 0-9. 0	Low.
MH-CH	A-7	100	100	0. 2-0. 63	. 18	6. 6-7. 8	High.
CL or ML-CL	A-4	100	60-100	0. 63-2. 0	. 20	6. 6-7. 8	Low.
ML	A-4	100	95-100	0. 2-0. 63	. 22	5. 1-5. 5	Low.
ML-CL	A-6	95-100	90-100	<0. 2	. 17	5. 1-5. 5	Low.
ML-CL	A-4	95-100	95-100	0. 2-0. 63	. 22	5. 1-6. 5	Low.
ML	A-4	100	95-100	0. 63-2. 0	. 22	5. 1-5. 5	Low.
ML or CL	A-4	100	85-100	0. 63-2. 0	. 20	6. 6-7. 3	Low.
ML	A-4	100	90-100	0. 63-2. 0	. 20	6. 6-7. 3	Low.
SM or SP	A-2 or A-3	100	0-10	>6. 3	. 05	6. 6-7. 3	Low.
ML	A-4	100	75-100	0. 63-2. 0	. 20	6. 1-7. 3	Low.
SM or SP	A-2 or A-3	100	2-10	>6. 3	. 05	6. 1-7. 3	Low.
ML or ML-CL	A-4	100	90-100	0. 63-2. 0	. 20	5. 1-5. 5	Low.
ML or ML-CL	A-4	90-100	90-100	0. 63-2. 0	. 20	5. 1-6. 0	Low.
SM or SP	A-1 or A-2	65-100	0-15	>6. 3	. 05	5. 5-6. 5	Low.
ML or ML-CL	A-4	100	85-100	0. 63-2. 0	. 20	5. 1-6. 5	Low.
ML	A-4	100	90-100	0. 63-2. 0	. 22	5. 1-5. 5	Low.
ML-CL	A-4 or A-6	100	95-100	<0. 2	. 16	5. 1-5. 5	Low.
ML	A-4	100	95-100	0. 63-2. 0	. 22	5. 1-5. 5	Low.
ML or CL	A-4 or A-6	100	85-100	0. 63-2. 0	. 18	5. 1-5. 5	Low.
ML	A-4	100	95-100	0. 63-2. 0	. 22	5. 1-5. 5	Low.
ML-CL	A-4 or A-6	100	90-100	<0. 2	. 16	5. 1-5. 5	Low.
ML or ML-CL	A-4	100	90-100	0. 63-2. 0	. 20	5. 1-6. 0	Low.
ML or CL	A-4	100	90-100	0. 63-2. 0	. 20	6. 1-7. 8	Low.
CH	A-7	100	90-100	0. 2-0. 63	. 17	6. 1-7. 8	High.
ML-CL or ML	A-4 or A-6	100	95-100	0. 63-2. 0	. 20	5. 1-5. 5	Low.
ML	A-4	100	95-100	0. 63-2. 0	. 22	5. 1-5. 5	Low.
ML or ML-CL	A-6	100	95-100	0. 63-2. 0	. 20	5. 1-5. 5	Low.
ML or ML-CL	A-4 or A-6	100	95-100	0. 63-2. 0	. 22	5. 1-6. 5	Low.
ML	A-4	100	60-85	2. 0-6. 3	. 20	6. 6-7. 8	Low.
ML	A-4	100	85-100	0. 63-2. 0	. 22	6. 6-7. 8	Low.
ML	A-4	100	60-85	2. 0-6. 3	. 20	6. 6-7. 8	Low.
CH or MH-CH	A-7	100	100	<0. 2	. 16	6. 6-7. 8	High.
CH or MH-CH	A-7	100	95-100	0. 2-0. 63	. 17	6. 1-7. 8	High.
ML or CL	A-4 or A-6	100	60-100	0. 63-2. 0	. 19	6. 1-7. 8	Low.
ML-CL or ML	A-4	100	90-100	0. 63-2. 0	. 20	5. 1-5. 5	Low.

