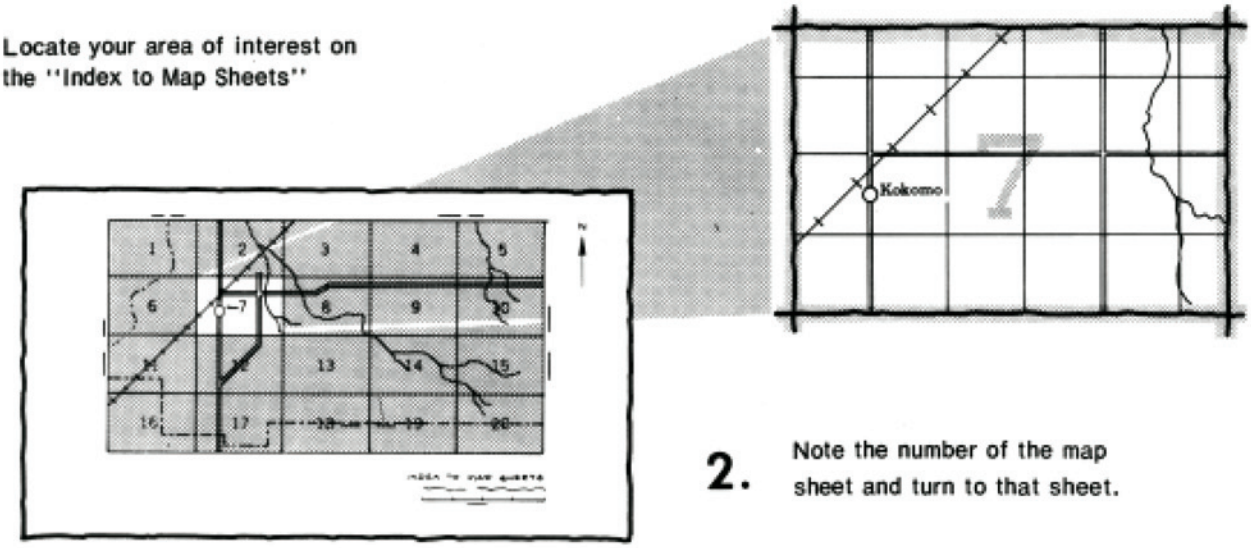
Soil Survey of
Lyon and Trigg Counties, Kentucky

United States Department of Agriculture, Soil Conservation Service
in cooperation with
Kentucky Agricultural Experiment Station and
Kentucky Department for Natural Resources and Environmental Protection

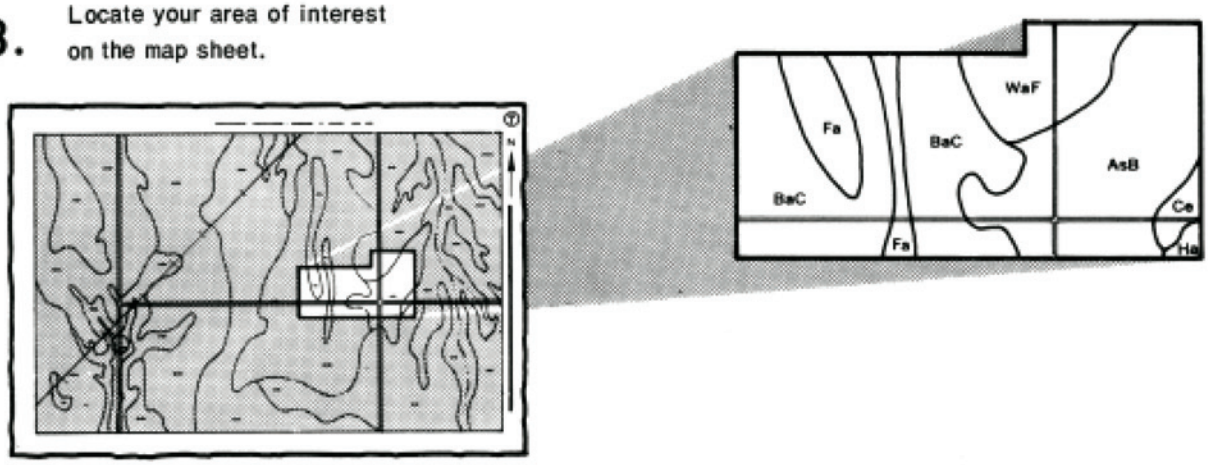
HOW TO USE

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

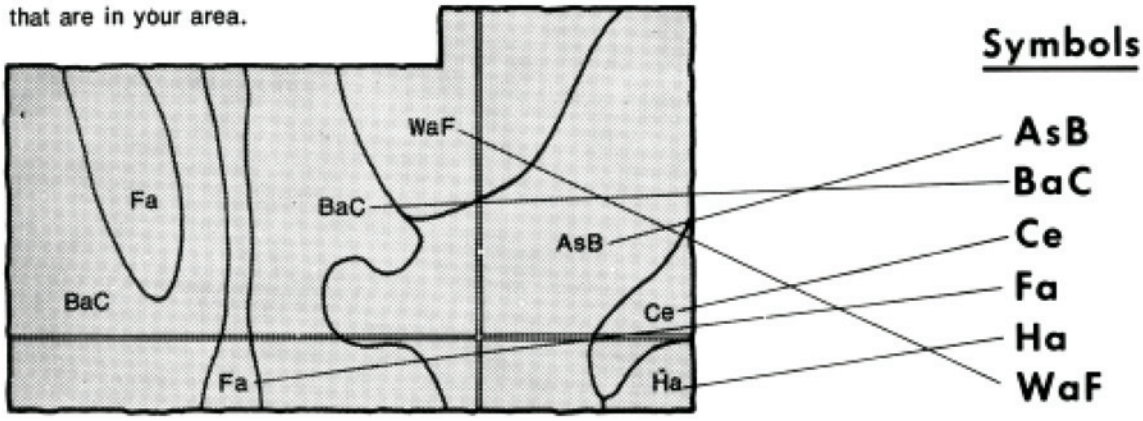


2. Note the number of the map sheet and turn to that sheet.

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

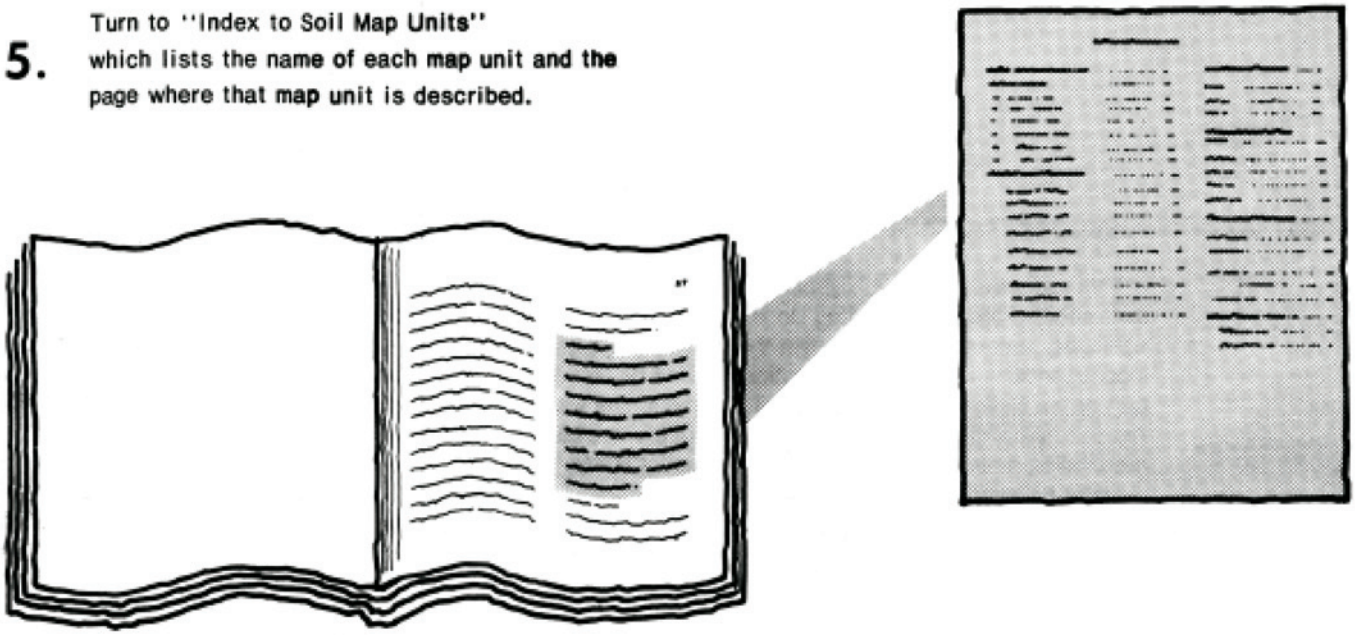


4. List the map unit symbols that are in your area.

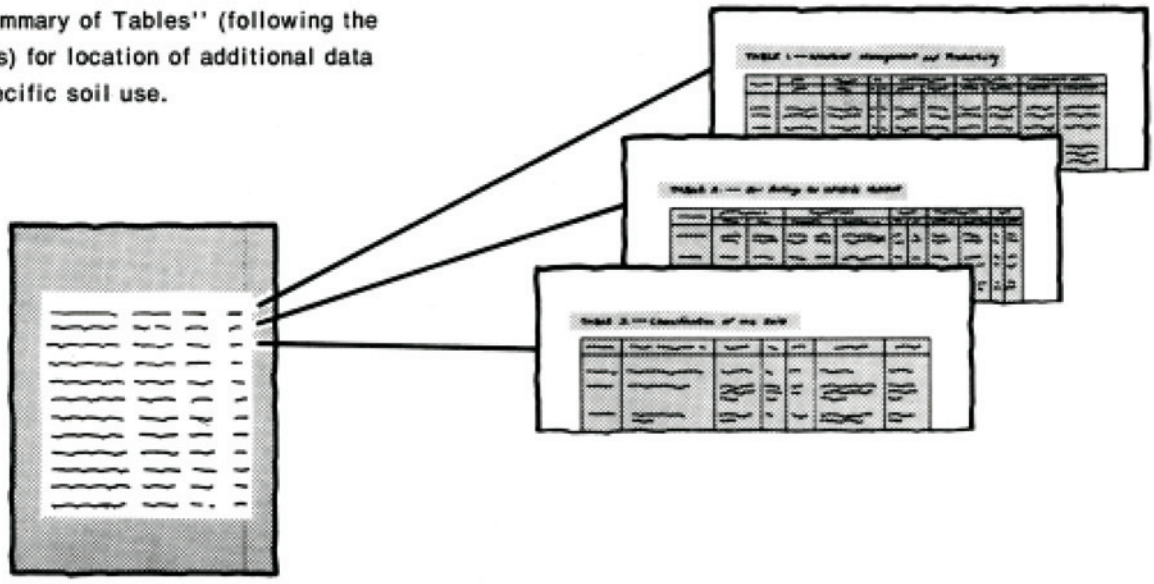


THIS SOIL SURVEY

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



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



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

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

Major fieldwork for this soil survey was performed in the period 1972-78. Soil names and descriptions were approved in 1978. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1978. This survey was made cooperatively by the Soil Conservation Service, the Kentucky Department for Natural Resources and Environmental Protection, and the Kentucky Agricultural Experiment Station. It is part of the technical assistance furnished to the Lyon County Conservation District and the Trigg County Conservation District.

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

Cover: This view of Lake Barkley State Park and Barkley Lodge takes in an area of the Hammack-Brandon map unit on the general soil map. Forestry, recreation, and urban development are the most important uses of the soils. (Photograph courtesy of the Kentucky Division of Information.)

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Issued May 1981

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foreword

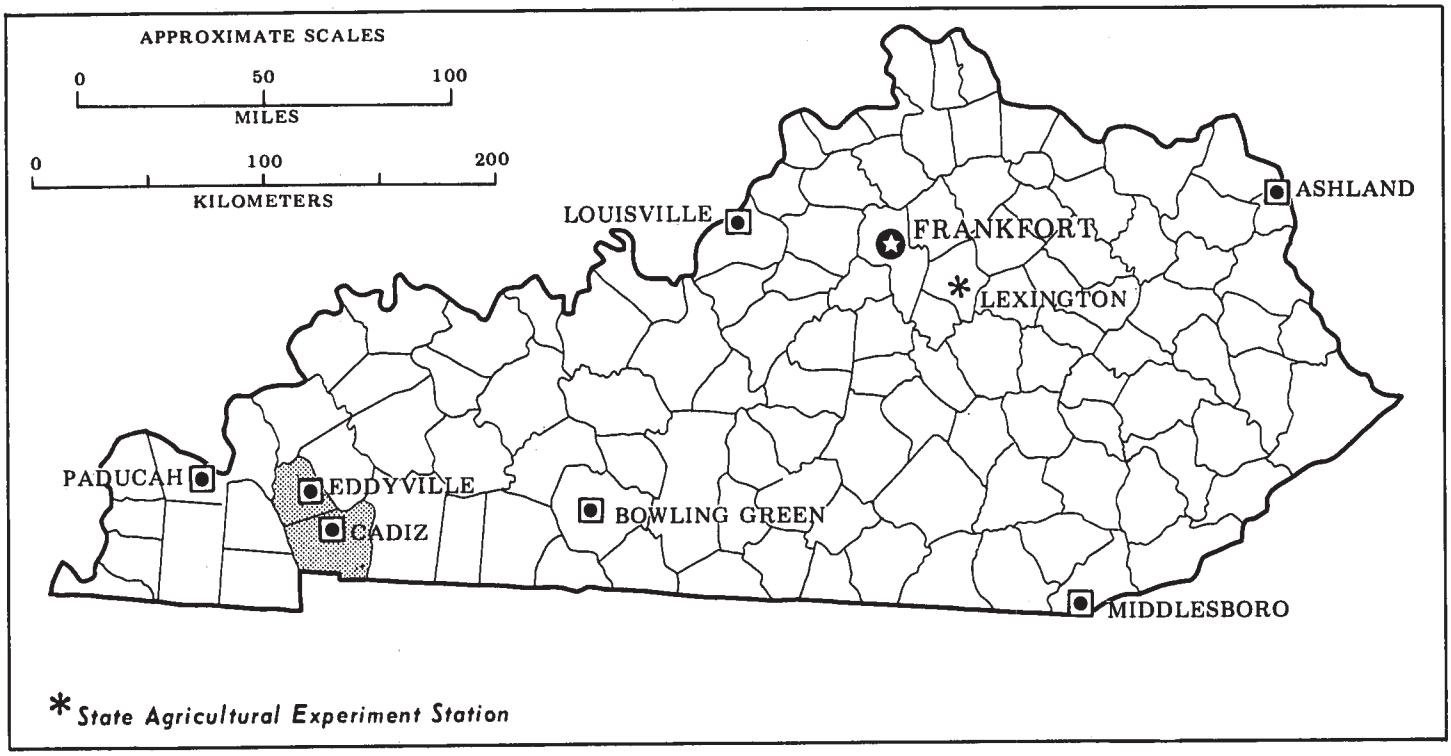
This soil survey contains information that can be used in land-planning programs in Lyon and Trigg Counties. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the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

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

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

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

Glen E. Murray
State Conservationist
Soil Conservation Service



Location of Lyon and Trigg Counties in Kentucky.

soil survey of
Lyon and Trigg Counties, Kentucky

By Maurice E. Humphrey, Soil Conservation Service

Fieldwork by Raymond A. Hayes, Maurice E. Humphrey, and Byron L. Wilson
Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service
in cooperation with the
Kentucky Agricultural Experiment Station and the
Kentucky Department for Natural Resources and Environmental Protection

LYON and TRIGG COUNTIES are in the southwestern part of Kentucky. The Tennessee River is the western boundary of both counties. In Lyon County the total land area is 142,720 acres, or 223 square miles, and in Trigg County it is 275,840 acres, or 431 square miles. Eddyville is the county seat and the largest town in Lyon County. Cadiz is the county seat and the largest town in Trigg County. A large acreage—46,500 acres in Lyon County and 65,500 acres in Trigg County—is part of the Land-Between-The-Lakes area. This area is owned by the Tennessee Valley Authority and is used for demonstration of recreation and conservation projects. It is between Kentucky Lake, which was created by Kentucky Dam on the Tennessee River, and Lake Barkley, which was created by Barkley Dam on the Cumberland River.

Most of the acreage of both counties is in the Limestone Area of the Western Pennyroyal Physiographic Area of Kentucky. The Sandstone-Shale-Limestone Area of the Western Pennyroyal takes in about 9,000 acres in northeastern Trigg County. A sizable acreage in the western part of both counties is in the Cumberland-Tennessee Rivers Physiographic Area.

Most of the soils on first bottoms and terraces have been covered by waters of Kentucky Lake or Lake Barkley. There are some areas of nearly level, well drained to poorly drained soils on first bottoms and stream terraces below Barkley Dam in Lyon County and along tributary streams in both counties.

Most of the upland soils are well drained or moderately well drained. Much of the topography in the Limestone Area of the Western Pennyroyal Area is karsted and is gently sloping or sloping. The soils in this area are used for grain, tobacco, and livestock. Soybeans, corn, wheat, burley tobacco, dark tobacco, alfalfa, pasture, and cattle and hogs are produced.

The topography in the Cumberland-Tennessee Rivers Area is characterized by long, steep or moderately steep hillsides and narrow ridgetops and branch bottoms. Most of the acreage is forest, which is used for timber products and wildlife habitat. The outdoor recreation facilities provided in this physiographic area by the Tennessee Valley Authority and by private individuals and state agencies attract tourists and create many jobs in both counties.

Small industries in Lyon and Trigg Counties and in nearby counties also contribute to the economy of the survey area.

general nature of the survey area

This section gives general information on the climate of the survey area; history and development; geology, physiography, relief, and drainage; and farming, industry, natural resources, and transportation.

climate

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

In Lyon and Trigg Counties, summers are warm and humid, and winters are moderately cold. Rainfall is fairly heavy and is well distributed throughout the year. Snow falls nearly every winter, but the snow cover generally lasts only a few days.

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

In winter the average temperature is 38 degrees F, and the average daily minimum temperature is 27 degrees. The lowest temperature on record, which occurred at Princeton on February 2, 1951, is -32 degrees. In summer the average temperature is 76 degrees, and the average daily maximum temperature is 89 degrees. The highest recorded temperature, which occurred at Princeton on July 27, 1952, is 110 degrees.

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

The total annual precipitation is 46.2 inches. Of this, 22 inches, or 48 percent, usually falls in April through September, which includes the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 19 inches. The heaviest 1-day rainfall during the period of record was 4.7 inches at Princeton on March 9, 1964. Thunderstorms occur on about 55 days each year, and most occur in summer.

Average seasonal snowfall is 11 inches. The greatest snow depth at any one time during the period of record was 11 inches. On an average of 5 days, at least 1 inch of snow is on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 80 percent. The sun shines 75 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the southwest. Average windspeed is highest, 11 miles per hour, in March.

history and development

Lyon County was carved out of the southeastern section of Caldwell County in 1854. It was named in honor of Crittenden Lyon. It has also been a part of the following counties: from 1776-1780, Kentucky County; 1780-1792, Lincoln County; 1792-1797, Logan County; 1797-1798, Christian County; 1798-1821, Livingston County; and 1821 to 1854, Caldwell County (*11*). Eddyville, the county seat, was settled by Matthew Lyon in 1799 and incorporated in 1810. It was named for the eddies in the Cumberland River.

Trigg County was established in 1820. It was named for Colonel Stephen Trigg, a native of Virginia, who came to Kentucky as a member of the Court of Land Commissioners and remained after the land surveys were completed (*12*). The county area was explored and surveyed as early as 1779, and French fur traders are believed to have been in the area much earlier. Cadiz, the county seat, was incorporated in 1822.

An iron industry began in the Land-Between-the-Lakes area about 1840 and lasted until 1920. This industry flourished because of the abundance of natural resources such as iron ore, timber, and water and the proximity to river transportation (*9*). A notable figure in this industry, William Kelly, worked for many years near Kuttawa, in Lyon County. In 1851, Kelly discovered the airboiling process for manufacture of steel. Because Kelly was delayed in obtaining a patent, the credit for the discovery went to an Englishman, Bessemer, who obtained patents on the same process in 1855 (*9*).

The Land-Between-the-Lakes area was called the Land-Between-the-Rivers before the dams were constructed. The Tennessee Valley Authority bought the entire area and relocated the inhabitants. Now this area is much like it was when the first settlers came. Tourists from all over the nation come to see it.

In 1860 the population of Lyon County was 5,807. The population increased steadily until it reached a high of 9,423 in 1910 (*11*). During the next two decades, it decreased. In 1940 the population reached a second high of 9,067. From 1940 until 1970 there was a steady decrease to 5,562. The estimates compiled by the Kentucky Department of Commerce show that the population then rose to 5,900 by 1976.

In Trigg County the population was 10,129 in 1850 and at a peak of 14,539 in 1910. By 1940 it had reduced to 12,784. It steadily decreased until 1970, when it was 8,620. The estimates compiled by the Kentucky Department of Commerce show that the population then rose to 9,100 by 1976. The only area in Trigg County that has as many or more people now as in 1920 is the Cadiz area (*7*). Future population growth will occur mainly in subdivisions near Cadiz, in subdivisions near Lake Barkley, and between Cadiz and the I-24 and U.S. 68 interchange.

geology, physiography, relief, and drainage

The geologic formations of Lyon and Trigg Counties belong to the Mississippian, Cretaceous, and Quaternary Systems (*13*).

Most of the acreage in both counties belongs to the Meramec Series of the Mississippian System. On this acreage the surface generally is gently sloping or

sloping. Many basins and sinkholes, characteristic of karst topography, are over most of the area. There are some surface branches and streams, but much of the runoff from rainfall enters underground streams through sinkholes and basins. There are also caves in this area. The only hard rocks are limestone. Some contain chert. The elevation ranges from about 360 to 550 feet.

In the northeastern part of Trigg County, about 9,000 acres belongs to the Chester Series of the Mississippian System. The surface of most of this acreage is nearly level to sloping. The elevation generally ranges from 450 to 550 feet, but several hills are more than 800 feet. These moderately steep hills make up about 2,000 acres. Some sinkholes and basins are in the Chester Series area, but most of the runoff is through surface streams. Most geologic formations contain limestone, sandstone, and shale. Some contain just sandstone and shale; some, just limestone.

The Mississippian formation in Kentucky is called the Pennyroyal or Pennyrile (*13*). Because this formation covers a large area in the southern part of the state, it is divided into the Eastern and Western Pennyroyal. This survey area is on the Western Pennyroyal Formation.

The Cretaceous System takes in a sizable area in the western part of both counties. Most of the acreage is in the Land-Between-the-Lakes area; some acreage is at higher elevations both east and west of Lake Barkley. The very gravelly Tuscaloosa Formation, which generally has a grayish color, is the most extensive formation; in several places there are remnants of the reddish, loamy McNary Formation. Cretaceous formations generally range in elevation from about 550 to 660 feet. Mississippian formations in the same general area are at an elevation below 550 feet. This area in Kentucky is called the Cumberland-Tennessee Rivers Physiographic Area. The side slopes are long and steep or moderately steep. The ridgetops and first bottoms generally are narrow. Most of the gravel is chert that has been rounded by movement of water. Limestone and iron ore commonly are near the contact between Mississippian and Cretaceous formations.

The Quaternary System contains gravelly continental deposits, loess, and alluvium. In some places near Kentucky Lake and on the east side of Lake Barkley it contains unconsolidated sand deposits that are slightly argillaceous and silty in places (*8*). The continental deposits and sand deposits overlie the older Cretaceous and Mississippian formations. The sand deposits are at an elevation of 360 to 520 feet. The continental deposits are at an elevation of 380 to 660 feet. The rounded gravel in the continental deposits is mostly chert but, unlike the gravel in the Tuscaloosa Formation of the Cretaceous System, contains quartz. The continental deposits and the Tuscaloosa Formation are called Coastal Plain deposits because they are connected with intrusions of the Gulf of Mexico. The continental deposits also occur in the Purchase Physiographic Area of western Kentucky but the Tuscaloosa Formation occurs only in the Cumberland-Tennessee Rivers Physiographic Area.

Loess—silty material deposited by wind—overlies most of the uplands and some high stream terraces. It is as much as 4 feet thick. Even in soils that have gravel or chert in the surface layer, the upper one foot of material is usually high in silt that is believed to be loess. The loess probably was deposited during interglacial or postglacial periods. It is thicker on the east and south sides of major streams. The loess is thicker in the eastern part of the survey area than in the western part. Much of the loess in the eastern part probably derives from the wide flood plains of the Ohio River, and the loess in the western part probably derives from the flood plains of the Mississippi River and the narrow Ohio River.

Most of the alluvium of the Quaternary System is covered by Kentucky Lake or Lake Barkley. Thick alluvium is on first bottoms and terraces of the Cumberland River below Barkley Dam in Lyon County. Thinner alluvial deposits are along tributaries of the Cumberland and Tennessee Rivers.

The Cumberland River and its tributaries drain all of the survey area except the western part of the Land-Between-the-Lakes area, which is drained by the Tennessee River and its tributaries.

farming, industry, natural resources, and transportation

Much of the total income in Lyon and Trigg Counties has always come from the sale of farm products.

In Lyon County in 1973, 1,430 people were employed. Of these, 190 had agricultural jobs. In Trigg County in 1976, 3,710 people were employed. Of these, 656 had agricultural jobs. Manufacturing furnished 245 of the nonagricultural jobs in Lyon County and 501 in Trigg County.

Soil and water are the main natural resources of Lyon and Trigg Counties. Limestone, gravel, sand, and iron ore also are important.

In much of the eastern and central parts of the survey area, the soils are used for crops and for livestock production. The centers of manufacturing and industry are in these parts also. In the western part of the survey area, the soils are used mainly for forests and recreation use. According to the 1970 Kentucky Soil and Water Conservation Needs Inventory (*10*) there were 28,222 acres of forestland in Lyon County and 52,587 acres of forestland in Trigg County.

In most places, wells provide an adequate amount of water. Water districts have been formed to serve the hundreds of customers in the towns and the subdivisions on Lake Barkley and near the towns.

A network of federal and state highways serves these counties. The Western Kentucky Parkway and I-24 are four-lane Federal highways, and U.S. 641 and 68 are two-lane Federal highways. The Illinois Central Gulf

Railroad and the Cadiz Railroad, which joins the Illinois Central Gulf Railroad at Gracey, also serve these counties.

Water transportation is available on the Cumberland and Tennessee Rivers. These two rivers are connected by the canal that connects Kentucky Lake and Lake Barkley.

Commercial air transportation is available at Paducah, Kentucky and Clarksville, Tennessee.

how this survey was made

Soil scientists made this survey to learn what soils are in the survey area, where they are, and how they can be used. They observed the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; the kinds of native plants or crops; and the kinds of rock. They dug many holes to study soil profiles. A profile is the sequence of natural layers, or horizons, in a soil. It extends from the surface down into the parent material, which has been changed very little by leaching or by plant roots.

The soil scientists recorded the characteristics of the profiles they studied and compared those profiles with others in nearby counties and in more distant places. They classified and named the soils according to nationwide uniform procedures. They drew the boundaries of the soils on aerial photographs. These photographs show trees, buildings, fields, roads, and other details that help in drawing boundaries accurately. The soil maps at the back of this publication were prepared from aerial photographs.

The areas shown on a soil map are called map units. Most map units are made up of one kind of soil. Some are made up of two or more kinds. The map units in this survey area are described under "General soil map units" and "Detailed soil map units."

While a soil survey is in progress, samples of some soils are taken for laboratory measurements and for engineering tests. All soils are field tested to determine their characteristics. Interpretations of those characteristics may be modified during the survey. Data are assembled from other sources, such as test results, records, field experience, and state and local specialists. For example, data on crop yields under defined management are assembled from farm records and from field or plot experiments on the same kinds of soil.

But only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then needs to be organized so that it can be used by farmers, woodland managers, engineers, planners, developers and builders, home buyers, and others.

general soil map units

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

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

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

In the map unit descriptions the soils are rated for suitability for cultivated crops, specialty crops, woodland use, urban uses, and recreation uses. Cultivated crops are those grown extensively in the survey area. Specialty crops are the vegetables and fruits that generally require intensive management. Woodland refers to areas of native or introduced trees. Urban uses include residential, commercial, and industrial developments. Intensive recreation areas are campsites, picnic areas, ballfields, and other areas that are subject to heavy foot traffic. Extensive recreation areas are those used for nature study and as wilderness.

soil descriptions for Lyon County

1. Nolin-Newark-Robertsville

Deep, nearly level, well drained to poorly drained soils; on flood plains and stream terraces

This map unit takes in an area below Barkley Dam. It includes parts of Lake Barkley and Kentucky Lake.

This map unit makes up about 2 percent of Lyon County. It is about 24 percent Nolin soils, 22 percent Newark soils, 21 percent Robertsville soils, and 33 percent soils of minor extent.

The Nolin soils are generally near the stream channels. These soils are well drained. They have a brown silt loam surface layer and a loamy, moderately permeable subsoil.

The Newark soils are on first bottoms and are somewhat poorly drained. They have a dark grayish brown silt loam surface layer and a loamy, moderately permeable subsoil.

The Robertsville soils are on stream terraces and are poorly drained. They have a grayish brown silt loam surface layer and a loamy subsoil. A slowly permeable fragipan is at a depth of 26 inches.

Of minor extent in this map unit are the well drained, gravelly Clifty soils, the poorly drained Melvin soils, and the moderately well drained Lindside soils on first bottoms. There are small areas of the moderately well drained Otwell soils, the somewhat poorly drained Lawrence soils, and the well drained Elk soils on stream terraces.

The soils in this map unit are used mainly for corn and soybeans. On some tracts they are used as woodland and pasture.

On most of the acreage the soils are seldom flooded during the growing season. They are, however, commonly flooded in winter and spring, and in some places, this flooding often lasts long enough to destroy pasture and meadow plants. In some small places the soils are not subject to flooding. In some places they could easily be protected from the flooding.

The soils in this map unit are suited to cultivated crops, to hay and pasture, and to such specialty crops as vegetables. They are poorly suited to orchards and vineyards because of lack of air movement. They are well suited to woodland use. Because of the flood hazard, the wetness of the Newark soils, and the wetness and the slow permeability of the Robertsville soils, the soils are poorly suited to urban uses and to intensive recreation uses.

2. Baxter-Hammack

Deep, steep to sloping, well drained soils formed in cherty limestone residuum or in shallow loess and cherty limestone residuum; on uplands

The largest area of this map unit is near the streams that flow into the east side of Lake Barkley. Smaller areas are near the streams that flow into the west side of Lake Barkley and into Kentucky Lake.

This map unit makes up about 40 percent of Lyon

County. It is about 35 percent Baxter soils, 26 percent Hammack soils, and 39 percent soils of minor extent. The pattern of soils in this unit is the same as that in the Baxter-Hammack-Brandon unit in Trigg County.

The Baxter and Hammack soils are intermingled. The Baxter soils are dominant on the steep side slopes. The Hammack soils are dominant on the narrow ridgetops and on the sloping to moderately steep side slopes.

Baxter soils have a brown cherty silt loam surface layer. The subsoil is dominantly clayey and cherty and is moderately permeable.

Hammack soils have a brown silt loam surface layer. The subsoil is loamy in the upper part and dominantly cherty and clayey in the lower part and is moderately permeable.

Of minor extent in this map unit are Brandon soils, well drained gravelly Saffell soils, and moderately well drained Lax and Nicholson soils on uplands. Well drained gravelly Clifty soils, well drained Nolin soils, moderately well drained Lindside soils, and somewhat poorly drained Newark soils are on first bottoms.

The soils in this map unit are used mainly as woodland. In some areas they are used for cultivated crops and for pasture and hay. Recreation is also a major use. Many recreation homes are on the east side of Lake Barkley. The Land-Between-the-Lakes area is especially good for hunting, fishing, camping, picnicking, and other activities.

Because of steepness of slope, the soils of this unit are poorly suited to cultivated crops, meadow crops, and most specialty crops and to urban and intensive recreation uses. They are suited to pasture and well suited to woodland use and to extensive recreation uses.

3. Brandon-Saffell

Deep, very steep to sloping, well drained soils formed in gravelly or very gravelly Coastal Plain material or in loess and gravelly Coastal Plain material; on uplands

This map unit is between Lake Barkley and Kentucky Lake on uplands that are highly dissected by a dendritic drainage system.

This map unit makes up about 23 percent of Lyon County. It is about 33 percent Brandon soils, 19 percent Saffell soils, and 48 percent soils of minor extent (fig. 1).

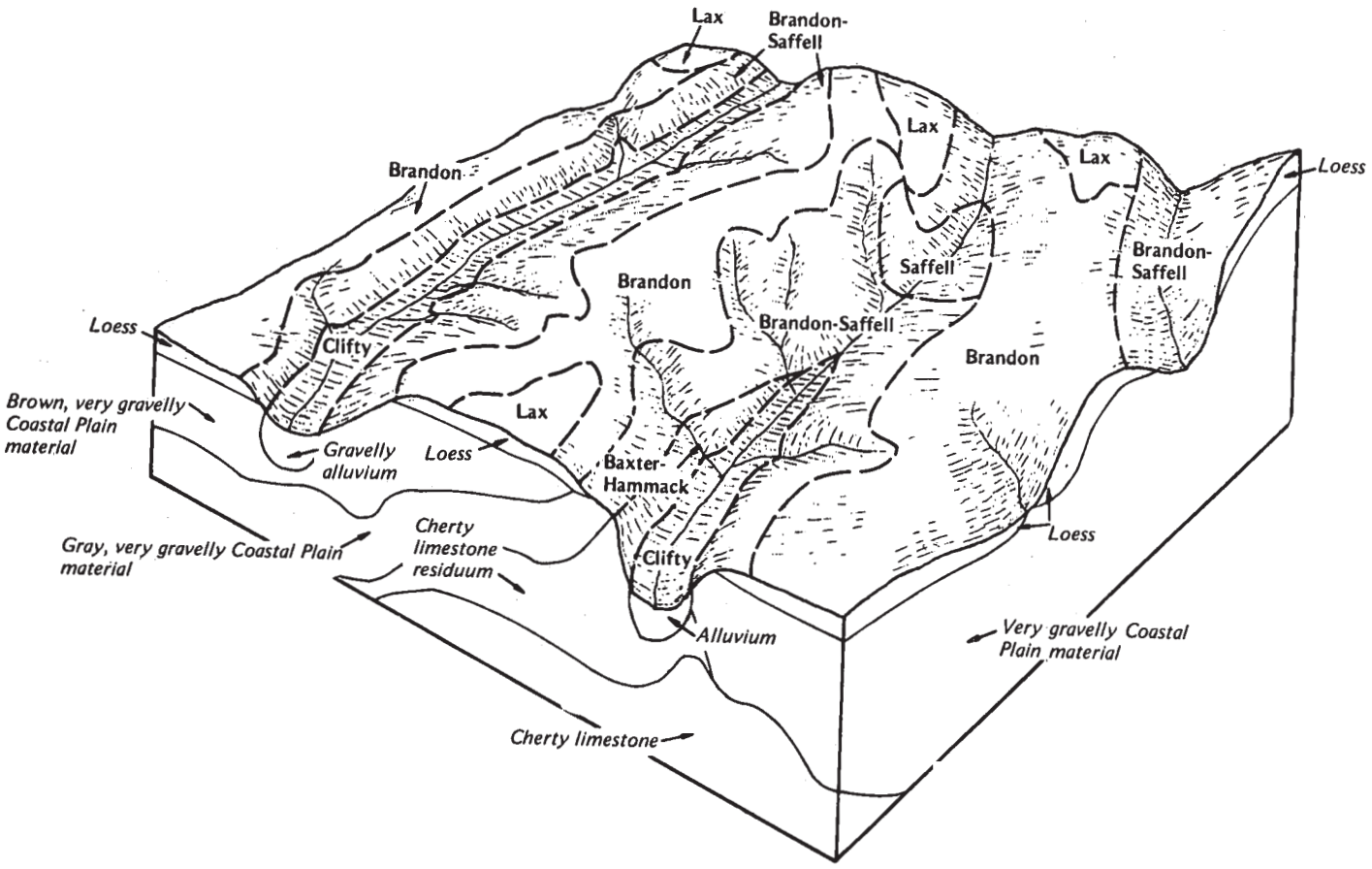


Figure 1.—Typical pattern of soils and underlying material in the Brandon-Saffell map unit.

The sloping to moderately steep Brandon soils are on ridgetops and side slopes. The steep and very steep Brandon soils are intermingled in a complex with Saffell gravelly silt loam. The Brandon soils generally are on north- and east-facing slopes, and the Saffell soils generally are on south- or west-facing slopes.

Brandon soils have a brown silt loam surface layer and a loamy, moderately permeable subsoil. Gravelly, loamy, moderately rapidly permeable to rapidly permeable material underlies the subsoil.

Saffell soils have a dark grayish brown and yellowish brown gravelly silt loam surface layer and a gravelly to very gravelly, loamy, moderately permeable subsoil.

Of minor extent in this map unit are moderately well drained Lax soils on ridgetops throughout the mapped area and well drained Lexington soils on uplands near Kentucky Lake. On first bottoms are well drained Clifty gravelly silt loam and Nolin silt loam, moderately well drained Lindside silt loam, and somewhat poorly drained Newark silt loam.

All of the acreage of this map unit is in the Land-Between-the-Lakes, an area which the Tennessee Valley Authority is developing as a national demonstration in outdoor recreation and environmental education. The soils are used mainly as woodland and for extensive recreation activities, such as hunting, fishing, hiking, boating, and riding horses and off-the-road motor vehicles. In some areas, mostly along branches and creeks, the soils are cleared and planted to cultivated crops and pasture plants, which are used primarily as food for wildlife.

The soils in this map unit are poorly suited to cultivated crops and meadow crops because of the steepness of slope and the high content of gravel in the Saffell soils. They are suited to pasture plants. They are also suited to woodland use and to extensive recreation uses. Mainly because of the steepness of slope, they are poorly suited to urban uses and intensive recreation uses. The gravel in the Saffell soils is used for surfacing roads and for other construction work.

4. Nicholson-Hammack

Deep, gently sloping and sloping, moderately well drained and well drained soils formed in loess and cherty limestone residuum; on uplands

The soils in this map unit are on ridgetops and side slopes and in karst areas. The areas are in the northern and southern parts of Lyon County and Trigg County.

This map unit makes up about 8 percent of Lyon County. It is about 59 percent Nicholson soils, 13 percent Hammack soils, and 28 percent soils of minor extent.

The Nicholson soils are moderately well drained. They are on broad ridgetops and the upper part of side slopes. They have a dark grayish brown to yellowish brown silt loam surface layer. The upper part of the subsoil is strong brown to yellowish brown, loamy, and moderately permeable; the lower part consists of a loamy, slowly permeable fragipan underlain by layers of clayey material.

The Hammack soils are well drained. They are on narrow ridges and side slopes and in karst areas. They have a brown silt loam surface layer. The subsoil is moderately permeable. It is loamy in the upper part and dominantly cherty and clayey in the lower part.

Of minor extent in this map unit are poorly drained Robertsville soils, and somewhat poorly drained Lawrence soils on upland flats and in depressions and well drained Baxter soils mapped in complex with the Hammack soils on side slopes. Well drained Nolin soils, moderately well drained Lindside soils, and somewhat poorly drained Newark soils are on the first bottoms.

The soils in this map unit are used mostly for cultivated crops and for hay and pasture. Woodland is in some areas.

The soils in this map unit are well suited to cultivated crops, most specialty crops, and pasture and meadow crops. Wetness and the erosion hazard are limitations to the use of the soils as cropland, pasture and meadow, but these limitations can be overcome by using good crop management practices and other erosion control measures. The soils in this unit are well suited to woodland use and to extensive recreation uses. They are suited to urban uses and to intensive recreation uses. The wetness and slow permeability caused by the fragipan in Nicholson soils, the shrink-swell potential of the lower part of the subsoil of Hammack soils, and slope are limitations to those uses.

5. Crider-Pembroke

Deep, gently sloping to sloping, well drained soils formed in loess and limestone residuum; on karst uplands

This map unit is in the northeastern part of Lyon County. The soils of this unit are on broad ridges of the Meramec Series of Mississippian age and are generally at an elevation of less than 490 feet.

This map unit makes up about 2 percent of Lyon County. It is about 62 percent Crider soils, 16 percent Pembroke soils, and 22 percent soils of minor extent.

The Crider soils are dominant on broad ridges and in undulating karst areas. These soils are well drained and moderately permeable. They have a brown silt loam surface layer. The subsoil is loamy in the upper part and clayey in the lower part.

The Pembroke soils are on side slopes. These soils are well drained and are moderately permeable. They have a dark brown silt loam surface layer. The subsoil is loamy in the upper part and clayey in the lower part.

Of minor extent in this map unit are well drained Nolin soils, moderately well drained Lindside soils, and somewhat poorly drained Newark soils in depressions and along drainageways. On uplands are well drained, moderately deep Fredonia soils, moderately well drained Nicholson soils, and well drained Hammack soils. Well

drained Elk soils and moderately well drained Otwell soils are on the stream terraces.