TABLE 5.—*Interpretations of*

Soil series and map symbols	Suitability as source of—		Soil features affecting—	
	Topsoil	Road fill	Highway location	Dikes or levees
Adler: Ad	Good	Poor	Flooding of some tracts.	High erodibility on slopes; compacts adequately only at optimum moisture content.
Bonn: Bo	Poor	Poor	High water table	High erodibility on slopes; poor stability.
Bowdre: Bw	Poor	Poor to depth of 10 to 20 inches; good below depth of 20 inches.	Highly plastic consistence in top 10 to 20 inches; flooding.	Good material below depth of 10 to 20 inches.
Calloway: Ca	Fair	Poor to fair	Perched water table	High erodibility on slopes; poor stability; compacts adequately only at optimum moisture content.
Collins: Co	Good	Poor to fair	Flooding	High erodibility on slopes
Commerce: Cr	Good	Fair to good	Flooding; seasonal high water table.	Intermittent wetness
Convent: Cs	Fair	Poor	Seasonal high water table.	High erodibility; poor stability.
Crevasse: Cu, Cv	Poor	Good	Flooding	Rapid permeability; high erodibility on slopes; good compaction.
Falaya: Fm	Fair	Poor to fair	Flooding; seasonal high water table.	High erodibility on slopes; compacts adequately only at optimum moisture content.
Filled land: Fs, Fy. No estimates of properties.				
Graded land, silty materials: Gr. No estimates of properties.				
Grenada: GaA, GaB, GaB2, GaC, GaC3, GaD, GaD2, GgD3.	Fair	Poor to fair	Seepage along surface of fragipan for short periods.	High erodibility; poor to fair stability.
Gullied land, silty: Gs. No estimates of properties.				
Henry: He	Poor	Poor	Seasonal high water table.	High erodibility; poor stability.
Iberia: Ib	Poor	Poor	Flooding	Subsoil is plastic clay
Levees and Borrow Pits: Lb. No estimates of properties.				
Loring: LoB, LoB2, LoC2, LoD, LoD2, LoD3.	Good	Poor to fair	Erodible in sloping cuts.	High erodibility on slopes; compacts adequately only at optimum moisture content.

engineering properties of the soils

Soil features affecting—Continued				
Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions
Reservoir area	Embankment			
Soil properties favorable.	High erodibility	Not needed	Soil properties favorable	Normally not needed, but soil properties favorable.
Soil properties favorable.	High erodibility	Slow permeability	Slow permeability	Not needed.
Strata of permeable material in subsoil.	Surface layer is plastic; good material below depth of 1 to 2 feet.	Surface drainage needed	Slow intake	Not needed.
Soil properties favorable.	High erodibility	Surface drainage needed; slow permeability in subsoil.	Slow permeability	Normally not needed, but soil properties favorable.
Soil properties favorable.	High erodibility	Not needed	Soil properties favorable	Not needed, but soil properties favorable.
Strata of permeable material may be below 3 feet.	Fair to good strength and stability.	Seasonal high water table; flooding.	Soil properties favorable	Not needed.
Soil properties favorable.	High erodibility	Seasonal high water table.	Soil properties favorable	Not needed.
Rapid permeability	Rapid permeability; high erodibility on slopes; good compaction.	Not needed	Low available water capacity; rapid intake.	Not needed.
Soil properties favorable.	High erodibility	Seasonal high water table; flooding.	Soil properties favorable	Not needed.
Soil properties favorable.	High erodibility	Not needed	Moderately deep root zone; slow permeability in subsoil.	Fragipan at depth of 12 to 24 inches; strong slopes on much of the acreage.
Soil properties favorable.	High erodibility	Seasonal high water table; slow permeability.	Moderately shallow root zone; slow permeability.	Not needed.
Soil properties favorable.	Highly plastic clay	Slow permeability in subsoil.	Fairly slow intake	Not needed.
Soil properties favorable.	High erodibility	Not needed	Soil properties favorable.	Strong slopes on much of the acreage.