The soils in this map unit are used for growing cultivated crops and raising beef cattle. Nearly all of the acreage of this highly productive unit has been cleared. Most farmers grow only cash grain crops and tobacco. Some also raise beef cattle. Burley tobacco and dark-fired tobacco are grown on most farms, and dark air-cured tobacco is grown on some farms. The erosion hazard is the main limitation to farming.

The soils in this map unit are well suited to cultivated crops, most specialty crops, hay and pasture plants, and trees. They are well suited to most urban uses and intensive or extensive recreation uses. Slope and the shrink-swell potential of the clayey parts of the subsoil are the main limitations to those uses.

6. Hammack-Baxter-Nicholson

Deep, gently sloping to moderately steep, well drained and moderately well drained soils formed in loess and cherty limestone residuum or in cherty limestone residuum; on karst uplands

The soils in this map unit are on ridgetops, side slopes, and karst topography near Lake Barkley and the areas of the gently sloping to sloping Crider-Pembroke map unit (fig. 2).

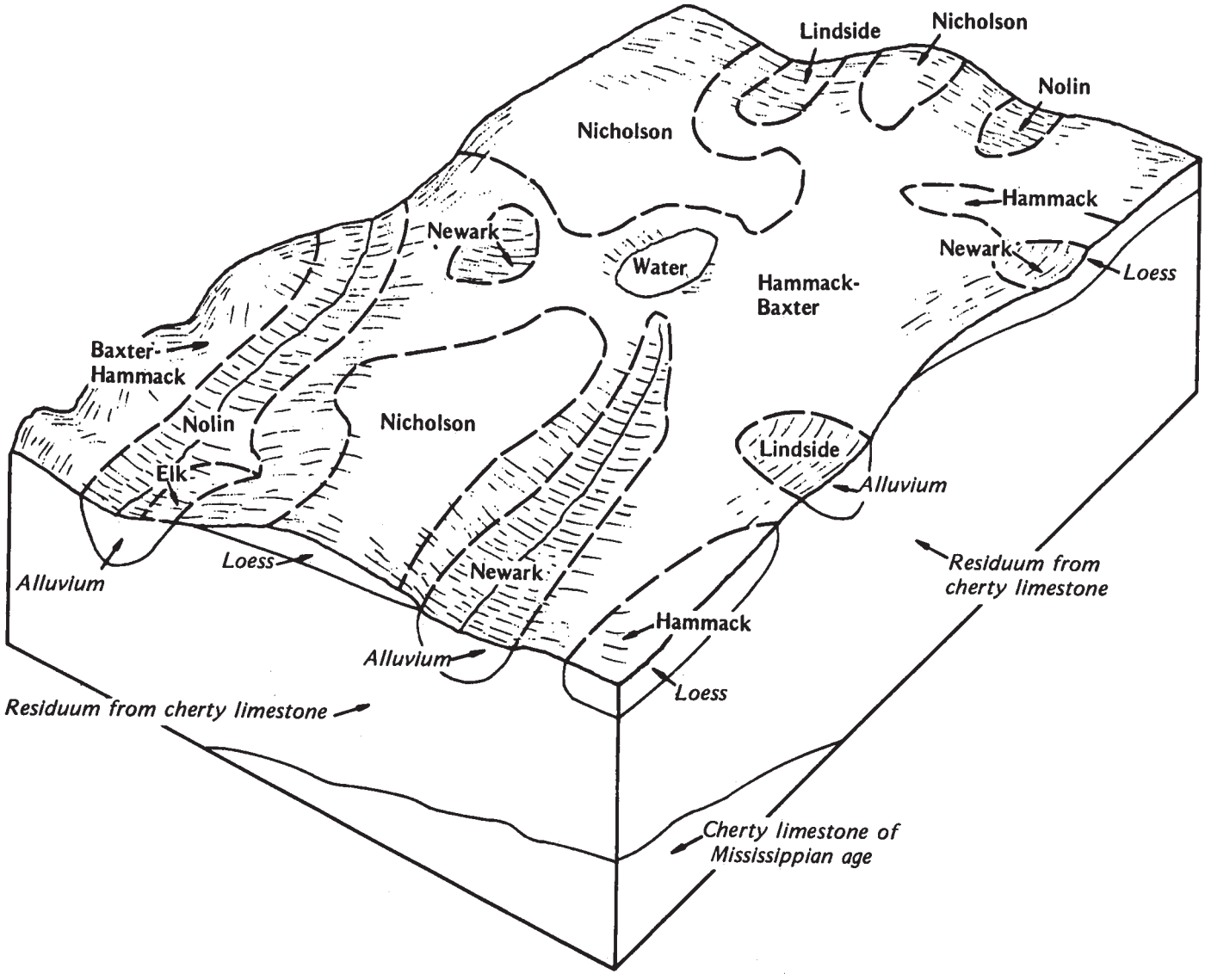


Figure 2.—Typical pattern of soils and underlying material in the Hammack-Baxter-Nicholson map unit.

This map unit makes up about 18 percent of Lyon County. It is about 31 percent Hammack soils, 22 percent Baxter soils, 22 percent Nicholson soils, and 25 percent soils of minor extent.

The Hammack soils are dominantly on ridgetops and are gently sloping. The Baxter soils are dominantly on the lower part of side slopes, adjacent to the valley floors, and are gently sloping to moderately steep. On the side slopes and on the rims of depressions, the Hammack and Baxter soils are intermingled. The Nicholson soils are on broad ridgetops and on the upper part of side slopes and are gently sloping to sloping.

The Baxter soils are moderately permeable and well drained. The surface layer is brown cherty silt loam. The subsoil is dominantly cherty and clayey.

The Hammack soils are moderately permeable and well drained. The surface layer is brown silt loam except where erosion has removed most of the original surface layer. In the eroded areas it is silty clay loam. The subsoil is loamy in the upper part and dominantly clayey and cherty in the lower part.

The Nicholson soils are moderately well drained. The surface layer is dark grayish brown to yellowish brown silt loam. The upper part of the subsoil is loamy and moderately permeable. The lower part consists of a loamy, slowly permeable fragipan and, below that, layers of clayey material.

Of minor extent in this map unit are the well drained Crider and Pembroke soils on uplands and the well drained Elk soils on stream terraces. In depressions and on first bottoms along streams are the well drained Nolin soils, the moderately well drained Lindside soils, and the somewhat poorly drained Newark soils.

The soils in this map unit are used for cultivated crops and for pasture and hay. There is some woodland, mainly in the steeper areas.

The soils in this map unit are suited to cultivated crops and specialty crops. They are well suited to pasture and to meadow crops. The hazard of erosion is the main limitation to the use of these soils as cropland and pasture (fig. 3). Because some slopes are irregular the application of some erosion control measures is difficult. These soils are well suited to woodland use and to extensive recreation uses. In most areas they are well suited to urban uses and to intensive recreation uses, but the slow permeability and wetness of the Nicholson soils, the high content of clay and the shrink-swell potential of the Hammack and Baxter soils, and the slope are limitations to those uses.

7. Brandon-Lax

Deep, gently sloping to moderately steep, well drained and moderately well drained soils formed in loess and gravelly Coastal Plain material; on uplands

This map unit is in the Land-Between-the-Lakes area of Lyon County. It takes in the ridge and upper part of side slopes in the area that divides the drainage into the Cumberland River from the drainage into the Tennessee River.

This map unit makes up about 7 percent of Lyon County. It is about 53 percent Brandon soils, 29 percent Lax soils, and 18 percent soils of minor extent.

The Brandon soils are mostly on narrow ridges and side slopes. They are well drained. The surface layer is brown silt loam except in severely eroded areas, where it is silty clay loam. The loamy, moderately permeable subsoil is underlain by gravelly, loamy, moderately rapidly permeable to rapidly permeable material.

The Lax soils are on ridgetops and on the side slopes of the upper reach of branches. They are moderately well drained. The surface layer is brown silt loam except in severely eroded areas, where it is silty clay loam. The upper part of the subsoil is loamy and moderately permeable, and the lower part is a loamy, slowly permeable fragipan underlain by a gravelly, clayey layer.

Of minor extent in this map unit are Nolin, Clifty, Lindside, and Newark soils on first bottoms and Saffell, Hammack, Baxter, and Lawrence soils on uplands. All of these soils except the Lindside, Newark, and Lawrence soils are well drained. The Lindside soils are moderately well drained and the Newark and Lawrence soils are somewhat poorly drained.

The soils in this unit are used mostly as woodland and for recreation. In some areas they are cleared and used for cultivated crops and for pasture and meadow plants, some of which are left for wildlife.

The soils in this map unit are suited to cultivated crops and well suited to pasture and meadow crops. The hazard of erosion is the main limitation. The soils are well suited to extensive recreation uses and to woodland use. In most areas they are suited to urban uses and to intensive recreation uses, but slope and, in the Lax soils, wetness and slow permeability caused by the fragipan are limitations to those uses.

soil descriptions for Trigg County

1. Nolin-Lindside-Elk

Deep, nearly level and gently sloping, well drained and moderately well drained soils; on flood plains and stream terraces

This map unit takes in soils on flood plains throughout the survey area. It includes parts of Lake Barkley and Kentucky Lake.

This soil unit makes up about 2 percent of Trigg County. It is about 49 percent Nolin soils, 13 percent Lindside soils, 10 percent Elk soils, and 28 percent soils of minor extent.

The Nolin and Lindside soils are on flood plains. The Elk soils are on stream terraces. The Nolin and Elk soils are well drained, and the Lindside soils are moderately well drained. These soils have a brown silt loam surface layer and a loamy, moderately permeable subsoil.

Figure 3.—Soybeans emerging from wheat stubble in an area of Hammack soils. No-tillage is used because of the hazard of erosion.

Of minor extent in this map unit are well drained gravelly Clifty soils, poorly drained Melvin soils, and somewhat poorly drained Newark soils on first bottoms. Small areas of moderately well drained Otwell soils, somewhat poorly drained Lawrence soils, and poorly drained Robertsville soils are on the stream terraces.

The soils in this unit are used mainly for corn and soybeans, but on some tracts they are used as woodland and pasture.

On most of the acreage the soils are seldom flooded during the growing season. They are, however, commonly flooded in winter and early in spring, and in some places, this flooding often lasts long enough to damage pasture and meadow plants. In some small places the soils are not subject to flooding. In some places they could easily be protected from flooding.

The soils in this map unit are well suited to cultivated crops and to hay and pasture. The slight wetness of the Lindside soils, the erosion hazard on the Elk soils, and flooding in winter and early in spring are the main limitations to the use of these soils as cropland, hayland, and pasture. The soils are also well suited to most specialty crops, to woodland use, and to extensive recreation uses. Because of flooding in winter and early

in spring, they are poorly suited to most urban uses, to intensive recreation uses, and to perennial pasture and meadow plants.

2. Baxter-Hammack-Brandon

Deep, steep to sloping, well drained soils formed in cherty limestone residuum or in loess over cherty limestone residuum or gravelly Coastal Plain material; on uplands

The largest area of this map unit is near the streams that flow into the east side of Lake Barkley. Smaller areas are near the streams that flow into the west side of Lake Barkley and into Kentucky Lake.

This map unit makes up about 35 percent of Trigg County. It is about 25 percent Baxter soils, 24 percent Hammack soils, 12 percent Brandon soils, and 39 percent soils of minor extent.

The Baxter soils are intermingled with the Hammack soils (fig. 4). On the steep side slopes, the Baxter soils are the dominant part of the complex. On the narrow ridgetops and sloping to moderately steep side slopes, the Hammack soils are dominant. The sloping to steep Brandon soils are on the higher ridgetops and on side slopes where loess overlies Coastal Plain material.

Baxter soils have a brown cherty silt loam surface layer and a moderately permeable subsoil that is dominantly clayey and cherty.

Hammack soils have a brown silt loam surface layer. The moderately permeable subsoil is loamy in the upper part and dominantly clayey and cherty in the lower part.

Brandon soils have a brown silt loam surface layer and a loamy, moderately permeable subsoil underlain by gravelly, loamy, moderately rapidly permeable to rapidly permeable material.

Of minor extent in this map unit are well drained gravelly Saffell soils and moderately well drained Lax and Nicholson soils on upland. On the first bottoms, gravelly, well drained Clifty soils, well drained Nolin soils,

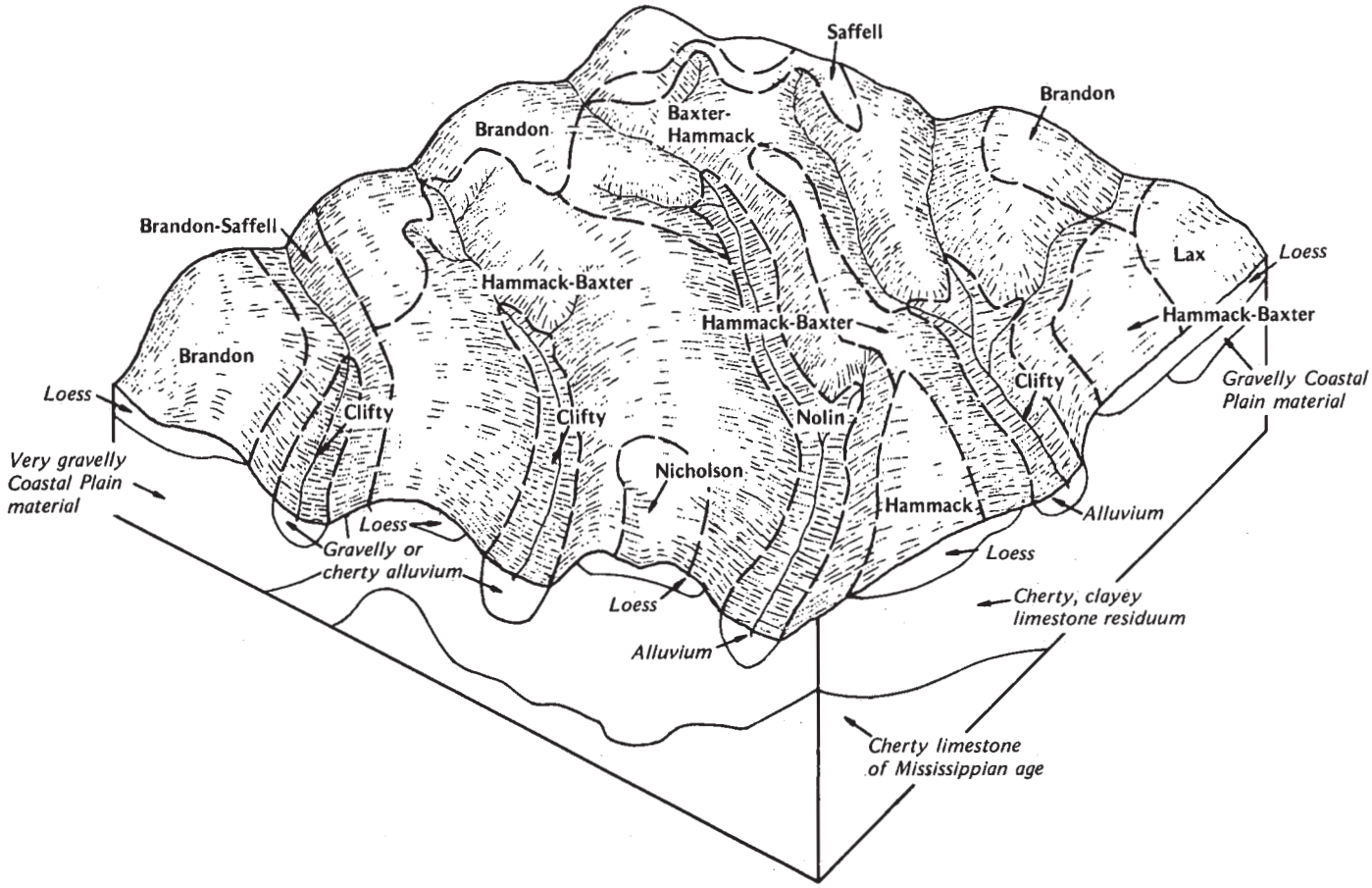


Figure 4.—Typical pattern of soils and underlying material in the Baxter-Hammack-Brandon map unit.

moderately well drained Lindside soils, and somewhat poorly drained Newark soils are of minor extent.

The soils of this map unit are used mainly as woodland. In some areas, they are used for cultivated crops and for pasture and hay. Recreation is also a major use. Many recreation homes are on the east side of Lake Barkley. The Land-Between-the-Lakes area is especially good for hunting, fishing, camping, picnicking, and other activities.

Because of the steepness of slope, the soils of this unit are poorly suited to cultivated crops, meadow crops, and most specialty crops. They are suited to pasture. They are well suited to woodland uses and extensive recreation uses. Mainly because of the steepness of slope, they are poorly suited to urban uses and intensive recreation uses.

3. Brandon-Saffell

Deep, very steep to sloping, well drained soils formed in gravelly or very gravelly Coastal Plain material or in loess and gravelly Coastal Plain material; on uplands

This map unit is between Lake Barkley and Kentucky Lake on uplands that are highly dissected by a dendritic drainage system.

This map unit makes up about 13 percent of Trigg County. It is about 50 percent Brandon soils, 27 percent Saffell soils, and 23 percent soils of minor extent.

The sloping to moderately steep Brandon soils are on ridgetops and side slopes. The steep and very steep Brandon soils are intermingled in a complex with Saffell soils. The Brandon soils generally are on north- or east-facing slopes, and the Saffell soils generally are on south- or west-facing slopes.

Brandon soils have a brown silt loam surface layer and a loamy, moderately permeable subsoil underlain by gravelly, loamy, moderately rapidly permeable to rapidly permeable material.

Saffell soils have a dark grayish brown and yellowish brown gravelly silt loam surface layer and a reddish brown, loamy, gravelly to very gravelly, moderately permeable subsoil.

Of minor extent in this map unit are moderately well drained Lax soils on ridgetops throughout the unit and well drained Lexington soils on uplands near Kentucky Lake. Well drained Clifty gravelly silt loam and Nolin silt loam, moderately well drained Lindside silt loam, and somewhat poorly drained Newark silt loam are on first bottoms.

All of this map unit is in the Land-Between-the-Lakes area, which the Tennessee Valley Authority is developing as a national demonstration in outdoor recreation and environmental education. The soils in most of the unit are used as woodland and for extensive recreation activities, such as hunting, fishing, hiking, boating, and riding horses and off-the-road motor vehicles. In some areas, mostly along branches and creeks, the soils are cleared and planted to cultivated crops and pasture plants, which are used primarily as forage for wildlife.

The soils in this unit are poorly suited to cultivated crops and meadow crops because of the steepness of slope and the high content of gravel in the Saffell soils. They are suited to pasture plants, to woodland use, and to extensive recreation uses. Mainly because of the steepness of slope, they are poorly suited to urban uses and intensive recreation uses. The gravel in the Saffell soils is used for surfacing roads and for other construction work.

4. Nicholson-Hammack

Deep, gently sloping and sloping, moderately well drained and well drained soils formed in loess and cherty limestone residuum; on uplands

The soils in this map unit are on ridgetops and side slopes and in karst areas. Small areas are in the northern and southern parts of Lyon County and Trigg County.

This map unit makes up about 4 percent of Trigg County. It is about 58 percent Nicholson soils, 13 percent Hammack soils, and 29 percent soils of minor extent.

The Nicholson soils are moderately well drained. They are on broad ridgetops and the upper part of side slopes. They have a dark grayish brown to yellowish brown silt loam surface layer. The upper part of the subsoil is loamy and moderately permeable; and the lower part consists of a loamy, slowly permeable fragipan underlain by layers of clayey material.

The Hammack soils are well drained. They are on narrow ridges, and side slopes, and in karst areas. They have a brown silt loam surface layer. The subsoil is moderately permeable. It is loamy in the upper part and dominantly cherty and clayey in the lower part.

Of minor extent in this map unit are poorly drained Robertsville soils and somewhat poorly drained Lawrence soils on upland flats and in depressions and well drained Baxter soils in complex with Hammack soils on side slopes. Well drained Nolin soils, moderately well drained Lindside soils, and somewhat poorly drained Newark soils are on the first bottoms.

The soils of this map unit are used mostly for cultivated crops and hay and pasture. One area of this unit is in Fort Campbell, in the southern part of the county. Woodland is in some areas.

The soils in this map unit are well suited to cultivated crops, most specialty crops, and pasture and meadow crops. Wetness and the erosion hazard are limitations to the use of the soils as cropland, pasture, and meadow, but these limitations can be overcome by using good crop management practices and other erosion control measures. These soils are well suited to woodland use and extensive recreation uses. They are suited to urban uses and intensive recreation uses, but a seasonal perched water table and slow permeability caused by the fragipan in the Nicholson soils, the shrink-swell potential of the lower part of the subsoil of Hammack soils, and the slope are the main limitations to those uses.