TABLE 5.—*Interpretations of*

Soil series and map symbols	Suitability as source of—		Soil features affecting—	
	Topsoil	Road fill	Highway location	Dikes or levees
Memphis: MeB, MeB2, MeC2, MeD2, MeD3, MeE, MeF3, MeG.	Good	Poor to fair	Erodible in cuts	High erodibility on slopes; compacts adequately only at optimum moisture content.
Robinsonville: Rb, Rn	Good	Good	Flooding	Soil properties favorable
Sharkey: Sh	Poor	Poor	Flooding; high shrink-swell potential.	Plastic clay; high shrink-swell potential.
Swamp. Sw. No estimates of properties.				
Tunica: Tu	Poor	Poor	Flooding; high shrink-swell potential.	High shrink-swell potential.
Waverly: Wv	Poor	Poor	Flooding; seasonal high water table.	Poor stability; compacts adequately only at optimum moisture content.

Formation and Classification of the Soils

Soils differ from one another because of differences in the environments in which they formed. By studying the characteristics of an existing soil, one can reconstruct the process of its formation and can assemble data that provide a basis for its placement in the nationwide scheme of soil classification.

Formation of the Soils

Soils form as a result of the interaction of five major factors: parent material, climate, living organisms, relief, and time. All five affect the formation of every soil, but the importance of each varies from place to place. Sometimes one is more important, and sometimes another, and in some places the influence of each is about equal.

Parent material

Parent material is the unconsolidated mass from which a soil forms. It determines the limits of the chemical and mineralogical characteristics of soil. Loess and alluvium were the parent material of the soils in Shelby County.

Peorian loess is the parent material of the soils on the uplands. It overlies two older deposits of loess, the Farmdale and the Loveland. Each of these two deposits followed a period of glaciation, was followed by a period of soil formation, and then was covered by a new deposit of loess. In the western part of the uplands, where Memphis soils are the most common, the deposit of Peorian loess is approximately 80 feet thick. It becomes progressively thinner toward the east, and at the eastern edge of the county it is as little as 5 feet thick. Grenada and Loring soils are predominant in this part of the county.

Some of the alluvium in Shelby County washed from the local uplands and was deposited along upland drainageways, and some was deposited by the Mississippi River. The alluvium along the drainageways in the uplands washed from soils that formed in loess and so is silty. The Collins and Falaya soils formed in this kind of material.

The alluvium on the Mississippi River bottom lands has a wide range in texture. When the river overflows its banks and spreads out, the coarser soil particles are deposited nearest the river. This accounts for the slightly higher strips, known as natural levees, alongside the river channel. The soils on natural levees formed in sandy and silty material and are light colored, well drained, and permeable. Examples are soils of the Crevasse and Robinsonville series. As the floodwater continues to spread and moves more slowly, it drops medium-textured sediment, such as silt mixed with a small amount of clay and fine sand. Soils of the Commerce series formed in this kind of material. They are somewhat poorly drained. As the floodwater finally drains away, it leaves low depressions and old river channels filled with standing water. The clay and fine silt particles settle out of this muddy, still water, leaving clayey slack-water deposits. Soils formed in this kind of material, for example Sharkey and Tunica soils, are poorly and somewhat poorly drained and slowly permeable.

Climate

The warm, moist climate of Shelby County promotes rapid soil development. As a result of high rainfall, leaching is rather intense, and soluble and colloidal materials move downward in the soil. Plant remains decompose rapidly, and the organic acids thus produced hasten development of clay minerals and removal of

engineering properties of the soils—Continued

Soil features affecting—Continued				
Farm ponds		Agricultural drainage	Irrigation	Terraces and diversions
Reservoir area	Embankment			
Soil properties favorable.	High erodibility	Not needed	Soil properties favorable.	Strong slopes on much of the acreage.
Rapid permeability	Soil properties favorable.	Not needed	Soil properties favorable.	Not needed.
Soil properties favorable.	High shrink-swell potential; cracks when dry.	Slow permeability	Slow permeability	Not needed.
Permeable below a depth of 2 feet.	High shrink-swell potential; cracks when dry.	Moderately slow permeability.	Slow intake	Not needed.
Soil properties favorable.	High erodibility	Flooding; seasonal high water table.	Poor drainage; moderate root zone.	Not needed.