5. Crider-Pembroke

Deep, gently sloping to sloping, well drained soils formed in loess and limestone residuum; on karst uplands

This map unit is in the northern and eastern parts of Trigg County. The soils are on broad ridges of the Meramec Series of Mississippian age, generally at an elevation of less than 490 feet.

This map unit makes up about 10 percent of Trigg County. It is about 61 percent Crider soils, 15 percent Pembroke soils, and 24 percent soils of minor extent.

The Crider soils are dominant on broad ridges and in undulating karst areas. These soils are well drained and are moderately permeable. They have a brown silt loam surface layer. The subsoil is loamy in the upper part and clayey in the lower part.

The Pembroke soils are on side slopes. Pembroke soils are well drained and are moderately permeable. They have a dark brown silt loam surface layer. The subsoil is loamy in the upper part and clayey in the lower part.

Of minor extent in this unit are well drained Nolin soils, moderately well drained Lindside soils, and somewhat poorly drained Newark soils in depressions and along drainageways. On uplands are well drained, moderately deep Fredonia soils, moderately well drained Nicholson soils, and well drained Hammack soils. Well drained Elk soils and moderately well drained Otwell soils are on stream terraces.

The soils in this map unit are used for growing cultivated crops and raising beef cattle. Nearly all of the acreage of this highly productive unit has been cleared. Most farmers grow only cash grain crops and tobacco. Some also raise beef cattle. Burley tobacco and dark-fired tobacco are grown on most farms, and dark air-cured tobacco is grown on some farms. The erosion hazard is the main limitation to farming.

The soils in this unit are well suited to cultivated crops, most specialty crops, hay and pasture plants, and trees. They are well suited to most urban uses and intensive recreation uses. Slope and the shrink-swell potential of the clayey part of the subsoil are the main limitations to those uses.

6. Hammack-Baxter-Nicholson

Deep, gently sloping to moderately steep, well drained and moderately well drained soils formed in loess and cherty limestone residuum or in cherty limestone residuum; on karst uplands

The soils in this map unit are on ridgetops, side slopes, and karst topography near Lake Barkley and the gently sloping Crider-Pembroke map unit.

This map unit makes up about 27 percent of Trigg County. It is about 37 percent Hammack soils, 15 percent Baxter soils, 13 percent Nicholson soils, and 35 percent soils of minor extent.

The gently sloping Hammack soils are dominant on ridgetops. The gently sloping to moderately steep Baxter soils are dominant on the lower part of side slopes adjacent to the valley floor. On side slopes and on the rim of depressions, the Hammack and Baxter soils are intermingled in a complex pattern. The Nicholson soils are on broad, gently sloping ridgetops and on the sloping upper part of side slopes.

The Baxter soils are moderately permeable and well drained. The surface layer is brown cherty silt loam. In eroded areas, it is cherty silty clay loam. The subsoil is dominantly clayey and cherty.

The Hammack soils are moderately permeable and well drained. The surface layer is brown silt loam. In eroded areas it is silty clay loam. The subsoil is loamy in the upper part and dominantly cherty and clayey in the lower part.

The Nicholson soils are moderately well drained. The surface layer is dark grayish brown to yellowish brown silt loam. The upper part of the subsoil is loamy and moderately permeable, and the lower part consists of a loamy, slowly permeable fragipan and, below that, layers of clayey material.

Of minor extent in this map unit are well drained Crider and Pembroke soils on uplands and well drained Elk soils on stream terraces. In depressions and on first bottoms along streams are well drained Nolin soils, moderately well drained Lindside soils, and somewhat poorly drained Newark soils.

The soils in this map unit are used for cultivated crops and for pasture and hay. There is some woodland, mainly in the steeper areas.

These soils are well suited to cultivated crops, specialty crops, and pasture and meadow crops. The hazard of erosion is the main limitation to the use of these soils as cropland, pasture, and meadowland. Because some slopes are irregular, the application of some erosion control measures is difficult. The soils are well suited to woodland use and to extensive recreation uses. In most areas they are suited to urban and intensive recreation uses, but the slow permeability and wetness in the Nicholson soils, the high clay content and shrink-swell potential of the Hammack and Baxter soils, and the slope are limitations.

7. Lax-Brandon

Deep, gently sloping to moderately steep, moderately well drained and well drained soils formed in loess and gravelly Coastal Plain material; on uplands

This map unit is in the Land-Between-the-Lakes area and in the southern part of Trigg County. Most of the acreage of this unit in southern Trigg County is in Fort Campbell.

This map unit makes up about 6 percent of Trigg County. It is about 54 percent Lax soils, 33 percent Brandon soils, and 13 percent soils of minor extent.

The Brandon soils are mostly on the steeper parts of the unit. They are well drained. The surface layer is brown silt loam except in severely eroded areas, where it

is silty clay loam. The loamy, moderately permeable subsoil is underlain by gravelly, loamy, moderately rapidly permeable to rapidly permeable material.

The Lax soils are on ridgetops and on the side slopes of the upper reach of branches. They are moderately well drained. The surface layer is brown silt loam except in severely eroded areas, where it is silty clay loam. The upper part of the subsoil is loamy and moderately permeable, and the lower part consists of a loamy, slowly permeable fragipan underlain by a gravelly clayey layer.

Of minor extent in this map unit are Nolin, Clifty, Lindside, and Newark soils on first bottoms and Saffell, Hammack, Baxter, and Lawrence soils on uplands. All these soils except Lindside, Newark, and Lawrence soils are well drained. The Lindside soils are moderately well drained and the Newark and Lawrence soils are somewhat poorly drained.

The soils of this map unit are used mostly for woodland and recreation in the Land-Between-the-Lakes area and for woodland and military training in Fort Campbell. In some areas they are cleared and used for cultivated crops and for pasture and meadow plants, some of which are left as forage for wildlife. In the small area of this unit that is in southern Trigg County but not in Fort Campbell the soils are used for cultivated crops and pasture and hay and as homesites.

These soils are suited to cultivated crops and well suited to pasture and meadow crops. The erosion hazard is the main limitation to the use of the soils as cropland, pasture, and meadowland. The soils are well suited to extensive recreation uses and are suited to woodland uses, urban uses, and intensive recreation uses; however, the steepness of the Brandon soils and a seasonal perched water table and slow permeability caused by the fragipan in the Lax soils are limitations to those uses.

8. Zanesville-Sadler-Fredonia

Deep to moderately deep, nearly level to sloping, well drained and moderately well drained soils formed in loess and sandstone and shale residuum or in limestone residuum; on uplands

This map unit is in the northeastern part of Trigg County. The soils formed in loess and mixed residuum of sandstone, shale, and limestone formations of the Chester Series of Mississippian age.

This map unit makes up about 2 percent of Trigg County. It is about 30 percent Zanesville soils, 20 percent Sadler soils, 15 percent Fredonia soils, and 35 percent soils of minor extent.

The Zanesville and Sadler soils are on broad ridges. The Zanesville soils are gently sloping and sloping, and the Sadler soils are nearly level to gently sloping. The Fredonia soils are gently sloping and sloping and are generally at lower elevations than the Zanesville and Sadler soils. They are intermingled in a complex pattern with Pembroke soils (fig. 5).

Zanesville soils are well drained to moderately well drained. The surface layer is brown silt loam. The upper part of the subsoil is loamy and moderately permeable. The lower part is a loamy fragipan that is moderately slowly permeable to slowly permeable.

Sadler soils are moderately well drained. The surface layer is brown silt loam. The upper part of the subsoil is loamy and moderately permeable. The lower part is a loamy fragipan that is slowly permeable.

Fredonia soils are well drained. The surface layer is reddish brown silt loam. The subsoil is dominantly clayey. Limestone bedrock is at a depth of about 30 inches.

Of minor extent in this map unit are deep, well drained Pembroke, Crider, and Hagerstown soils; somewhat poorly drained Lawrence soils; and poorly drained Robertsville soils. These soils are on the uplands. Well drained Nolin soils and moderately well drained Lindside soils are on first bottoms, and well drained Elk soils and moderately well drained Otwell soils are on stream terraces.

The soils in this unit are used for corn, soybeans, and burley and dark tobacco. In some areas they are used for pasture and hay in rotation, and in some areas they are used as woodland.

These soils are well suited to cultivated crops, most specialty crops, and pasture and hay. The hazard of erosion and the wetness caused by a seasonal perched water table are the main limitations to the use of the soils as cropland, pasture, and hayland.

The soils are well suited to woodland use and extensive recreation uses. They are suited to intensive recreation uses and urban uses. The slow permeability and wetness caused by the fragipan in the Zanesville and Sadler soils are limitations to those uses. The high clay content, the shrink-swell potential of the subsoil, and the depth to bedrock of the Fredonia soils are additional limitations.

9. Hagerstown-Fredonia-Frondorf

Deep and moderately deep, moderately steep to sloping, well drained soils formed in dominantly clayey limestone residuum or in loamy sandstone and shale residuum with some loess; on uplands

This map unit is in the northeastern part of Trigg County. The soils formed in loess and residuum of mixed limestone, shale, or sandstone formations of the Chester Series of Mississippian age. The elevation ranges from 510 feet near Buffalo to 813 feet on Buie Knob.

This map unit makes up about 1 percent of Trigg County. It is about 39 percent Hagerstown soils, 19 percent Fredonia soils, 12 percent Frondorf soils, and 30 percent soils of minor extent.

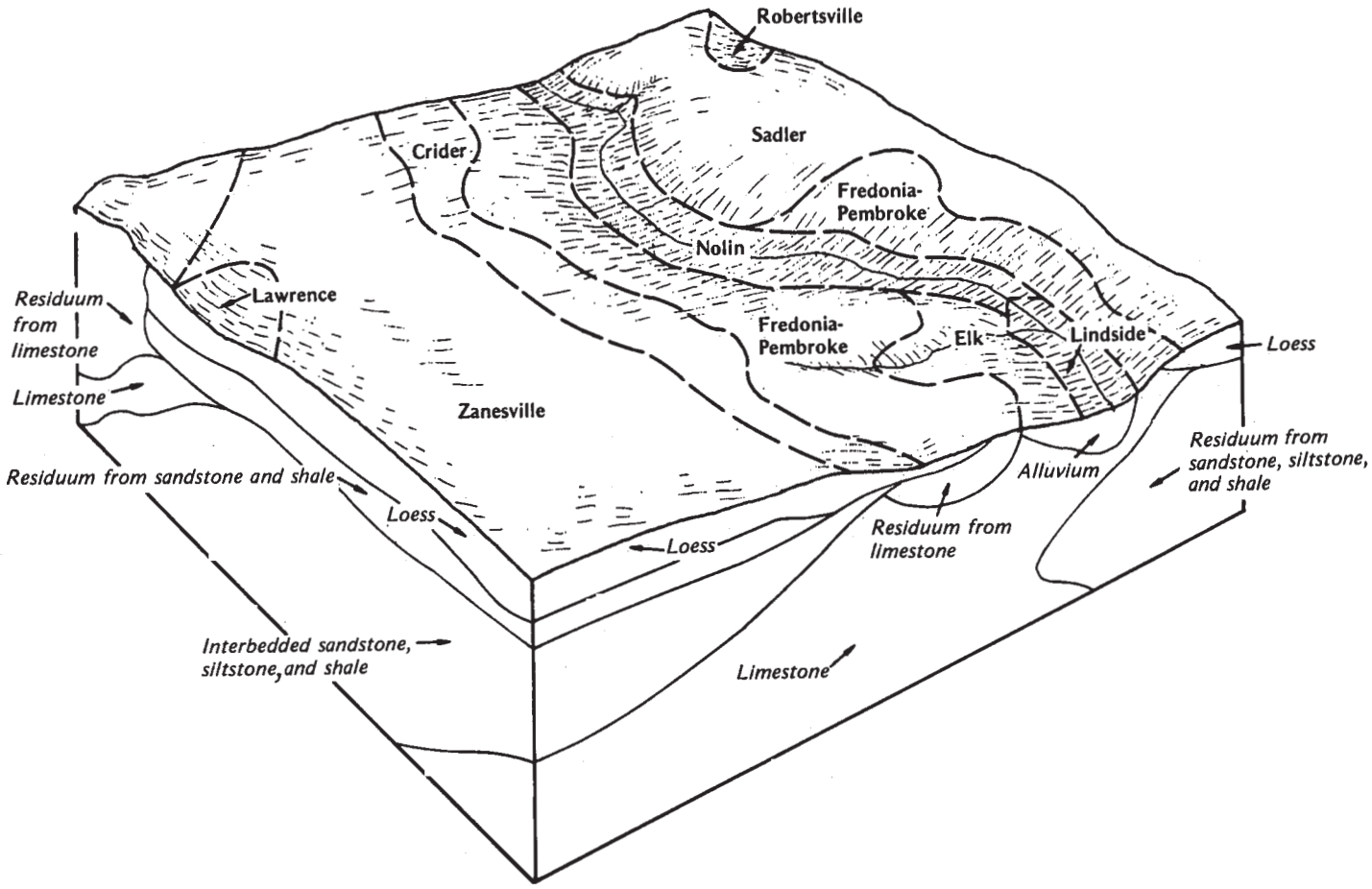


Figure 5.—Typical pattern of soils and underlying material in the Zanesville-Sadler-Fredonia map unit.

The Hagerstown and Fredonia soils are intermingled in a complex pattern. The Hagerstown soils are on narrow ridgetops and side slopes (fig. 6). The Fredonia soils are intermingled with outcrops of limestone. The Frondorf soils are intermingled in a complex pattern with shallow Weikert soils and deep, well drained Wellston soils in areas of sandstone and shale. The Frondorf, Weikert, and Wellston soils are generally at a higher elevation than the Hagerstown and Fredonia soils.

Hagerstown soils are deep. They are moderately permeable. They have a brown silt loam surface layer and a dominantly clayey subsoil.

Fredonia soils are moderately deep. They are moderately slowly permeable to slowly permeable. They have a brown to reddish brown silt loam surface layer and a clayey subsoil. Limestone bedrock is at a depth of about 30 inches.

Frondorf soils are moderately deep. They are moderately permeable. They have a very dark gray to yellowish brown silt loam surface layer and a loamy subsoil that has sandstone fragments in the lower part. Sandstone bedrock is at a depth of about 29 inches.

Of minor extent in this map unit are Weikert and Wellston soils, which are intermingled with the Frondorf soils, and Zanesville, Nicholson, and Sadler soils. Limestone rock outcrop occurs with the Fredonia soils. Nolin, Lindside, and Newark soils are on the small bottoms.

The soils in this unit are used mainly as woodland and wildlife habitat. Only a small acreage, mostly on narrow ridges and toe slopes, is cleared.

The soils in this map unit are poorly suited to cultivated crops, most specialty crops, and meadow crops. The steepness of slope, the erosion hazard, the moderate depth to rock, and the rock outcrops are the main limitations. The soils are suited to pasture. They are poorly suited to urban uses and intensive recreation uses, mainly because of the steepness of slope, the depth to bedrock, and the shrink-swell potential. They are well suited to woodland use and to extensive recreation uses.

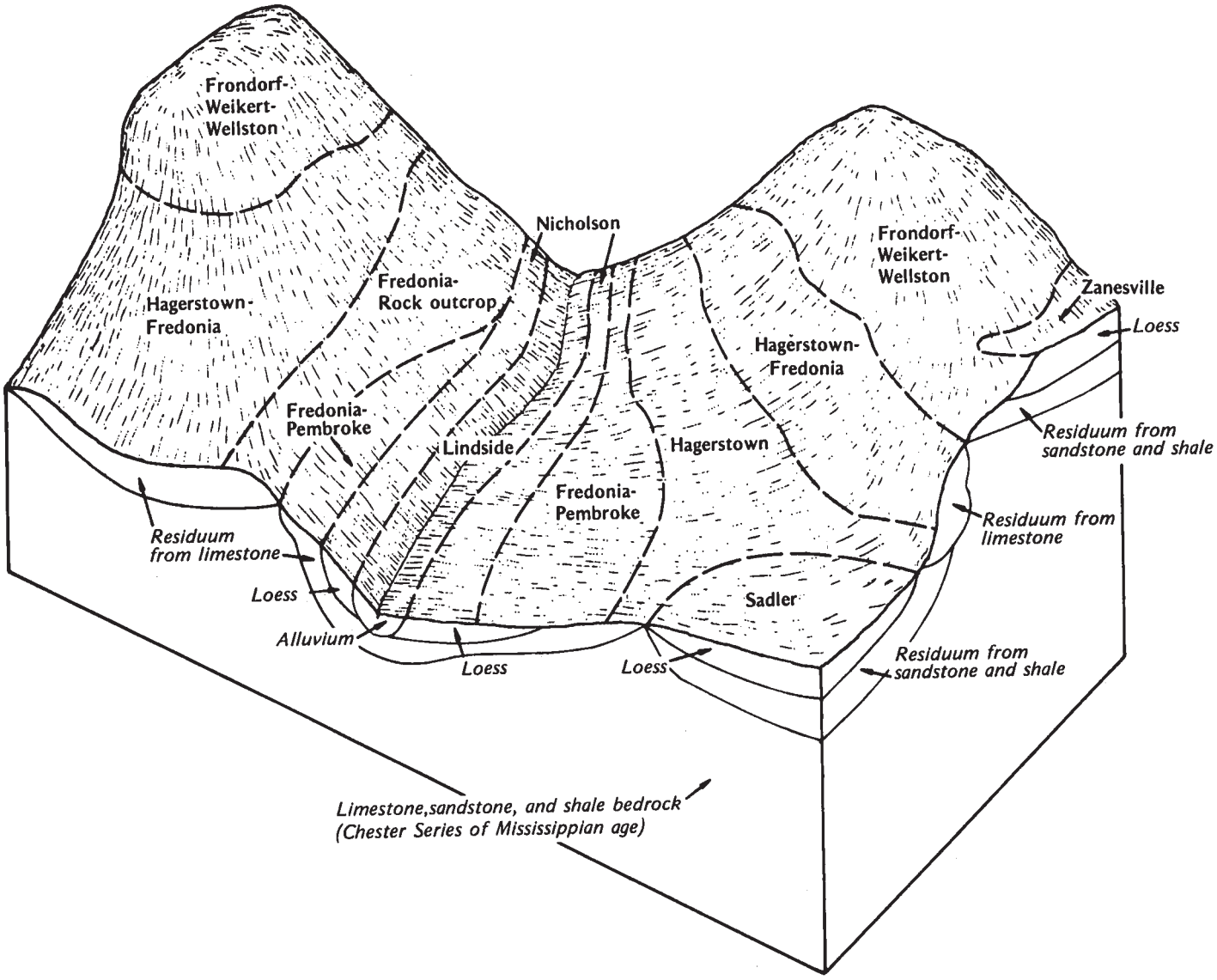


Figure 6.—Typical pattern of soils and underlying material in the Hagerstown-Fredonia-Frondorf map unit.

detailed soil map units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under "Use and management of the soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Brandon silt loam is one of several phases in the Brandon series.

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

A *soil complex* consists of two or more soils in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Brandon-Saffell complex is an example.

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

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

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

soil descriptions

BaE—Baxter-Hammack complex, 20 to 30 percent slopes. This complex consists of small areas of steep Baxter and Hammack soils that are so intermingled that they cannot be mapped separately at the scale used. These soils are deep and well drained. They are along tributaries of the Cumberland River within a few miles of Lake Barkley. Some areas are along streams near Kentucky Lake, and a few areas are around deep, cavernous sinkholes. Areas of this complex generally range from 10 to 70 acres. Areas of each soil generally range between 1 and 3 acres.

Baxter cherty silt loam makes up approximately 50 percent of each mapped area. Typically, the surface layer is brown cherty silt loam about 10 inches thick. The subsoil to a depth of 18 inches is red silty clay loam that is about 5 percent chert. From 18 to 95 inches it is red or dark red cherty or very cherty silty clay or clay.

This Baxter soil is medium in natural fertility. Reaction ranges from strongly acid to very strongly acid except where the surface layer has been limed. The root zone is deep, permeability is moderate, and the available water capacity is high. The surface layer is moderate in content of organic matter. It has fair tilth because of the content of chert fragments. The shrink-swell potential is moderate.

Hammack silt loam makes up approximately 30 percent of each mapped area. Typically, the surface layer is brown silt loam about 6 inches thick. The subsoil to a depth of 25 inches is strong brown silty clay loam. From 25 to 30 inches it is mottled reddish brown and brown very cherty silt loam. From 30 to 94 inches it is dark red or dark reddish brown clay that contains a few chert fragments in some parts and is as much as 55 percent chert in other parts.

This Hammack soil is medium to high in natural fertility. Reaction ranges from medium acid to very

strongly acid except where the surface layer has been limed. Permeability is moderate, the root zone is deep, and the available water capacity is high. The surface layer is moderate in content of organic matter and has good tilth. The lower part of the subsoil has moderate shrink-swell potential.