carbonates. Many of the soils have been leached of calcium carbonate and other bases and are now acid. Clay has been washed down from the upper 8 to 12 inches into the subsoil. Thus, the subsoil is the zone of highest content of clay. The leaching of soluble minerals and the accumulation of iron and other less soluble materials in the subsoil account for the fact that well-drained, well-aerated soils, such as Memphis and Loring, are slightly redder than their parent material. Soil development can continue almost the year round, because the soil is frozen for only short periods and then only to a shallow depth.

The climate is relatively uniform throughout the county, so climate alone does not account for the major differences among the local soils.

Living organisms

Plants, animals, insects, bacteria, fungi, and micro-organisms are important in the formation of soils. Among the changes they cause are gains in content of organic matter and nitrogen, gains or losses in content of plant nutrients, and changes in structure and porosity. Vegetation generally has a greater effect on soil formation than other living organisms.

The soils of this county formed under a dense stand of hardwoods. On the well-drained soils, the dominant trees were oak, hickory, and tulip-poplar. On the poorly drained soils, particularly those on the flood plains, there was a wider variety of trees, mainly water-tolerant oaks, sycamore, willow, gum, ash, and maple. The main differences in vegetation were probably the result of differences in drainage and aeration of the soil.

Fungi and micro-organisms also had a strong influence on soil formation. The activity of earthworms and other small animals affects mainly the uppermost few inches of the soil.

Relief

Relief, or lay of the land, is the cause of major differences among the soils on the uplands. Relief influences soil formation through its effect on drainage, erosion, and soil temperature. Also, it determines the kind of vegetation that will grow on the soils.

The deep, well-drained, well-aerated Loring and Memphis soils developed on hills and ridges, where excess water drains away readily. Early settlers found oak, hickory, black walnut, and yellow-poplar trees in these areas.

The gray, poorly drained, poorly aerated Henry soils developed in low, level areas from which water drains away slowly. The parent material was waterlogged much of the time; thus, air was prevented from entering and oxidizing the soils, or turning them brown. The absence of air resulted in the reduction of iron in the soils, a process called gleying. The places where these soils occur are called "white land" or "buckshot land," because the soils are light gray in color and contain many concretions.

Where relief and position are intermediate, Grenada and Calloway soils have formed. In drainage and aeration these soils are intermediate between the Henry soils and the Memphis soils.

Soils that have a fragipan cover a large part of the county. A fragipan consists of silt loam or silty clay loam and ranges from weakly developed, as in Loring soils, to very firm, dense, and well developed, as in Calloway and Grenada soils. The soils in which a fragipan has formed range from level to steep.

Even among the bottom-land soils, which are young and show slight evidence of soil formation, differences in relief have caused some important differences. In the higher and better drained areas of bottom land, the

TABLE 6.—*Soil limitations*

Soil series and map symbols	Degree of limitation for—		
	Dwelling houses with public sewer service	Dwelling houses with septic tank systems	Playgrounds, athletic fields, and other intensive play areas
Adler: Ad	Severe	Severe	Severe
Bonn: Bo	Severe	Severe	Severe
Bowdre: Bw	Severe	Severe	Severe
Calloway: Ca	Moderate	Severe	Severe
Collins: Co	Severe	Severe	Severe
Commerce: Cr	Severe	Severe	Severe
Convent: Cs	Severe	Severe	Severe
Crevasse: Cu, Cv	Severe	Severe	Severe
Falaya: Fm	Severe	Severe	Severe
Filled land:			
Fs	Moderate	Moderate	Moderate
Fy	Moderate	Severe	Severe
Graded land, silty materials: Gr	Slight	Slight	Slight
Grenada:			
GaA, GaB, GaB2	Slight	Severe	Slight
GaC, GaC3, GaD, GaD2, GgD3	Moderate	Severe	Severe
Gullied land, silty: Gs	Severe	Severe	Severe
Henry: He	Severe	Severe	Severe
Iberia: Ib	Severe	Severe	Severe
Levees and Borrow Pits: Lb.			
No interpretations.			
Loring:			
LoB, LoB2	Slight	Moderate	Slight
LoC2, LoD, LoD2, LoD3	Slight	Moderate	Moderate
Memphis:			
MeB, MeB2	Slight	Slight	Slight
MeC2, MeD2, MeD3	Slight	Slight	Moderate
MeE, MeF3, MeG	Severe	Severe	Severe
Robinsonville: Rb, Rn	Severe	Severe	Severe
Sharkey: Sh	Severe	Severe	Severe
Swamp: Sw	Severe	Severe	Severe
Tunica: Tu	Severe	Severe	Severe
Waverly: Wv	Severe	Severe	Severe

for selected nonfarm uses

Degree of limitation for—Continued			Kinds of limitations
Picnic areas, parks, and other extensive use areas	Golf course fairways	Trafficways	
Moderate	Severe	Severe	Flooding; seasonal high water table.
Severe	Severe	Severe	Seasonal high water table; slow permeability.
Severe	Severe	Severe	Flooding; clayey surface layer.
Moderate	Severe	Moderate	Seasonal high water table; slow permeability.
Moderate	Moderate	Severe	Flooding; seasonal high water table.
Severe	Severe	Severe	Flooding: seasonal high water table.
Severe	Severe	Severe	Flooding; seasonal high water table.
Severe	Severe	Severe	Flooding; rapid permeability.
Severe	Severe	Severe	Flooding; seasonal high water table.
Moderate	Moderate	Moderate	Instability; subject to settling if not well compacted.
Severe	Severe	Slight	Rapid permeability.
Slight	Moderate	Slight	Low relief.
Slight	Slight	Moderate	Slow permeability in fragipan; high erodibility on slopes.
Moderate	Moderate	Moderate	Slow permeability in fragipan; high erodibility.
Severe	Severe	Severe	Strong slopes; high erodibility; gullies.
Severe	Severe	Severe	Some ponding; seasonal high water table; slow permeability.
Severe	Severe	Severe	Flooding; slow permeability; high shrink-swell potential.
Slight	Slight	Slight	Moderate permeability.
Slight	Slight	Moderate	Moderate permeability; high erodibility on slopes.
Slight	Slight	Slight	None.
Slight	Slight	Slight	Slope; high erodibility.
Moderate	Moderate to severe	Severe	Strong slope; high erodibility.
Severe	Severe	Severe	Flooding.
Severe	Severe	Severe	Flooding; slow permeability; high shrink-swell potential.
Severe	Severe	Severe	Flooding; ponding.
Severe	Severe	Severe	Flooding; clayey surface layer.
Severe	Severe	Severe	Flooding; high water table.