Included in mapping are Nolin, Lindside, and Newark soils on first bottoms along small drainageways. A few severely eroded areas are also included. Limestone bedrock outcrops on the lower part of some slopes. On the maps, these outcrops are indicated by a special symbol if they cover more than 20 square feet. Additional symbols are used for each 300 linear feet of exposed limestone. Also included are narrow ridgetops that generally are areas of Hammack and Baxter soils, but in some places are areas of Brandon, Lax, and Nicholson soils. On the steep upper parts of side slopes in places are small areas of Brandon and Saffell soils. The inclusions generally make up about 20 percent of the complex. The area of each inclusion is generally less than 3 acres.

On most of the acreage, these soils are used as woodland. In some areas they are used as pasture. Recreation is an important use in the Land-Between-the-Lakes area.

These soils are suited to pasture. They are poorly suited to cultivated crops. The steepness of slope and a very severe hazard of erosion are the main limitations. Seeding pasture late in summer and early in fall, which are normally dry periods, generally prevents excessive erosion. Renovation of old stands of pasture without plowing is desirable. Rotation grazing and maintaining high fertility levels help to maintain good stands, increase yields, and control erosion.

These soils are well suited to woodland use. The main management concerns are the hazard of erosion, equipment limitations, and plant competition. The Hammack soil is suited to yellow-poplar, black walnut, shortleaf pine, loblolly pine, and Virginia pine. The Baxter soil is suited to eastern white pine, loblolly pine, shortleaf pine, black locust, and yellow-poplar.

These soils have fair potential for use as habitat for openland wildlife and good potential for use as habitat for woodland wildlife.

These soils are poorly suited to most urban and intensive recreation uses mainly because of the steepness of slope.

This complex is in capability subclass VIe and woodland suitability group 2r.

BaF—Baxter-Hammack complex, 30 to 60 percent slopes. This complex consists of small areas of very steep Baxter and Hammack soils that are so intermingled that they cannot be mapped separately at the scale used. These soils are deep and well drained. They are along tributaries of the Cumberland River within a few miles of Lake Barkley. Some areas are along streams near Kentucky Lake, and a few areas are around deep cavernous sinkholes. Areas of this complex generally range from 5 to 50 acres. Areas of each soil generally range from 1 to 3 acres.

Baxter cherty silt loam makes up approximately 70 percent of each mapped area. Typically, the surface layer is brown cherty silt loam about 10 inches thick. The subsoil to a depth of 18 inches is red silty clay loam that is about 5 percent chert. From 18 to 95 inches it is red or dark red cherty or very cherty silty clay or clay.

This Baxter soil is medium in natural fertility. Reaction ranges from strongly acid to very strongly acid except where the surface layer has been limed. The root zone is deep, permeability is moderate, and the available water capacity is high. The surface layer is moderate in content of organic matter. It has fair tilth because of the content of chert fragments. The shrink-swell potential is moderate.

Hammack silt loam makes up approximately 20 percent of each mapped area. Typically, the surface layer is brown silt loam about 6 inches thick. The subsoil to a depth of 25 inches is strong brown silty clay loam. From 25 to 30 inches it is mottled reddish brown and brown very cherty silt loam. From 30 to 94 inches it is dark red or dark reddish brown clay that contains a few chert fragments in some parts and is as much as 55 percent chert in other parts.

This Hammack soil is medium to high in natural fertility. Reaction ranges from medium acid to very strongly acid throughout except where the surface layer has been limed. Permeability is moderate, the root zone is deep, and the available water capacity is high. The surface layer is moderate in content of organic matter and has good tilth. The shrink-swell potential is moderate in the lower part of the subsoil.

Included in mapping are Nolin, Lindside, and Newark soils on first bottoms along small drainageways. A few severely eroded areas are also included. Limestone bedrock outcrops on the lower part of some slopes. On the map, these outcrops are indicated by a special symbol if they cover more than 20 square feet. Additional symbols are used for each 300 linear feet of exposed limestone. Also included are narrow ridgetops that generally are areas of Hammack and Baxter soils but in some places are areas of Brandon, Lax, and Nicholson soils. On the steep upper part of side slopes in places are small areas of Brandon and Saffell soils. The inclusions generally make up about 10 percent of the complex. The area of each inclusion is generally less than 3 acres.

On most of the acreage these soils are used as woodland. In some areas they are used as pasture. Extensive recreation is an important use in the Land-Between-the-Lakes area.

These soils are poorly suited to pasture and cultivated crops. The steepness of slope and a very severe erosion hazard are the main limitations.

These soils are well suited to woodland use. Equipment limitations, erosion hazard, and plant

competition are the main concerns of management. The Baxter soil is suited to eastern white pine, loblolly pine, shortleaf pine, black locust, and yellow-poplar. The Hammack soil is suited to yellow-poplar, black walnut, shortleaf pine, loblolly pine, and Virginia pine.

The potential of these soils for use as habitat for woodland wildlife is good.

These soils are poorly suited to urban and intensive recreation uses mainly because of the steepness of slope.

This complex is in capability subclass VIIe and woodland suitability group 2r.

BrC—Brandon silt loam, 6 to 12 percent slopes. This is a deep, well drained, sloping soil. It is on ridgetops and the upper part of side slopes at elevations mostly above 570 feet. It is between Barkley and Kentucky Lakes and in the southern part of Trigg County, east of Barkley Lake. Most areas are 25 to 100 acres.

Typically, the surface layer consists of a layer of brown silt loam 1 inch thick and a layer of yellowish brown silt loam 7 inches thick. The subsoil to a depth of 12 inches is strong brown silt loam. From 12 to 28 inches it is yellowish red silty clay loam. From 28 to 72 inches it consists of layers of strong brown, brown, or yellowish red gravelly or very gravelly silty clay loam, clay loam, or sandy loam.

This soil is medium in natural fertility and low in content of organic matter. Permeability is moderate to a depth of 28 inches and moderately rapid or rapid in the very gravelly strata below that depth. Reaction ranges from strongly acid to very strongly acid in unlimed areas. The available water capacity is high. Tilth is good, and the soil can be worked throughout a wide range in moisture content. The root zone is deep and is easily penetrated by the roots. The very gravelly lower horizons, however, provide little food or water for plants.

Included in mapping are small areas of Lax and Saffell soils on the uplands and small areas of Clifty, Nolin, and other alluvial soils along natural drainageways. The included soils make up about 5 to 10 percent of the map unit. Individual areas are generally less than 3 acres.

Most of the acreage of this soil is in woodland on narrow ridgetops. Hardwoods such as oak, hickory, and blackgum are on most of the acreage that has not been cleared. Areas that have been cleared are reforested with sassafras, persimmon, elm, dogwood, and sumac. Loblolly and shortleaf pine have been planted in a few small areas. Much of the acreage is in the Land-Between-the-Lakes area and is used for recreation. In small areas throughout the survey area the soil is used for cultivated crops and for pasture and hay. In the cleared areas in the Land-Between-the-Lakes area and in Fort Campbell the soil is planted primarily to crops used as food for wildlife.

This soil is suited to most of the cultivated crops common to the survey area if erosion control practices are applied. It is well suited to use as pasture.

This soil is well suited to use as woodland. Plant competition is the main concern of management. Virginia pine, shortleaf pine, and loblolly pine can grow on this soil.

The potential of this soil for use as habitat for openland and woodland wildlife is good.

This soil is suited to most urban and recreation uses, but it is limited for those uses mainly by the steepness of slope.

This map unit is in capability subclass IIIe and woodland suitability group 3o.

BrD—Brandon silt loam, 12 to 20 percent slopes. This is a deep, well drained, moderately steep soil. It is on the upper part of side slopes at elevations mostly above 500 feet. Most areas are 20 to 80 acres. Most of the acreage is between Barkley and Kentucky Lakes and in the southern part of Trigg County, east of Barkley Lake.

Typically, the surface layer consists of a layer of brown silt loam 1 inch thick and a layer of yellowish brown silt loam 7 inches thick. The subsoil to a depth of 12 inches is strong brown silt loam. From 12 to 28 inches it is yellowish red silty clay loam. From 28 to 72 inches it consists of layers of strong brown, brown, or yellowish red gravelly or very gravelly silty clay loam, clay loam, or sandy loam.

This soil is medium in natural fertility and low in content of organic matter. Permeability is moderate to a depth of 28 inches and moderately rapid or rapid in the very gravelly strata below that depth. Reaction is strongly acid or very strongly acid throughout in unlimed areas. The available water capacity is high. Tilth is good and the soil can be worked throughout a wide range in moisture content. The root zone is deep and is easily penetrated by the roots. The very gravelly lower horizons, however, provide little food or water for plants.

Included in mapping are small areas of Lax and Saffell soils on the uplands and small areas of Clifty, Nolin, and other alluvial soils along natural drainageways. The included soils make up about 5 to 10 percent of the map unit. Individual areas are generally less than 3 acres.

Most of the acreage of this soil is in woodland on narrow ridgetops. Much of the acreage is in the Land-Between-the-Lakes area and is used for recreation. Hardwoods such as oak, hickory, and blackgum are on most of the acreage that has not been cleared. Areas that have been cleared are reforested with sassafras, persimmon, elm, dogwood, and sumac. Loblolly and shortleaf pine have been planted in a few small areas. In small areas throughout the survey area the soil is used for cultivated crops and for pasture and hay. In the cleared areas in the Land-Between-the-Lakes area and in Fort Campbell the soil is planted primarily to crops used as food for wildlife.

This soil is suited to most pasture and hay crops in the survey area if erosion control practices are applied. It is poorly suited to cultivated crops because of the steepness of slope and a very severe hazard of erosion.

This soil is suited to woodland use. Trees commonly grow more rapidly on the cool slopes than they do on the hot slopes. The main concerns of management are equipment limitations and the hazard of erosion. Plant competition is a limitation on the north aspect and seedling mortality is a limitation on the south aspect. Virginia pine, shortleaf pine, and loblolly pine can grow on this soil.

This soil has good potential for use as habitat for woodland wildlife and fair potential for use as habitat for openland wildlife.

This soil is poorly suited to most urban uses and to intensive recreation uses mainly because of the steepness of slope.

This map unit is in capability subclass VIe and in woodland group 3r (north aspect), 4r (south aspect).

BsC3—Brandon silty clay loam, 6 to 12 percent slopes, severely eroded. This is a deep, well drained, sloping soil. It is on the upper part of side slopes. The plow layer is mostly subsoil material. Many areas have rills and gullies. Most areas are 5 to 20 acres. Most of the acreage is between Barkley and Kentucky Lakes and in the southern part of Trigg County, east of Lake Barkley.

Typically, the surface layer is brown silty clay loam about 4 inches thick. The subsoil to a depth of 8 inches is strong brown silty clay loam. From 8 to 24 inches it is yellowish red silty clay loam. From 24 to 72 inches it consists of layers of strong brown, brown, or yellowish red gravelly or very gravelly silty clay loam, clay loam, or sandy loam.

Natural fertility and content of organic matter are low. Permeability is moderate to a depth of 24 inches and moderately rapid or rapid in the very gravelly strata below that depth. Reaction is strongly acid to very strongly acid throughout in unlimed areas. The available water capacity is high. Sometimes a crust forms on the surface, and as a result a low percentage of seeds germinate and a low percentage of seedlings survive. The root zone is deep and is easily penetrated by the roots. The very gravelly lower horizons, however, provide little food or water for plants. The silty clay loam texture of the surface layer makes tillage somewhat difficult.

Included in mapping are small areas of Lax and Saffell soils on the uplands and small areas of Clifty, Nolin, and other alluvial soils along natural drainageways. The included soils make up about 5 to 10 percent of the map unit. Individual areas are generally less than 3 acres.

Most of the acreage of this soil was cleared but has reverted to woodland. In some areas this soil is used for pasture and hay, and in a few areas it is cultivated. Some areas are reforested with sassafras, persimmon, elm, dogwood, and sumac. Loblolly and shortleaf pine have been planted in a few small areas. Much of the acreage is in the Land-Between-the-Lakes area and is used for extensive recreation.

This soil is poorly suited to cultivated crops because of previous erosion and a very severe hazard of further erosion. It is suited to occasional use as cultivated cropland if adequate measures are taken to control erosion. It is better suited to pasture and hay crops. Most pasture and hay plants can be grown on this soil. Obtaining and maintaining stands of pasture plants that provide adequate forage and control erosion are the main concerns of management.

This soil is suited to woodland use. The main concern of management is plant competition. Virginia pine, shortleaf pine, and loblolly pine can grow on this soil.

This soil is suited to use as habitat for openland and woodland wildlife.

This soil is suited to urban uses and to intensive recreation uses. The main limitation to these uses is the steepness of slope.

This map unit is in capability subclass IVe and woodland suitability group 3o.

BsD3—Brandon silty clay loam, 12 to 25 percent slopes, severely eroded. This is a deep, well drained, moderately steep to steep soil. It is on side slopes. The plow layer is mostly subsoil material, and many areas have rills and gullies. Most areas are 5 to 30 acres. Most of the acreage is between Lake Barkley and Kentucky Lake and in the southern part of Trigg County, east of Lake Barkley.

Typically, the surface layer is brown silty clay loam about 4 inches thick. The subsoil to a depth of 8 inches is strong brown silty clay loam. From 8 to 24 inches it is yellowish red silty clay loam. From 24 to 72 inches it consists of layers of strong brown, brown, or yellowish red gravelly or very gravelly silty clay loam, clay loam, or sandy loam.

Natural fertility and content of organic matter are low. Permeability is moderate to a depth of 24 inches and moderately rapid or rapid in the very gravelly strata below that depth. Reaction is strongly acid to very strongly acid throughout except where the surface layer has been limed. The available water capacity is high. Sometimes a crust forms on the surface, and as a result a low percentage of seeds germinate and a low percentage of seedlings survive. The root zone is deep and is easily penetrated by the roots. The very gravelly lower horizons, however, provide little food or water for plants. The surface layer is somewhat difficult to work because of the silty clay loam texture.

Included in mapping are small areas of Lax and Saffell soils on the uplands and small areas of Clifty, Nolin, and other alluvial soils along natural drainageways. The included soils make up about 5 to 10 percent of the map unit. Individual areas are generally less than 3 acres.

Most of the acrage of this soil was cleared but has reverted to woodland. Some areas are reforested with sassafras, persimmon, elm, dogwood, and sumac. Loblolly and shortleaf pine have been planted in a few small areas. In some areas this soil is used for pasture and hay, and in a few areas it is cultivated. Much of the acreage is in the Land-Between-the-Lakes area and is used for extensive recreation.

This soil is poorly suited to cultivated crops because of the steepness of slope, the previous erosion, and the hazard of further erosion. It is better suited to pasture and hay crops. Most of the commonly grown pasture and hay plants can grow on this soil. Obtaining and maintaining stands of pasture plants that provide adequate forage and control erosion are the main concerns of management.

This soil is suited to woodland use. Trees commonly grow more rapidly on the cool slopes than on the hot slopes. The erosion hazard, equipment limitations, and seedling mortality are the main concerns of management. Virginia pine, shortleaf pine, and loblolly pine can grow on this soil.

The potential is good for woodland wildlife habitat and fair for openland wildlife habitat.

This soil is poorly suited to urban uses and intensive recreation uses. The steepness of slope is a severe limitation to these uses. In some areas of this soil, the gravelly lower layers are mined for use in road construction.

This map unit is in capability subclass VIIe and woodland suitability groups 3r (north aspect) and 4r (south aspect).

BxE—Brandon-Saffell complex, 20 to 50 percent slopes. This complex consists of small areas of steep and very steep Brandon and Saffell soils that are so intermingled that they could not be mapped separately at the scale used. These soils are deep and well drained. The Brandon soils are mostly on east- and north-facing slopes. The Saffell soils are mostly on south- and west-facing slopes. This complex is in highly dissected areas in the Land-Between-the-Lakes, east of Barkley Lake in the southern part of Trigg County, and in Lyon County, east and north of Barkley Lake.

The Brandon soils make up 50 percent of each mapped area. Typically, the surface layer consists of a layer of brown silt loam 1 inch thick and a layer of yellowish brown silt loam 7 inches thick. The subsoil to a depth of 12 inches is strong brown silt loam. From 12 to 28 inches it is yellowish red silty clay loam. From 28 to 72 inches it consists of layers of strong brown, brown, or yellowish red gravelly or very gravelly silty clay loam, clay loam, or sandy loam.

The Brandon soils are medium in natural fertility and low in content of organic matter. Permeability is moderate to a depth of 28 inches and moderately rapid or rapid in the very gravelly strata below that depth. The available water capacity is high. Reaction is strongly acid to very strongly acid in limed areas. Tilth is good, and the soil can be worked throughout a wide range in moisture content. The root zone is deep and is easily penetrated by the roots. The very gravelly lower horizons, however, provide little food or water for plants.

The Saffell soils make up 40 percent of each mapped area. Typically, the surface layer consists of a layer of dark grayish brown gravelly silt loam 2 inches thick and a layer of yellowish brown gravelly silt loam 4 inches thick. The subsoil to a depth of 15 inches is strong brown gravelly loam. From 15 to 27 inches it is reddish brown very gravelly clay loam. From 27 to 44 inches it is strong brown very gravelly clay loam, and from 44 to 70 inches it is strong brown very gravelly sandy clay loam.

The Saffell soils are medium in natural fertility and low in content of organic matter. They are strongly acid. Permeability and the available water capacity are moderate. The gravel in the surface layer dulls tillage implements and makes tillage difficult. The root zone is deep and is easily penetrated by the roots. The very gravelly lower horizons, however, provide little food or water for plants.

Included in mapping are small areas of Baxter, Hammack, and Lax soils on uplands and Clifty, Nolin, and other alluvial soils along natural drainageways. Also included are small areas where the horizons below a depth of 30 inches formed in reddish sandy loam or sandy clay loam. In some areas the soil contains gravelly material cemented by iron and managanese compounds. The included soils make up about 5 to 10 percent of the complex. The individual areas are generally less than 3 acres.

On most of the acreage the soils are used as woodland. In the Land-Between-the-Lakes area they are also used for extensive recreation and as wildlife habitat. In a few areas they are used as pasture. Loblolly and shortleaf pine have been planted in a few small areas. In small areas east of Lake Barkley the soils are used as sites for cabins.

These soils are poorly suited to cultivated crops and to hay and pasture mainly because of the steepness of slope and a very severe hazard of erosion.

These soils are suited to woodland use. The erosion hazard, equipment limitation, seedling mortality, and plant competition are the main concerns of management. The Brandon soils are suited to Virginia pine, shortleaf pine, and loblolly pine. The Saffell soils are suited to loblolly pine, Virginia pine, shortleaf pine, and eastern redcedar.

The Brandon soils have good potential for use as habitat for woodland wildlife. The Saffell soils have fair potential for this use.

These soils are poorly suited to urban uses and to intensive recreation uses mainly because of the steepness of slope.

This complex is in capability subclass VIIe. The Brandon soils are in woodland suitability groups 3r (north aspect) and 4r (south aspect). The Saffell soils are in woodland suitability group 4f.

Cp—Clifty gravelly silt loam. This is a deep, well drained, nearly level, gravelly soil. It is near the head of branch bottoms and near creeks. Areas of this map unit are irregular in shape. Most areas range from 15 to 60 acres in size. The slope range is 0 to 2 percent.

Typically, the surface layer is brown gravelly silt loam about 6 inches thick. The subsoil, extending to a depth

of 34 inches, is brown gravelly silt loam. The underlying material is brown very gravelly loam between depths of 34 and 50 inches and light gray gravelly clay loam between depths of 50 and 60 inches.

This soil is moderately rapidly permeable. It is very strongly acid to medium acid and is medium in natural fertility. The gravelly surface is moderate in content of organic matter and is friable, but it is somewhat difficult to till and dulls tillage implements. The root zone is deep. The available water capacity is moderate, and droughts often reduce crop yields. In winter and early in spring, this soil is subject to occasional, brief periods of flooding.

Included in mapping are areas of soils that are not gravelly. These soils make up 15 to 35 percent of most delineations. Also included are small areas of Nolin and Lindside soils and of a gravelly soil that is slightly acid to mildly alkaline.

In many areas this soil is used as hardwood forest. In some areas it is farmed. In some areas it is used as pasture and for meadow crops.

This soil is suited to cultivated crops and to hay and pasture. It is suited to most of the crops commonly grown in the survey area. Flooding in winter and early in spring can damage some crops. Erosion is not a hazard on this soil, and if good management practices are used the soil can be cultivated year after year.

This soil is well suited to woodland use. Plant competition is the main concern of management. Yellow-poplar, sweetgum, white ash, eastern cottonwood, shortleaf pine, eastern white pine, and cherrybark oak can grow on this soil.

This soil has good potential for use as habitat for openland and woodland wildlife.