TABLE 7.—*Classification of soil series into higher categories*

Series	Current system			1938 system	
	Family	Subgroup	Order	Great soil group	Order
Adler	Coarse-silty, mixed, nonacid, thermic.	Aquic Udifluvents	Entisols	Alluvial soils	Azonal.
Bonn	Fine-silty, mixed, thermic	Glossic Natraqualfs	Alfisols	Solonetz soils	Intrazonal.
Bowdre	Clayey over loamy, mixed, thermic.	Aquic Fluventic Hapludolls.	Mollisols	Alluvial soils	Azonal.
Calloway	Fine-silty, mixed, thermic	Aqueptic Fragiudalfs	Alfisols	Planosols	Intrazonal.
Collins	Coarse-silty, mixed, acid, thermic.	Aquic Udifluvents	Entisols	Alluvial soils	Azonal.
Commerce	Fine-silty, mixed, nonacid, thermic.	Aeric Fluventic Haplaquepts.	Inceptisols	Alluvial soils	Azonal.
Convent	Coarse-silty, mixed, nonacid, thermic.	Aeric Haplaquepts	Inceptisols	Alluvial soils	Azonal.
Crevasse	Mixed, thermic	Typic Udipsamments	Entisols	Regosols	Azonal.
Falaya	Coarse-silty, mixed, acid, thermic.	Aeric Fluventic Haplaquepts.	Inceptisols	Alluvial soils, intergrading to Low-Humic Gley soils.	Azonal.
Grenada	Fine-silty, mixed, thermic	Ochreptic Fragiudalfs	Alfisols	Gray-Brown Podzolic soils.	Zonal.
Henry	Coarse-silty, mixed, thermic.	Typic Fragiaqualfs	Alfisols	Planosols	Intrazonal.
Iberia	Fine, montmorillonitic, noncalcareous, thermic.	Vertic Haplaquolls	Mollisols	Humic Gley soils	Intrazonal.
Loring	Fine-silty, mixed, thermic	Typic Fragiudalfs	Alfisols	Gray-Brown Podzolic soils.	Zonal.
Memphis	Fine-silty, mixed, thermic	Typic Hapludalfs	Alfisols	Gray-Brown Podzolic soils.	Zonal.
Robinsonville	Coarse-loamy, mixed, nonacid, thermic.	Typic Udifluvents	Entisols	Alluvial soils	Azonal.
Sharkey	Very fine, montmorillonitic, nonacid, thermic.	Vertic Haplaquepts	Inceptisols	Grumusols	Intrazonal.
Tunica	Clayey over loamy, montmorillonitic, nonacid, thermic.	Vertic Haplaquepts	Inceptisols	Grumusols	Intrazonal.
Waverly	Coarse-silty, mixed, acid, thermic.	Fluventic Haplaquepts	Inceptisols	Low-Humic Gley soils	Intrazonal.

brown, well-aerated Adler and Collins soils formed. In places where water collects, the gray, poorly formed Waverly soils formed. Crevasse and Robinsonville soils, which are on natural levees along the Mississippi River, are well drained. Commerce and Bowdre soils, which are in intermediate positions, are not so well drained as Robinsonville soils. Tunica and Sharkey soils, which are in slack-water areas, are fine textured and poorly drained.

Time

The length of time required for a soil to form depends mainly on the combined influences of parent material, climate, living organisms, and relief. The differences in length of time that parent materials have been in place, therefore, are commonly reflected in the character of the soil. The soils in Shelby County range from young to old. There are soils that have little or no development and other soils that have pronounced development. Some soils on bottom lands, such as Collins and Falaya, still receive sediments during each flood. The properties of these soils differ greatly from those of Memphis soils, which have been forming for centuries. Among the criteria for judging the age of a soil are the relative thickness of the soil horizons, as reflected by contrast in color, clay content, structure, and other properties.

Classification of the Soils

Soils are classified so that we can more easily remember their significant characteristics, assemble knowledge about them, see their relationships to each other and to the whole environment, and develop principles that will help us to understand their behavior and response to use. First through classification and then through the use of soil maps, we can apply our knowledge of soils to specific fields and other tracts of land.

Two systems of classifying soils above the series level have been used in the United States in recent years. The older system was adopted in 1938 (*2*) and was revised later (*5*). The system currently used was adopted by the National Cooperative Soil Survey in 1967 (*7*). This system is under continual study. Readers interested in the development of the system should refer to the latest literature available (*3*, *7*).

The current system consists of 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 measurable or observable, but the properties are selected so that soils of similar genesis are grouped together. Placement of some soil series in the current system of classification, particularly in families, may change as more precise information becomes available.