This soil is poorly suited to urban development because of the hazard of flooding. The suitability of this soil for recreation uses is fair because of the hazard of flooding and the high content of gravel in the surface layer.

This map unit is in capability subclass IIs and woodland suitability group 1o.

CrA—Crider silt loam, 0 to 2 percent slopes. This is a nearly level, deep, well drained soil that is on ridgetops. Most of the acreage is in the eastern part of Trigg County. Areas range from about 10 to 40 acres.

Typically, the surface layer is brown, friable silt loam about 8 inches thick. The subsoil to a depth of 24 inches, is brown silty clay loam. From 24 to 54 inches it is yellowish red to red silty clay loam. From 54 to 66 inches it is dark red silty clay.

This soil is easy to till. It is moderate in content of organic matter and high in natural fertility. It is medium acid to strongly acid in unlimed areas. Permeability is moderate, and the available water capacity is high. The root zone is deep. The lower part of the subsoil has a moderate shrink-swell potential.

Included in mapping are small areas of Pembroke and Nicholson soils.

On most of the acreage this soil is used for row crops and hay and pasture in rotation. In small areas it is used as woodland.

This soil is well suited to row crops and meadow and pasture plants. It is one of the most productive soils in the area, and it is well suited to all of the commonly grown crops including alfalfa, barley, corn, burley tobacco, dark tobacco, red clover, soybeans, wheat, and lespedeza. Erosion is not a hazard, and this soil is suited to continual cultivation if a high level of management—one that maintains the content of organic matter and the good tilth—is used.

This soil is well suited to woodland use. Seeds, cuttings, and seedlings grow well if competing plants are controlled. Yellow-poplar, black walnut, white ash, northern red oak, eastern white pine, and loblolly pine grow well on this soil.

The potential of this soil for use as habitat for openland and woodland wildlife is good.

This soil is well suited to most urban uses.

This map unit is in capability class I and woodland suitability group 1o.

CrB—Crider silt loam, 2 to 6 percent slopes. This is a gently sloping, deep, well drained soil. It is on broad ridges in the eastern part of Trigg County and in the northern part of Lyon County. Most areas range from 10 to 80 acres.

Typically, the surface layer is brown, friable silt loam 8 inches thick. The subsoil to a depth of 24 inches is brown silty clay loam. From 24 to 54 inches it is yellowish red to red silty clay loam. From 54 to 66 inches it is dark red silty clay.

This soil is moderate in content of organic matter and high in natural fertility. It is medium acid or strongly acid in unlimed areas. Permeability is moderate, and the available water capacity is high. The response of plants to lime and fertilizer is good. This soil has good tilth and can be worked throughout a wide range in moisture content. The root zone is deep. The lower part of the subsoil has moderate shrink-swell potential.

Included in mapping are Pembroke soils, which make up as much as 20 percent of some mapped areas. Included in many areas are Nolin and Lindside soils in small basins. Some mapped areas contain small areas of Fredonia, Hammack, and Nicholson soils.

On most of the acreage this soil is used for row crops and hay and pasture in rotation. In small areas it is used as woodland.

This soil is well suited to row crops and small grain. It is one of the more productive soils in the survey area. It is well suited to all the commonly grown crops such as corn, soybeans, and burley and dark tobacco. The hazard of erosion is moderate; therefore, erosion control practices are needed if the soil is cultivated.

This soil is suited to hay and pasture. Deep-rooted crops grow well, and high yields are obtained from pasture and hay crops under good management.

Rotation to hay or pasture fits well in a system with grain crops. It helps to control erosion and maintain the content of organic matter and the good tilth.

This soil is well suited to woodland use. Seeds, cuttings, and seedlings grow well if competing plants are controlled. Yellow-poplar, black walnut, white ash, northern red oak, eastern white pine, and loblolly pine can grow on this soil.

The potential of this soil for use as habitat for openland and woodland wildlife is good.

This soil is well suited to most urban uses and to intensive recreation uses. The steepness of slope and the clayey texture of the lower part of the subsoil are limitations to some uses.

This map unit is in capability subclass IIe and woodland suitability group 1o.

CsC—Crider-Pembroke silt loams, 6 to 12 percent slopes. This complex consists of small areas of Crider and Pembroke soils that are so intermingled that they could not be mapped separately at the scale used. These soils are deep, well drained, and sloping and generally have karst topography. They are mostly on side slopes, but in many areas a substantial acreage is on small ridgetops.

The Crider soil makes up about 60 percent of each mapped area. Typically, the surface layer is brown, friable silt loam about 8 inches thick. The subsoil to a depth of 24 inches is brown silty clay loam. From 24 to 54 inches it is yellowish red to red silty clay loam. From 54 to 66 inches it is dark red silty clay.

The Crider soil is easy to till. It is moderate in content of organic matter and high in natural fertility. It is medium acid or strongly acid unless limed. Permeability is moderate, and the available water capacity is high. The root zone is deep. The plow layer has good tilth and can be worked throughout a wide range in moisture content. The lower part of the subsoil has moderate shrink-swell potential.

The Pembroke soil makes up about 30 percent of each mapped area. Typically, the surface layer is dark brown silt loam about 6 inches thick. The subsoil to a depth of 34 inches is reddish brown silty clay loam. From 34 to 46 inches it is red silty clay. From 46 to 75 inches it is dark red clay.

The Pembroke soil is moderate in content of organic matter and high in natural fertility. It is medium acid or very strongly acid unless limed. Permeability is moderate, and the available water capacity is high. The root zone is deep. The plow layer has good tilth and can be worked throughout a wide range in moisture content. The lower part of the subsoil is moderate in shrink-swell potential.

Included in nearly all areas of this complex are small areas of Nolin and Lindside soils in small basins or depressions. Small areas of Fredonia, Hammack, Nicholson, and Newark soils are included in a few areas of this complex.

In most areas of this complex the soils are used for cultivated crops or hay and pasture in rotation. In some areas they are used for urban development. In small areas they are used as woodland.

The soils in this complex are suited to cultivated crops. They are well suited to the crops commonly grown in the area. The hazard of erosion is severe, and conservation practices are needed to reduce soil loss if row crops are grown. Because slopes are irregular, planting on the contour is difficult.

These soils are well suited to pasture and hay crops, including deep-rooted crops. The pasture or hay crops fit well into a rotation with grain crops. They help to control erosion and to maintain the content of organic matter and the good tilth.

These soils are well suited to use as woodland. Controlling plant competition is needed to establish seedlings in open fields. The Crider soil is suited to eastern white pine, yellow-poplar, black walnut, loblolly pine, and white ash. The Pembroke soil is suited to yellow-poplar, black walnut, white ash, eastern white pine, shortleaf pine, and loblolly pine.

These soils are suited to most urban uses and to intensive recreation uses. The steepness of slope and the high content of clay in the lower part of the subsoil are the main limitations to these uses. On many small ridgetops the slope limitation is slight.

The soils in this complex have good potential for use as habitat for woodland wildlife.

This complex is in capability subclass IIIe and woodland suitability group 1o.

ElA—Elk silt loam, 0 to 2 percent slopes. This nearly level soil is deep and well drained. It is on low terraces along the main streams and tributaries. Most areas range from 5 to 50 acres.

Typically, the surface layer is brown silt loam about 10 inches thick. The subsoil, extending to a depth of 44 inches, is brown silt loam to a depth of 16 inches. From 16 to 44 inches it is brown to strong brown silty clay loam that has few medium faint pale brown mottles from 32 to 44 inches. The substratum to a depth of 60 inches is strong brown clay loam that has common medium faint pale brown mottles.

This soil is moderate in content of organic matter and high in natural fertility. It is slightly acid to strongly acid throughout in unlimed areas. Permeability is moderate, and the available water capacity is high. This soil has good tilth and can be worked throughout a wide range in moisture content. The root zone is deep and is easily penetrated by the roots.

Included in mapping are areas that are flooded during high floods and small areas of Nolin, Lindside, and Otwell soils.

On most of the acreage this soil is used for cultivated crops or for hay and pasture in rotation. In some areas it is used as woodland.

This soil is well suited to all of the commonly grown cultivated crops and pasture and hay plants, including corn, barley, burley tobacco, dark tobacco, soybeans,

alfalfa, and small grain. Under a high level of management, this soil can be cultivated continually.

This soil is well suited to yellow-poplar, eastern white pine, loblolly pine, black walnut, and cherrybark oak. The main concern of management is controlling competing plants until seedlings are established.

The potential of this soil for development of habitat for openland and woodland wildlife is good.

This soil is well suited to urban uses and intensive recreation uses, except in areas where some included soils are subject to flooding.

This map unit is in capability class I and woodland suitability group 2o.

ElB—Elk silt loam, 2 to 6 percent slopes. This gently sloping soil is deep and well drained. It is on stream terraces. Most areas range from 5 to 30 acres.

Typically, the surface layer is brown silt loam about 10 inches thick. The subsoil, extending to a depth of 44 inches, is brown silt loam to a depth of 16 inches. From 16 to 44 inches it is brown to strong brown silty clay loam that has few medium faint pale brown mottles from 32 to 44 inches. The substratum to a depth of 60 inches is strong brown clay loam that has common medium faint pale brown mottles.

This soil is moderate in organic matter content and high in natural fertility. It is slightly acid to strongly acid throughout in unlimed areas. Permeability is moderate, and the available water capacity is high. This soil has good tilth and can be worked throughout a wide range in moisture content. The root zone is deep and is easily penetrated by the roots.

Included in mapping are areas that are flooded during unusually high floods and small areas of Nolin, Lindside, and Otwell soils.

On most of the acreage this soil is used for cultivated crops and for hay and pasture in rotation.

This soil is well suited to a wide range of cultivated crops such as corn, tobacco, soybeans, alfalfa, and small grain. The hazard of erosion is the main limitation to cropland use, and erosion control practices are needed if cultivated crops are grown.

This soil is well suited to pasture and hay crops, including deep-rooted crops. Pasture or hay crops fit well in a rotation with grain crops. They help to control erosion and to maintain the content of organic matter and the good tilth of the soil.

This soil is well suited to yellow-poplar, eastern white pine, loblolly pine, black walnut, and cherrybark oak. Controlling plant competition when establishing stands of young seedlings is the main concern of management.

This soil has good potential for use as habitat for openland and woodland wildlife.

This soil is well suited to urban uses and intensive recreation uses, except in areas where some included soils are subject to flooding.

This map unit is in capability subclass IIe and woodland suitability group 2o.

FdB—Fredonia-Pembroke silt loams, rocky, 2 to 12 percent slopes. This complex consists of small areas of gently sloping and sloping, well drained Fredonia and Pembroke soils that are so intermingled that they could not be mapped separately at the scale used. The Fredonia soil is moderately deep, and the Pembroke soil is deep. In all areas, exposures of limestone bedrock make up about 1 percent of the surface (fig. 7). Most of the acreage of this complex is in the northeastern part of Trigg County, near the juncture with soils underlain by mixed sandstone, shale, and limestone; but some acreage occurs in all the limestone areas. Most areas are between 20 and 50 acres.

Fredonia silt loam makes up about 50 percent of each mapped area. Typically, the surface layer is brown silt loam about 1 inch thick. The subsurface layer is reddish brown silt loam about 8 inches thick. The subsoil, extending to a depth of 30 inches, is red silty clay loam to a depth of 15 inches and dark red to dusky red silty clay below that depth. It is underlain by limestone bedrock.

This Fredonia soil has a moderately deep root zone and is high in natural fertility. Permeability is moderately

Figure 7.—The exposed limestone on the Fredonia part of Fredonia-Pembroke silt loams, rocky, 2 to 12 percent slopes, hinders tillage and construction.

slow to slow, and the available water capacity is moderate. The soil is strongly acid to medium acid in the upper part unless limed and medium acid to mildly alkaline in the lower part. The content of organic matter is moderate. Tilth is good, but the scattered rock outcrop hinders the use of tillage implements. The soil has moderate shrink-swell potential. Bedrock is at a depth of 20 to 40 inches.

Pembroke silt loam makes up 40 percent of each mapped area. Typically, the surface layer is dark brown silt loam about 6 inches thick. The subsoil to a depth of 34 inches is reddish brown silty clay loam. From 34 to 46 inches it is red silty clay, and from 46 to 75 inches it is dark red clay.

This Pembroke soil is moderate in content of organic matter and high in natural fertility. It is medium acid to strongly acid throughout unless limed. Permeability is moderate, and the available water capacity is high. The root zone is deep. The soil has good tilth and can be worked throughout a wide range in moisture content. It has moderate shrink-swell potential below 34 inches.

Included in mapping are small areas of Hagerstown and Crider soils on uplands and Nolin and Lindside soils along small branches and in basins. Also included are small areas of rocky soils that have limestone at a depth of less than 20 inches.

Most areas of this complex are cleared and used mainly for pasture. Some areas are in second growth stands of hardwoods and eastern redcedar. Small wooded areas in cleared fields usually indicate limestone outcrop.

The soils in this complex are suited to most of the cultivated crops commonly grown in the survey area. The steepness of slope, a severe hazard of erosion, the moderate available water capacity of the Fredonia soil, and the rock outcrops are the main limitations to cropland use. If cultivated crops are grown, practices that control erosion and maintain the content of organic matter and the good tilth are needed.

The soils in this complex are suited to pasture. In periods of sufficient rainfall, high yields are produced. The severe hazard of erosion, the steepness of slope, and the moderate available water capacity of the Fredonia soil are the main limitations. The moderate available water capacity of the Fredonia soil limits yields in dry periods. The moderate depth to rock in the Fredonia soil limits yields of deep-rooted plants. Overgrazing results in excessive erosion and poor stands. Seeding late in summer and early in fall reduces the hazard of erosion. Rotation grazing and maintenance of optimum fertility levels help to maintain good stands of pasture plants and to control erosion.

These soils are suited to woodland use. The main concerns of management are plant competition, equipment limitation, and the hazard of erosion. The Fredonia soil is suited to Virginia pine and eastern redcedar. The Pembroke soil is suited to yellow-poplar, black walnut, white ash, eastern white pine, shortleaf pine, and loblolly pine.

These soils are suited to most urban uses and to intensive recreation uses. The moderate shrink-swell potential of the clayey subsoil material and the steepness of slope are limitations to these uses. The moderate depth to rock and the moderately slow to slow permeability are additional limitations to these uses on the Fredonia soil.

The potential of these soils for use as habitat for openland and woodland wildlife is good.

This complex is in capability subclass IIIe. The Fredonia soil is in woodland suitability group 3c, and the Pembroke soil is in woodland suitability group 1o.

FrD—Fredonia-Rock outcrop complex, 12 to 20 percent slopes. This complex consists of small areas of moderately steep, moderately deep, well drained Fredonia soil and limestone outcrop that are so intermingled that they could not be mapped separately at the scale used. Most of the acreage is in the northeast part of Trigg County, but small areas are in the limestone areas throughout the survey area. Most areas range in size from 5 to 30 acres, but some range to 102 acres.

Fredonia silt loam makes up 40 percent of each mapped area. Typically, the surface layer is dark brown silt loam about 6 inches thick. The subsoil extends to a depth of 34 inches. To a depth of about 24 inches it is dark red silty clay, and below that depth it is dusky red clay that has brown and yellow mottles. Limestone bedrock underlies the subsoil.

The Fredonia soil is medium in natural fertility and moderate in content of organic matter. Tilth is good. Permeability is moderately slow to slow, and the available water capacity is moderate. The root zone is moderately deep. Reaction ranges from strongly acid to medium acid in the upper part in unlimed areas and from medium acid to mildly alkaline in the lower part. The subsoil is moderate in shrink-swell potential. Bedrock is at a depth of 20 to 40 inches.

Limestone outcrop makes up about 35 percent of each mapped area. Limestone is at the surface, within 10 inches of the surface, or as much as 6 feet above the surface. Soil consisting of a few inches of grayish brown silt loam and a few inches of red silty clay is interspersed among the outcrops in places. This soil has very low available water capacity even where it is as much as 10 inches deep. It is suited to very few plants other than cedar. Only lichens grow on the exposed limestone.

Included in mapping are small areas of Hagerstown, Pembroke, Crider, and Hammack soils. Also included is a soil that has a clayey subsoil that is underlain by limestone at a depth of 10 to 20 inches. In places, sandstone and limestone fragments, mostly less than 6 inches long, are on and in the surface layer of the Fredonia soil and the included soils.

Most of the acreage of this complex is forested. Eastern redcedar is the dominant species in most areas. Oak, hickory, and other hardwoods are dominant in some areas.

The soil is poorly suited to cultivated crops and to hay and pasture, mainly because of the high percentage of Rock outcrop and the steepness of slope. In some areas limited grazing is possible if the soil is seeded to meadow plants, but the Rock outcrop makes seedbed preparation and weed control very difficult.

The soil is suited to woodland use. The main concerns of management are the hazard of erosion, equipment limitations, and plant competition. The soil is suited to Virginia pine and eastern redcedar.

The soil has good potential for use as habitat for woodland wildlife and fair potential for use as habitat for openland wildlife.

Because of the steepness of slope, moderate depth to rock, and Rock outcrop the soil is poorly suited to urban uses and to intensive recreation uses.

This complex is in capability subclass VIIs and woodland suitability group 3x.

FwC—Frondorf-Weikert-Wellston complex, 6 to 12 percent slopes. This complex consists of small areas of sloping Frondorf, Weikert, and Wellston soils that are so intermingled that they could not be mapped separately at the scale used. These soils are well drained. Wellston soils are deep, Frondorf soils are moderately deep, and Weikert soils are shallow. These soils are on high ridgetops and the upper part of side slopes in the northeastern part of Trigg County. Elevation ranges from 500 to 800 feet. Most areas are 5 to 65 acres.

Frondorf silt loam makes up 35 percent of this complex. Typically, the surface layer consists of a layer of very dark gray silt loam about 1 inch thick and a layer of light yellowish brown silt loam 4 inches thick. The subsoil, extending to a depth of 29 inches, is strong brown silt loam from 5 to 9 inches, strong brown silty clay loam from 9 to 21 inches, and brown channery loam from 21 to 29 inches. Yellowish brown coarse grained sandstone underlies the subsoil.

The Frondorf soil is low in natural fertility. Reaction is strongly acid or very strongly acid throughout in unlimed areas. The root zone is moderately deep. Permeability is moderate, and the available water capacity is moderate. The content of organic matter is moderate, and tilth is good. The soil can be worked throughout a wide range of moisture content without clodding. Bedrock is at a depth of 20 to 40 inches.

Weikert channery silt loam makes up 30 percent of this complex. Typically, the surface layer is brown channery silt loam about 5 inches thick. The subsoil, extending to a depth of 11 inches, is dark yellowish brown channery silt loam. The substratum, extending to a depth of 19 inches, is yellowish brown very channery loam. Fractured sandstone bedrock underlies the substratum.

The Weikert soil is low in natural fertility and content of organic matter. It is medium acid to very strongly acid throughout. The root zone is shallow. Permeability is moderately rapid, and the available water capacity is low. Tilth is poor. Bedrock is at a depth of 10 to 20 inches.

Wellston silt loam makes up 20 percent of this complex. Typically, the surface layer consists of a layer of dark grayish brown silt loam 1 inch thick and a layer of brown silt loam 4 inches thick. The subsoil, extending to a depth of 54 inches, is strong brown silt loam to a depth of 10 inches. From 10 to 46 inches it is yellowish red silty clay loam that has a few light gray mottles below a depth of 24 inches. From 46 to 54 inches it is yellowish red clay loam that is mottled in shades of gray and brown. Sandstone bedrock underlies the subsoil.

This Wellston soil is medium in natural fertility. Reaction ranges from strongly acid to very strongly acid throughout except where the surface layer has been limed. The root zone is deep. Permeability is moderate, and the available water capacity is high. The surface layer is moderate in content of organic matter and has good tilth. Sandstone or shale bedrock is at a depth of 40 to 72 inches.

Included in mapping are small areas of Fredonia and Zanesville soils and soils that are similar to the Wellston soil but have silty clay or clay horizons below a depth of 36 inches. Very small areas of exposed sandstone bedrock are in a few mapped areas.

The soils in this complex are used mostly as woodland and for hay and pasture. In a few areas they are used for cultivated crops.

These soils are poorly suited to cultivated crops. The main limitations are a severe hazard of erosion and the droughtiness of the Weikert soil. The Frondorf and Wellston soils are better suited to cropland use than the Weikert soil, but crop yields on the Frondorf soil are low. If cultivated crops are grown, management practices that control erosion are needed. Contour tillage, stripcropping, minimum tillage, the use of cover crops, and returning crop residue to the soil help control erosion and maintain the content of organic matter and the good tilth of the soil.