Table 7 shows the classification of the soil series in Shelby County according to the current system. The categories of this system are defined briefly in the following paragraphs.

ORDER.—Soils are grouped into orders according to properties that seem to have resulted from the same processes acting to about the same degree on the parent material. Ten soil orders are recognized in the current system: Entisols, Vertisols, Inceptisols, Aridisols, Mollisols, Spodosols, Alfisols, Ultisols, Oxisols, and Histosols. The Entisols, Inceptisols, Mollisols, and Alfisols are represented in Shelby County.

Entisols are recent soils in which there has been little, if any, horizon development. Inceptisols occur mostly in young, but not recent, land surfaces. Mollisols have a thick, dark-colored surface layer, moderate to strong structure, and a base saturation of more than 50 percent. Alfisols contain accumulated aluminum and iron, have argillic or natric horizons, and have a base saturation of more than 35 percent.

SUBORDER.—Each order is divided into suborders, primarily on the basis of soil characteristics that indicate genetic similarity. The suborders have a narrower climatic range than the orders. The criteria for suborders reflect either the presence or absence of waterlogging, or soil differences resulting from climate or vegetation.

GREAT GROUP.—Each suborder is divided into great groups, on the basis of uniformity in kind and sequence of genetic horizons. The great group is not shown in table 7, because the name of the great group is the same as the last word in the name of the subgroup.

SUBGROUP.—Each group is divided into subgroups, one representing the central (typic) concept of the group, and other subgroups, called intergrades, having mostly the properties of one great group but also one or more properties of another great group.

FAMILIES.—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 explained in the section "How This Survey Was Made."

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Glossary

Acidity. See Reaction, soil.

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

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Available water capacity. The difference between the amount of water in a soil at field capacity and the amount in the same soil at the permanent wilting point. Commonly expressed as inches of water per inch of depth of soil.

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.

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; 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.

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

Erosion. The wearing away of the land surface by wind (sandblast), running water, and other geological agents.

Fertility, soil. The quality of a soil that enables it to provide compounds, in adequate amounts and in proper balance, for the growth of specified plants when other growth factors, such as light, moisture, temperature, and the physical condition of the soil, are favorable.

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

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.

Genesis, soil. The manner in which a soil originates. Refers especially to the processes initiated by climate and organisms that are responsible for the development of the solum, or true soil, from the unconsolidated parent material, as conditioned by relief and age of landform.

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 the following: 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.

Illuviation. The accumulation of material in a soil horizon through the deposition of suspended material and organic matter removed from horizons above. Since part of the fine clay in the B horizon (or subsoil) of many soils has moved into the B horizon from the A horizon above, the B horizon is called an illuvial horizon.

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

Loess. A fine-grained, windblown deposit consisting dominantly of silt-sized particles.

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

Mottles, soil. Irregular spots or patches of different colors, usually indicating poor aeration and lack of drainage. The pattern of mottles is described as to abundance, size, and contrast. 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.

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.*

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. As a soil separate, individual rock or mineral fragments ranging from 0.05 to 2.0 millimeters in diameter. Most sand grains consist of quartz, but sand may be of any mineral composition. The textural class name of any soil that is 85 percent or more sand and not more than 10 percent clay.

Second bottom. The first terrace above the normal flood plain of a stream.

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.

Slope. The rise or fall, in feet, for each 100 feet of horizontal distance. It is normally expressed as percentage.

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.

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in a 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.

Substratum. Technically, the part of the soil below the solum.

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.

Tongue. A narrow, vertical, wedgelike extension of one horizon into or through underlying horizons.

Topsoil. A presumed fertile soil or soil material, or one that responds to fertilization, ordinarily rich in organic matter, used to topdress roadbanks, lawns, and gardens.

Upland (geological). Land consisting of material unworked by water in recent geologic time and ordinarily lying at a higher elevation than the alluvial plain or stream terrace. Land above the lowlands along rivers.

Waterlogged. Saturated with water.