The soils in this complex are suited to pasture and hay. Droughtiness and, in some places, the shallowness of the root zone are limitations to high yields. These soils are best suited to grasses and legumes that can withstand short periods of drought. Rotation grazing and maintenance of optimum fertility levels help to maintain pasture plants and control erosion. Renovating pasture without plowing also helps to control erosion.

The soils in this complex are suited to woodland. The Wellston and Frondorf soils are better suited than the Weikert soil. The main concerns of management are the rate of seedling mortality on the Weikert soil and plant competition on the Frondorf and Wellston soils. The Frondorf soil is suited to yellow-poplar, shortleaf pine, black walnut, eastern white pine, and loblolly pine. The Weikert soil is suited to Virginia pine, shortleaf pine, and eastern white pine. The Wellston soil is suited to eastern white pine, black walnut, yellow-poplar, and white ash.

The soils in this complex are suited to most urban uses and to intensive recreation uses; however, the depth to rock and the slope are limitations to these uses.

These soils have good potential for use as habitat for openland and woodland wildlife.

This complex is in capability subclass IVe. Frondorf and Wellston soils are in woodland suitability group 2o. The Weikert soil is in woodland suitability group 4d.

FwD—Frondorf-Weikert-Wellston complex, 12 to 20 percent slopes. This complex consists of small areas of moderately steep Frondorf, Weikert, and Wellston soils that are so intermingled that they could not be mapped separately at the scale used. These soils are well drained. Wellston soils are deep, Frondorf soils are moderately deep, and Weikert soils are shallow. These soils are on the upper part of side slopes in the northeastern part of Trigg County. Elevation ranges from 500 to 800 feet. Most areas are 15 to 150 acres.

Frondorf silt loam makes up 35 percent of this complex. Typically, the surface layer consists of a layer of very dark gray silt loam about 1 inch thick and a layer of light yellowish brown silt loam 4 inches thick. The subsoil, extending to a depth of 29 inches, is strong brown silt loam from 5 to 9 inches and strong brown silty clay loam from 9 to 21 inches. From 21 to 29 inches it is brown channery loam. Yellowish brown coarse grained sandstone is at a depth of 29 inches.

The Frondorf soil is low in natural fertility. Reaction is strongly acid or very strongly acid throughout in unlimed areas. The root zone is moderately deep. Permeability is moderate, and the available water capacity is moderate. The content of organic matter is moderate, and tilth is good. The soil can be worked throughout a wide range in moisture content without clodding. Bedrock is at a depth of 20 to 40 inches.

Weikert channery silt loam makes up 30 percent of this complex. Typically, the surface layer is brown channery silt loam about 5 inches thick. The subsoil, extending to a depth of 11 inches, is dark yellowish brown channery silt loam. The substratum, which extends to a depth of 19 inches, is yellowish brown very channery loam. It is underlain by fractured sandstone bedrock.

The Weikert soil is low in natural fertility and content of organic matter. It is medium acid to very strongly acid throughout. The root zone is shallow. Permeability is moderately rapid, and the available water capacity is low. Tilth is poor. Bedrock is at a depth of 10 to 20 inches.

Wellston silt loam makes up 20 percent of this complex. Typically, the surface layer consists of a layer of dark grayish brown silt loam 1 inch thick and a layer of brown silt loam 4 inches thick. The subsoil to a depth of 10 inches is strong brown silt loam. From 10 to 46 inches it is yellowish red silty clay loam that has a few light gray mottles below a depth of 24 inches. From 46 to 54 inches it is yellowish red clay loam that is mottled in shades of gray and brown. Fractured sandstone is at a depth of 54 inches.

The Wellston soil is medium in natural fertility. Reaction ranges from strongly acid to very strongly acid throughout except where the surface layer has been limed. The root zone is deep. Permeability is moderate, and the available water capacity is high. The surface layer is moderate in content of organic matter and has good tilth. Sandstone or shale bedrock is at a depth of 40 to 72 inches.

Included in mapping are small areas of Fredonia and Zanesville soils and also included are soils that are similar to the Wellston soil. These similar soils have layers of silty clay or clay below a depth of 36 inches. Very small areas of exposed bedrock are in a few mapped areas.

On most of the acreage of this complex the soils are used as woodland. In a few areas they are used as pasture.

These soils are poorly suited to cultivated crops because of the steepness of slope and a very severe hazard of erosion. Droughtiness is an additional limitation to cropland use on the Weikert soil.

The soils are suited to pasture, but yields of pasture plants are generally low, especially on the Weikert soil. If the soils are used for pasture, good management practices, such as limiting grazing, must be applied.

The soils in this complex are suited to trees. Yields are commonly higher on the cool, north-facing slopes than on the south-facing slopes. The main concerns of management are the hazard of erosion, equipment limitations, seedling mortality, and plant competition. Seedling mortality is higher on the south-facing slopes, and plant competition is a more serious problem on the cool slopes. The hazard of erosion and plant competition are slight limitations on the Weikert soil. The Frondorf soil is suited to shortleaf pine, loblolly pine, and Virginia pine. On the cool slopes it is also suited to yellow-poplar, shortleaf pine, black walnut, and eastern white pine. The Weikert soil is suited to Virginia pine and shortleaf pine and, on the cool slopes, eastern white pine. On the cool slopes the Wellston soil is suited to eastern white pine, black walnut, yellow-poplar, and white ash. On the hot slopes it is suited to Virginia pine and shortleaf pine.

The soils in this complex have good potential for use as habitat for woodland wildlife.

These soils are poorly suited to urban uses and to intensive recreation uses. The steepness of slope, the shallowness of the Weikert soil, and the moderate depth of the Frondorf soil are the main limitations to these uses.

This complex is in capability subclass VIe. The Frondorf soil is in woodland suitability groups 2r (north aspect) and 3r (south aspect). The Weikert soil is in woodland suitability groups 4d (north aspect) and 5d (south aspect). The Wellston soil is in woodland suitability groups 2r (north aspect) and 3r (south aspect).

FwF—Frondorf-Weikert-Wellston complex, 20 to 50 percent slopes. This complex consists of small areas of steep and very steep Frondorf, Weikert, and Wellston soils that are so intermingled that they could not be

mapped separately at the scale used. Wellston soils are deep, Frondorf soils are moderately deep, and Weikert soils are shallow. These soils are on the upper part of side slopes in the northeastern part of Trigg County. Elevation ranges between 700 and 800 feet. Most areas are 40 to 50 acres.

Frondorf silt loam makes up 35 percent of this complex. Typically, the surface soil consists of a layer of very dark gray silt loam about 1 inch thick and a layer of light yellowish brown silt loam 4 inches thick. The subsoil, extending to a depth of 29 inches, is strong brown silt loam from 5 to 9 inches and strong brown silty clay loam from 9 to 21 inches. From 21 to 29 inches it is brown channery loam. Yellowish brown coarse grained sandstone is at a depth of 29 inches.

The Frondorf soil is low in natural fertility. In unlimed areas reaction is strongly acid or very strongly acid throughout. The root zone is moderately deep. Permeability is moderate, and the available water capacity is moderate. The content of organic matter is moderate, and tilth is good. The soil can be worked throughout a wide range in moisture content without clodding. Bedrock is at a depth of 20 to 40 inches.

Weikert channery silt loam makes up 30 percent of this complex. Typically, the surface layer is brown channery silt loam 5 inches thick. The subsoil, extending to a depth of 11 inches, is dark yellowish brown channery silt loam. The substratum, which extends to a depth of 19 inches, is yellowish brown very channery loam. It is underlain by fractured sandstone bedrock.

The Weikert soil is low in natural fertility and content of organic matter. It is medium acid to very strongly acid throughout. The root zone is shallow. Permeability is moderately rapid, and the available water capacity is low. Tilth is poor. Bedrock is at a depth of 10 to 20 inches.

Wellston silt loam makes up 20 percent of this complex. Typically, the surface layer consists of a layer of dark grayish brown silt loam 1 inch thick and a layer of brown silt loam 4 inches thick. The subsoil to a depth of 10 inches is strong brown silt loam. From 10 to 46 inches it is yellowish red silty clay loam that has a few light gray mottles below a depth of 24 inches. From 46 to 54 inches it is yellowish red clay loam that is mottled in shades of gray and brown. Fractured sandstone is at a depth of 54 inches.

This Wellston soil is medium in natural fertility. Reaction ranges from strongly acid to very strongly acid throughout except in areas where the surface layer has been limed. The root zone is deep. Permeability is moderate, and the available water capacity is high. The surface layer is moderate in organic matter content and has good tilth. Sandstone or shale bedrock is at a depth of 40 to 72 inches.

Included in mapping are small areas of Fredonia and Zanesville soils. Also included are soils that are similar to the Wellston soil. These similar soils have layers of silty clay or clay below a depth of 36 inches. About 5 to 10 percent of some areas is exposures of sandstone bedrock that form bluffs up to 25 feet high.

On most of the acreage of this complex the soils are used as woodland. In a few areas they have been cleared but are being returned to woodland use through natural revegetation or planned woodland conservation.

The soils in this complex are poorly suited to cultivated crops, hay and pasture, urban uses, and intensive recreation uses because of the steepness of slope. The hazard of erosion is very severe unless the soils are protected by permanent vegetative cover.

The soils in this complex are suited to woodland use. Yields are commonly higher on the cool slopes than on the hot slopes. The hazard of erosion, equipment limitation, seedling mortality, and plant competition are the main concerns of management. Plant competition is slight on Weikert soil, and seedling mortality is slight on the cool slopes of the Frondorf and Wellston soils. The Frondorf soil is suited to yellow-poplar, shortleaf pine, black walnut, eastern white pine, and loblolly pine on the cool slopes and to shortleaf pine, loblolly pine, and Virginia pine on the hot slopes. The Weikert soil is suited to Virginia pine, shortleaf pine, and loblolly pine on the hot slopes and to eastern white pine, shortleaf pine, and Virginia pine on the cool slopes. The Wellston soil is suited to eastern white pine, black walnut, yellow-poplar, and white ash on the cool slopes and to eastern white pine and Virginia pine on the hot slopes.

The soils in this complex have good potential for use as habitat for woodland wildlife.

This complex is in capability subclass VIIe. The Frondorf soil is in woodland suitability groups 2r (north aspect) and 3r (south aspect). The Weikert soil is in woodland suitability groups 4d (north aspect) and 5d (south aspect). The Wellston soil is in woodland suitability groups 2r (north aspect) and 3r (south aspect).

HaC—Hagerstown silt loam, 6 to 12 percent slopes. This sloping soil is deep and well drained. It is on ridgetops and side slopes in the northeastern part of Trigg County. Areas range from 10 to 65 acres.

Typically, the surface layer is brown silt loam about 8 inches thick. The subsoil, extending to a depth of 44 inches, is red silty clay loam to a depth of 13 inches. From 13 to 44 inches it is reddish brown silty clay. The substratum, which extends to limestone rock at a depth of 48 inches, is red and brown clay.

This soil is medium in natural fertility and moderate in content of organic matter. The plow layer is easy to till and can be tilled throughout a wide range in moisture content. Permeability is moderate, and the available water capacity is high. The root zone is deep. The surface layer and the upper part of the subsoil are strongly acid to very strongly acid in unlimed areas. The shrink-swell potential is moderate. Bedrock is at a depth of 40 to 60 inches or more.

Included in mapping are small areas of Nicholson, Fredonia, Zanesville, and Crider soils.

On much of the acreage this soil is used as woodland. In some areas it is used for cultivated crops and pasture and meadow plants.

This soil is suited to cultivated crops. The hazard of erosion is severe if this soil is cultivated. Irregular slope and topography prevent the use of some erosion control practices. If cultivated crops are grown, no-tillage, contour tillage, the use of cover crops, and returning crop residue to the surface help to control erosion by reducing runoff. Incorporating crop residue in the plow layer helps to maintain the content of organic matter and the good tilth.

This soil is well suited to hay and pasture. Because of the deep root zone and the high available water capacity, this soil is well suited to most grasses and legumes, including deep-rooted plants such as alfalfa. The plants respond well to high fertility levels, and high yields can be obtained under good management. Because erosion is a severe hazard if this soil is worked, establishing stands without causing excessive erosion is sometimes difficult. Stands are easier to establish late in summer and early in fall. In that period, seedbeds are easier to prepare without causing crusting, the hazard of erosion is less, and competition from undesirable plants is less. Renovation of old stands can be accomplished without plowing.

This soil is well suited to yellow-poplar, eastern white pine, white ash, and black walnut. Because of the clayey subsoil, the limitation is moderate for the use of logging equipment when the soil is wet. Plant competition is a management concern in the establishment of seedlings.

This soil has good potential for use as habitat for openland and woodland wildlife.

This soil is suited to urban uses and intensive recreation uses. The slope, shrink-swell potential of the clayey subsoil, and depth to rock are the main limitations to those uses.

This map unit is in capability subclass IIIe and woodland suitability group 1c.

HbC3—Hagerstown silty clay loam, 6 to 12 percent slopes, severely eroded. This sloping soil is deep and well drained. It is on side slopes in the northeastern part of Trigg County. The plow layer is mostly in the clayey subsoil. Shallow gullies are common. Areas range from 5 to 65 acres.

Typically, the surface layer is reddish brown silty clay loam about 5 inches thick. The subsoil, extending to 40 inches, is red silty clay loam to a depth of 9 inches. From 9 to 40 inches it is red to reddish brown silty clay. The substratum, which extends to limestone rock at a depth of 44 inches, is red and brown clay.

This soil is medium in natural fertility and low in content of organic matter. Permeability is moderate, and the available water capacity is high. Reaction is strongly acid or very strongly acid in the upper part of the subsoil and the surface layer in unlimed areas. The plow layer is difficult to work. It must be tilled within a narrow range in moisture content to prevent the formation of clods and the resulting erosion. The root zone is deep. The shrink-swell potential is moderate. Bedrock is at a depth of 40 to 60 inches or more. Sometimes a crust forms on the surface and causes poor seed germination and seedling mortality.

Included in mapping are small areas of Nicholson, Fredonia, Zanesville, Crider, Wellston, and Weikert soils.

This soil is used mainly for hay and pasture. In some areas it is used as cropland or woodland.

This soil is poorly suited to cultivated crops mainly because of the effects of past erosion and a very severe hazard of further erosion. It is suited to occasional cultivation. If cultivated crops are grown, no-tillage, contour tillage, the use of cover crops, and returning all residue to the surface help to slow runoff and control erosion, increase the content of organic matter, and improve tilth.

This soil is well suited to hay and pasture. Because of the deep root zone and the high available water capacity, this soil is well suited to most grasses and legumes, including deep-rooted plants such as alfalfa. Plants respond well to high fertility levels, and good yields can be obtained under good management. Because erosion is a very severe hazard if the soil is worked, establishing stands without causing excessive erosion is sometimes difficult. Stands are easier to establish late in summer and early in fall. In that period, seedbeds are easier to prepare without crusting, the hazard of erosion is less, and competition from undesirable plants is less. Renovation of old stands can be accomplished without plowing.

This soil is well suited to yellow-poplar, white ash, black walnut, and eastern white pine. The slickness of the surface layer when wet limits the use of equipment. Plant competition is a concern in management in establishing seedlings.

This soil has good potential for use as habitat for openland and woodland wildlife.

This soil is suited to urban uses and intensive recreation uses. The slope, shrink-swell potential of the clayey subsoil, and depth to rock are the main limitations to those uses.

This map unit is in capability subclass IVe and woodland suitability group 1c.

HcD—Hagerstown-Fredonia silt loams, very rocky, 12 to 20 percent slopes. This complex consists of small areas of moderately steep Hagerstown and Fredonia soils that are so intermingled that they could not be mapped separately at the scale used. The Hagerstown soils are deep and well drained, and the Fredonia soils are moderately deep and well drained. Outcrops of limestone bedrock are in nearly all areas and make up, on the average, about 5 percent of most of those areas. This complex is in the northeastern part of Trigg County. Most areas are 20 to 50 acres.

Hagerstown silt loam makes up 50 percent of the complex. Typically, the surface layer is brown silt loam about 8 inches thick. The subsoil, extending to a depth of 44 inches, is red silty clay loam to a depth of 13

inches. From 13 to 44 inches it is red to reddish brown silty clay. The substratum, which extends to limestone rock at a depth of 48 inches, is red and brown clay.

This Hagerstown soil is medium in natural fertility and moderate in content of organic matter. The root zone is deep. Permeability is moderate, and the available water capacity is high. In unlimed areas reaction is strongly acid or very strongly acid in the surface layer and in the upper part of the subsoil. Tilth is good. The shrink-swell potential is moderate. Bedrock is at a depth of 40 to 60 inches or more.

Fredonia silt loam makes up 35 percent of this complex. Typically, the surface layer is dark brown silt loam about 1 inch thick, and the subsurface layer is reddish brown silt loam about 5 inches thick. The subsoil, extending to a depth of 34 inches, is dark red silty clay to a depth of about 24 inches. From 24 to 34 inches it is dusky red clay that has brown and yellow mottles. Limestone bedrock is at a depth of 34 inches.

This Fredonia soil is medium in natural fertility and moderate in content of organic matter. The root zone is moderately deep. Permeability is moderately slow to slow, and the available water capacity is moderate. Tilth is good. Reaction is strongly acid to medium acid in the surface layer and the upper part of the subsoil in unlimed areas, and medium acid to mildly alkaline in the lower part. The shrink-swell potential is moderate. Bedrock is at a depth of 20 to 40 inches.

Included in mapping are small areas of Frondorf, Weikert, Wellston, Zanesville, and Pembroke soils on the uplands. Nolin, Lindside, and Newark soils are included along the small branches and in the sinkholes and basins.

Most of the acreage of this complex is forested with oak, hickory, and other hardwoods. Cedar is dominant in some areas, especially where the soils are moderately deep to limestone.

The soils in this complex are poorly suited to cultivated crops. The rock outcrop, the steepness of slope, and, on the Fredonia soil, the moderate depth to rock are limitations to cropland use. Erosion is a very severe hazard if these soils are cultivated.

These soils are suited to use as pasture. The very severe erosion hazard and rock outcrop are limitations to this use. The moderate depth to rock and moderate available water capacity are additional limitations to this use on the Fredonia soil. Seeding the pasture late in summer and early in fall reduces the hazard of erosion. The moderate depth to rock limits yields of deep-rooted plants. The moderate available water capacity limits yields in dry periods. Avoiding overgrazing helps to prevent excessive erosion and poor stands. Rotation grazing and maintenance of optimum fertility levels help to maintain good stands of pasture plants and to control erosion.

These soils are well suited to use as woodland. The main concerns of management are equipment limitations, erosion hazard, and plant competition. The Hagerstown soil is suited to black walnut, yellow-poplar, eastern white pine, and white ash. The Fredonia soil is suited to Virginia pine and eastern redcedar.

These soils have good potential for use as habitat for woodland wildlife and fair potential for use as habitat for openland wildlife.

These soils are poorly suited to urban uses and to intensive recreation areas mainly because of the steepness of slope. The moderate depth to rock of the Fredonia soil is a limitation to some urban uses.

This complex is in capability subclass VIe. The Hagerstown soil is in woodland suitability group 1c, and the Fredonia soil is in woodland suitability group 3c.

HmB—Hammack silt loam, 2 to 6 percent slopes. This is a deep, well drained, gently sloping soil. It is on ridgetops and in slightly karst areas in the northern and eastern parts of Lyon County and in the central and eastern parts of Trigg County. Most areas are between 5 and 25 acres.

Typically, the surface layer is brown silt loam about 6 inches thick. The subsoil to a depth of 25 inches is strong brown silty clay loam. From 25 to 30 inches it is mottled reddish brown and brown very cherty silt loam. From 30 to 94 inches it is dark red or dark reddish brown clay that contains a few chert fragments in some parts and is as much as 55 percent chert in other parts.

This soil is medium to high in natural fertility. Reaction ranges from medium acid to very strongly acid except where the surface layer has been limed. Permeability is moderate, the root zone is deep, and the available water capacity is high. The surface layer is moderate in content of organic matter and has good tilth. The shrink-swell potential is moderate below a depth of 30 inches.

Included in mapping are Nolin, Lindside, and Newark soils in small depressions or basins. Also included on the uplands are small areas of Nicholson, Crider, and Baxter soils, small areas of soils that have slope of more than 6 percent, and small areas of a soil that differs from the Hammack soil in having a silt mantle less than 20 inches thick over limestone residuum.

On most of the acreage this soil is used for cultivated crops and hay and pasture. On a few acres it is used as woodland.

This soil is well suited to cultivated farm crops. The hazard of erosion, which is moderate, is a slight limitation to cropland use. In karst areas the slopes are short and contour tillage is difficult. In these areas, minimum tillage, returning crop residue to the soil, and using grasses and legumes in rotation help to control erosion and maintain the content of organic matter.

This soil is well suited to pasture and hay. There are no significant limitations if good management is applied. The soil is suited to deep-rooting crops such as alfalfa.