GUIDE TO MAPPING UNITS

For a full description of a mapping unit, read both the description of the mapping unit and that of the soil series to which the mapping unit belongs. The capability units are not discussed separately. For a discussion of the suitability of a given soil for crops and pasture, for woodland, for wildlife, and for lawn grasses and shrubs, see the discussion of the mapping unit. Other information is given in tables as follows:

Acreage and extent, table 2, page 11.
Estimated yields, table 3, page 38.
Engineering uses of the soils, table 4, page 42; table 5, page 44.
Nonfarm uses of the soils, table 6, page 48.

Map symbol	Mapping unit	Described on page	Capability unit
			Symbol
Ad	Adler silt loam	10	I-2
Bo	Bonn silt loam	12	IVw-1
Bw	Bowdre silty clay	12	IIw-1
Ca	Calloway silt loam	13	IIIw-2
Co	Collins silt loam	14	I-2
Cr	Commerce silt loam	14	I-2
Cs	Convent silt loam	15	IIw-1
Cu	Crevasse fine sand	15	IVs-1
Cv	Crevasse silt loam	16	IVs-1
Fm	Falaya silt loam	16	IIw-1
Fs	Filled land, silty	17	None
Fy	Filled land, sandy	17	None
GaA	Grenada silt loam, 0 to 2 percent slopes	18	IIw-2
GaB	Grenada silt loam, 2 to 5 percent slopes	19	IIe-2
GaB2	Grenada silt loam, 2 to 5 percent slopes, eroded	19	IIIe-2
GaC	Grenada silt loam, 5 to 8 percent slopes	20	IIIe-2
GaC3	Grenada silt loam, 5 to 8 percent slopes, severely eroded	20	IVe-2
GaD	Grenada silt loam, 8 to 12 percent slopes	21	IVe-2
GaD2	Grenada silt loam, 8 to 12 percent slopes, eroded	21	VIe-2
GgD3	Grenada complex, 5 to 12 percent slopes, severely eroded	21	VIe-2
Gr	Graded land, silty materials	22	None
Gs	Gullied land, silty	22	VIIe-2
He	Henry silt loam	23	IIIw-1
Ib	Iberia silt loam	25	IIIw-3
Lb	Levees and Borrow Pits	25	VIe-3
LoB	Loring silt loam, 2 to 5 percent slopes	26	IIe-1
LoB2	Loring silt loam, 2 to 5 percent slopes, eroded	27	IIIe-1
LoC2	Loring silt loam, 5 to 8 percent slopes, eroded	27	IIIe-1
LoD	Loring silt loam, 8 to 12 percent slopes	28	IVe-1
LoD2	Loring silt loam, 8 to 12 percent slopes, eroded	28	IVe-1
LoD3	Loring silt loam, 5 to 12 percent slopes, severely eroded	28	VIe-1
MeB	Memphis silt loam, 2 to 5 percent slopes	29	IIe-1
MeB2	Memphis silt loam, 2 to 5 percent slopes, eroded	30	IIIe-1
MeC2	Memphis silt loam, 5 to 8 percent slopes, eroded	30	IIIe-1
MeD2	Memphis silt loam, 8 to 12 percent slopes, eroded	31	IVe-1
MeD3	Memphis silt loam, 5 to 12 percent slopes, severely eroded	31	IVe-1
MeE	Memphis silt loam, 12 to 20 percent slopes	31	VIe-1
MeF3	Memphis silt loam, 12 to 30 percent slopes, severely eroded	32	VIe-1
MeG	Memphis silt loam, 30 to 65 percent slopes	32	VIIe-1
Rb	Robinsonville fine sandy loam	33	I-1
Rn	Robinsonville silt loam	33	I-1
Sh	Sharkey clay	33	IIIw-3
Sw	Swamp	34	VIIw-1
Tu	Tunica silty clay	34	IIIw-3
Wv	Waverly silt loam	35	IIIw-1

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