This soil is well suited to black walnut, yellow-poplar, shortleaf pine, loblolly pine, and Virginia pine. The only significant limitation to woodland use is plant

competition, which has to be controlled until seedlings are established.

This soil has good potential for use as habitat for openland and woodland wildlife.

This soil is suited to urban development and intensive recreation uses. The shrink-swell potential and high clay content of the subsoil are the main limitations to urban use. The steepness of slope is a limitation to some urban uses.

This map unit is in capability subclass IIe and woodland suitability group 2o.

HxC—Hammack-Baxter complex, 6 to 12 percent slopes. This complex consists of small areas of sloping Hammack and Baxter soils that are so intermingled that they could not be mapped separately at the scale used. These soils are deep and well drained. They are in karst areas, which are characterized by basins (fig. 8), and on adjacent side slopes and narrow ridgetops. They are also on the upper reaches of branches draining areas without karst topography and on narrow ridgetops above moderately steep or steep side slopes. Areas of this complex are 20 to 70 acres. Areas of each soil generally range from 1 to 5 acres.

Hammack silt loam makes up approximately 55 percent of each mapped area. Typically, the surface layer is brown silt loam about 6 inches thick. The subsoil to a depth of 25 inches is strong brown silty clay loam. From 25 to 30 inches it is mottled reddish brown and brown very cherty silt loam. From 30 to 94 inches it is dark red or dark reddish brown clay that contains a few chert fragments in some parts and is as much as 55 percent chert in other parts.

The Hammack soil is medium to high in natural fertility. Reaction ranges from medium acid to very strongly acid throughout, except where the surface layer has been limed. Permeability is moderate, the root zone is deep, and the available water capacity is high. The surface

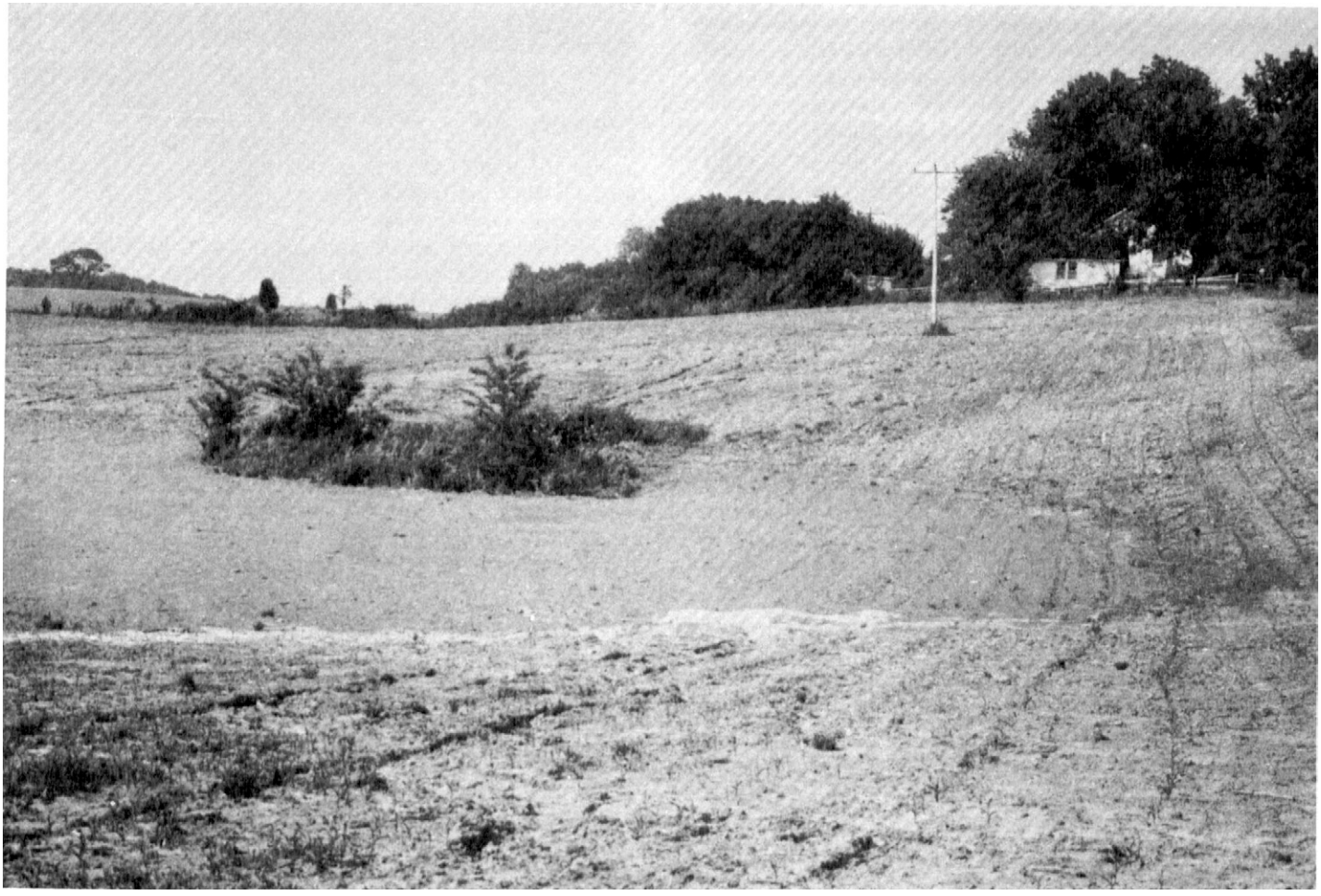


Figure 8.—The basin and the sinkhole containing small trees are characteristic of topography in areas of Hammack-Baxter complex, 6 to 12 percent slopes. Recent rains deposited the silt that outlines the small basin.

layer is moderate in content of organic matter and has good tilth. The shrink-swell potential is moderate below a depth of 30 inches.

Baxter cherty silt loam makes up about 20 percent of each mapped area. Typically, the surface layer is brown cherty silt loam about 10 inches thick. The subsoil to a depth of 18 inches is red silty clay loam that is about 5 percent chert. From 18 to 95 inches it is red or dark red cherty or very cherty silty clay or clay.

The Baxter soil is medium in natural fertility. Reaction ranges from medium to very strongly acid throughout, except where the surface layer has been limed. The root zone is deep, permeability is moderate, and the available water capacity is high. The surface layer is moderate in content of organic matter. The high content of chert in the plow layer makes tillage somewhat difficult. The shrink-swell potential is moderate below a depth of 18 inches.

Included in mapping are Nolin, Lindside, and Newark soils in small depressions or basins. Also included on the uplands are small areas of Nicholson, Crider, and Pembroke soils. In most places on the side slopes the plow layer is a mixture of original surface layer material, and in a few severely eroded places it is mostly subsoil material.

On most of the acreage the soils are used for cultivated crops and for pasture and hay. In some areas they are used as woodland or for recreation. In some areas in Fort Campbell they are used for military maneuvers.

The soils are suited to cultivated crops. They are limited for this use because of the steepness of slope and a severe hazard of erosion. Cultivating on the contour is difficult because of the irregular topography; therefore, no-tillage or minimum tillage and the use of all crop residue are needed to help control erosion. The use of grasses and legumes in the cropping system helps to control erosion and to maintain the content of organic matter and the tilth of the soil.

These soils are best suited to use as pasture and hayland. They are well suited to these uses. They are well suited to deep-rooted plants and can produce high yields. Seeding late in summer and early in fall helps to prevent excessive erosion. Good stands are established faster and more easily during that period. Maintenance of high fertility levels and rotation grazing help to increase yields, maintain good stands, and control erosion.

The soils are well suited to woodland use. The main concern of management is the control of undesirable plants during the establishment of seedlings. The Hammack soil is suited to yellow-poplar, black walnut, shortleaf pine, loblolly pine, and Virginia pine. The Baxter soil is suited to eastern white pine, loblolly pine, shortleaf pine, black locust, yellow-poplar, and Virginia pine.

These soils have good potential for use as habitat for openland and woodland wildlife.

These soils are suited to most urban uses and to intensive recreation use; however, the shrink-swell potential, high content of clay in the subsoil, and steepness of slope are the main limitations to those uses.

This complex is in capability subclass IIIe and woodland suitability group 2o.

HxC3—Hammack-Baxter complex, 6 to 12 percent slopes, severely eroded. This complex consists of small areas of sloping Hammack and Baxter soils that are so intermingled that they could not be mapped separately at the scale used. These soils are deep and well drained. They are in karst areas, which are characterized by basins, and on adjacent side slopes and narrow ridgetops. They also are on the upper reaches of branches draining areas without karst topography. They have a plow layer that is mostly subsoil. Most areas have rills or gullies. Areas of this complex generally range from 20 to 70 acres. Areas of each soil generally range from 1 to 5 acres.

Hammack silty clay loam makes up approximately 50 percent of each mapped area. Typically, the surface layer is strong brown silty clay loam about 5 inches thick. The subsoil to a depth of 21 inches is strong brown silty clay loam. From 21 to 26 inches it is mottled reddish brown and brown very cherty silt loam. From 26 to 94 inches it is dark red or dark reddish brown clay that has a few chert fragments in some parts and is as much as 55 percent chert in other parts.

This Hammack soil is medium to low in natural fertility. Reaction ranges from medium acid to very strongly acid throughout, except where the surface layer has been limed. Permeability is moderate, the root zone is deep, and the available water capacity is high. The surface layer is low in content of organic matter. The silty clay loam texture makes it somewhat difficult to work. Sometimes, a crust forms on the surface, and as a result, a low percentage of seeds germinate and a low percentage of seedlings survive. The shrink-swell potential is moderate below a depth of 26 inches.

Baxter soils make up about 35 percent of each mapped area. Typically, the surface layer is brown cherty silty clay loam about 6 inches thick. The subsoil to a depth of 14 inches is red silty clay loam that is about 5 percent chert fragments. From 14 to 95 inches it is red or dark red cherty or very cherty silty clay or clay.

The Baxter soils are medium to low in natural fertility. Reaction ranges from strongly acid to very strongly acid throughout, except where the surface layer has been limed. The root zone is deep, permeability is moderate, and the available water capacity is high. The surface layer is low in content of organic matter. The silty clay loam texture and the high content of chert make it somewhat difficult to work. A crust sometimes forms on the surface and causes poor seed germination and seedling mortality. The shrink-swell potential is moderate below a depth of 14 inches.

Included in mapping are Nolin, Lindside, and Newark soils in small depressions or basins. Also included on the uplands are small areas of Nicholson, Crider, and Pembroke soils. In many places on the side slopes the plow layer is a mixture of the original surface layer and the subsoil, and in a few slightly eroded areas it is mostly original surface layer.

On most of the acreage of this complex the soils are used for cultivated crops and for pasture and hay. In some areas they are idle land or have reverted to woodland. In some areas in Fort Campbell they are used for military maneuvers.

These soils are poorly suited to cultivated crops. They are limited to cropland use because of the effects of past erosion and a very severe hazard of further erosion if they are cultivated. They are suited to occasional cultivation. Because of the irregular topography, cultivating on the contour is difficult; therefore, no-tillage or minimum tillage and the use of all crop residue are needed to help control erosion. Including grasses and legumes in the cropping system and incorporating crop residue in the plow layer can help to increase the content of organic matter and improve the tilth of the soil.

These soils are best suited to use as pasture and hayland. They are well suited to these uses. They are well suited to deep-rooted plants. Seeding late in summer and early in fall helps to prevent excessive erosion. In that period good stands are established faster and more easily and there is less hazard of poor germination of seeds and of seedling mortality. Maintenance of high fertility levels and rotation grazing help to increase yields, maintain stands of pasture plants, and control erosion.

These soils are suited to woodland use. The main concern of management is the control of undesirable plants while establishing seedlings. The Hammack soil is suited to yellow-poplar, black walnut, shortleaf pine, loblolly pine, and Virginia pine. The Baxter soils are suited to shortleaf pine, loblolly pine, Virginia pine, and eastern redcedar.

These soils have good potential for use as habitat for openland and woodland wildlife.

The soils in this complex are suited to most urban uses and to intensive recreation uses. The shrink-swell potential, the high content of clay in the subsoil, and the steepness of slope are the main limitations to those uses.

This complex is in capability subclass IVe and woodland suitability group 3o.

HxD—Hammack-Baxter complex, 12 to 20 percent slopes. This complex consists of small areas of moderately steep Hammack and Baxter soils that are so intermingled that they could not be mapped separately at the scale used. These soils are deep and well drained. They are in karst areas, which are characterized by basins, and on adjacent side slopes and narrow ridgetops. They also are on side slopes of branches that have a dendritic drainage pattern. Areas of this complex generally range from 10 to 60 acres. Areas of each soil generally range from 1 to 3 acres.

Hammack silt loam makes up approximately 45 percent of each mapped area. Typically, the surface layer is brown silt loam about 6 inches thick. The subsoil to a depth of 25 inches is strong brown silty clay loam. From 25 to 30 inches it is mottled reddish brown and brown very cherty silt loam. From 30 to 94 inches it is dark red or dark reddish brown clay that has a few chert fragments in some parts and is as much as 55 percent chert in other parts.

The Hammack soil is medium to high in natural fertility. Reaction ranges from medium acid to very strongly acid throughout, except where the surface layer has been limed. Permeability is moderate, the root zone is deep, and the available water capacity is high. The surface layer is moderate in content of organic matter and it has good tilth. The shrink-swell potential is moderate below a depth of 30 inches.

Baxter soils make up about 30 percent of each mapped area. Typically, the surface layer is brown cherty silt loam about 10 inches thick. The subsoil to a depth of 18 inches is red silty clay loam that is about 5 percent chert fragments. From 18 to 95 inches it is red or dark red cherty or very cherty silty clay or clay.

The Baxter soils are medium in natural fertility. Reaction ranges from strongly acid to very strongly acid throughout, except where the surface layer has been limed. The root zone is deep, permeability is moderate, and the available water capacity is high. The surface layer is moderate in content of organic matter, but the high content of chert makes tillage somewhat difficult. The shrink-swell potential is moderate below a depth of 18 inches.

Included in mapping are Nolin, Lindside, and Newark soils in small depressions or basins. Also included on the uplands are small areas of Nicholson, Crider, and Pembroke soils. In many places on the side slopes the plow layer is a mixture of the original surface layer and the subsoil, and in a few severely eroded areas it is mostly subsoil.

On most of the acreage of this complex the soils are used for pasture and hay. In some areas they are used as woodland, as cultivated cropland, or as sites for recreation. In some areas in Fort Campbell they are used for military maneuvers.

These soils are poorly suited to cultivated crops because of the steepness of slope and a very severe hazard of erosion. Because of the irregular topography, cultivating on the contour is difficult; therefore, no-tillage or minimum tillage and the use of all crop residue are needed to help control erosion. Including grasses and legumes in the cropping system and incorporating crop residue in the plow layer help to maintain good tilth and the content of organic matter.

These soils are best suited to use as pasture and hayland. They are well suited to those uses. They are

well suited to deep-rooted plants. Seeding late in summer and early in fall helps to prevent excessive erosion. In that period, good stands are established faster and more easily. Maintenance of high fertility levels and rotation grazing help to increase yields, maintain stands of pasture plants, and control erosion.

These soils are well suited to woodland use. The main concerns of management are the erosion hazard, equipment limitations, and plant competition. The Hammack soil is suited to yellow-poplar, black walnut, shortleaf pine, loblolly pine, and Virginia pine. The Baxter soils are suited to eastern white pine, loblolly pine, shortleaf pine, black locust, yellow-poplar, and Virginia pine.

These soils have fair potential for use as habitat for openland wildlife and good potential for use as habitat for woodland wildlife.

These soils are poorly suited to most urban uses and intensive recreation uses. The shrink-swell potential, the high content of clay in the subsoil, and the steepness of slope are limitations to those uses.

This complex is in capability subclass IVe and woodland suitability group 2r.

HxD3—Hammack-Baxter complex, 12 to 20 percent slopes, severely eroded. This complex consists of small areas of moderately steep Hammack and Baxter soils that are so intermingled that they could not be mapped separately at the scale used. They are in karst areas, which are characterized by basins, and on adjacent side slopes and narrow ridgetops. They also are on the upper reaches of branches draining areas without karst topography. The soils of this complex are well drained and deep, and have a plow layer that is mostly subsoil. Most areas have rills or gullies. Areas range from 15 to 60 acres. Areas of each soil generally range from 1 to 3 acres.

Hammack silty clay loam makes up approximately 40 percent of each mapped area. Typically, the surface layer is strong brown silty clay loam about 5 inches thick. The subsoil to a depth of 21 inches is strong brown silty clay loam. From 21 to 26 inches it is mottled reddish brown and brown very cherty silt loam. From 26 to 94 inches it is dark red or dark reddish brown clay that has a few chert fragments in some parts and is as much as 55 percent chert in other parts.

This Hammack soil is medium to low in natural fertility. Reaction ranges from medium acid to very strongly acid throughout, except where the surface layer has been limed. Permeability is moderate, the root zone is deep, and the available water capacity is high. The surface layer is low in content of organic matter, and the silty clay loam texture makes it somewhat difficult to work. A crust sometimes forms on the surface and causes poor germination of seeds and seedling mortality. The shrink-swell potential is moderate below a depth of 26 inches.

Baxter soils make up about 40 percent of each mapped area. Typically, the surface layer is brown cherty silty clay loam about 6 inches thick. The subsoil to a depth of 14 inches is red silty clay loam that is about 5 percent chert fragments. From 14 to 95 inches it is red or dark red cherty or very cherty silty clay or clay.

The Baxter soils are medium to low in natural fertility. Reaction ranges from medium to very strongly acid throughout, except where the surface layer has been limed. The root zone is deep, permeability is moderate, and the available water capacity is high. The surface layer is low in content of organic matter, and the silty clay loam texture and high content of chert make it somewhat difficult to work. A crust sometimes forms on the surface and causes poor seed germination and seedling mortality. The shrink-swell potential is moderate below a depth of 14 inches.

Included in mapping are Nolin, Lindside, and Newark soils in small depressions or basins. Also included on the uplands are small areas of Nicholson, Crider, and Pembroke soils. In many places on the side slopes the plow layer is a mixture of the original surface layer and the subsoil, and in a few slightly eroded areas it is mostly the original surface layer.

On most of the acreage these soils are used for pasture and hay. In some areas they are idle land or have reverted to woodland. In some areas in Fort Campbell, they are used for military maneuvers.

These soils are poorly suited to cultivated crops. Their suitability is limited by the steepness of slope, the effects of past erosion, and a very severe hazard of further erosion. Because of the moderately steep slope and irregular topography, cultivating on the contour is difficult and soil and fertility losses are excessive if the soil is cultivated.

These soils are best suited to use as pasture and hayland. They are well suited to those uses. They are well suited to deep-rooted crops. Seeding late in summer and early in fall helps to prevent excessive erosion. In that period, good stands are established faster and more easily and there is less hazard of poor germination of seeds and a better chance of seedling survival. Maintenance of high fertility levels and rotation grazing help to increase yields, maintain stands of plants, and control erosion.

These soils are suited to woodland use. The main concerns of management are the erosion hazard, equipment limitations, and plant competition. The Hammack soil is suited to yellow-poplar, black walnut, shortleaf pine, Virginia pine, and loblolly pine. The Baxter soils are suited to shortleaf pine, loblolly pine, Virginia pine, and eastern redcedar.

The potential is fair for openland wildlife habitat and good for woodland wildlife habitat.

These soils are poorly suited to most urban uses and intensive recreation uses. The shrink-swell potential, the high content of clay in the subsoil, and the steepness of slope are limitations to those uses.

This complex is in capability subclass VIe and woodland suitability group 3r.

La—Lawrence silt loam. This is a deep, nearly level, somewhat poorly drained soil. It is on slightly concave uplands and stream terraces. Most areas range from 10 to 80 acres. The slope range is 0 to 2 percent.

Typically, the surface layer is brown silt loam about 8 inches thick. The subsoil to a depth of 20 inches is yellowish brown silt loam that has light brownish gray mottles. From 20 to 23 inches it is pale brown silt loam. From 23 to 43 inches it is a gray silty clay loam, very firm, brittle fragipan that has common medium prominent yellowish brown mottles. From 43 to 60 inches it is yellowish brown silt loam that has common distinct light gray mottles.

The natural fertility of this soil is medium, and the content of organic matter is low. Reaction is strongly acid or very strongly acid through the fragipan except where the surface layer has been limed. Permeability is slow, and the available water capacity is moderate. The plow layer is easy to till. The root zone is moderately deep to the fragipan, which hinders root growth and air and water movement. A seasonal water table is at a depth of 12 to 24 inches. The areas on stream terraces are subject to rare flooding, and the areas on uplands are subject to ponding. These soils may be waterlogged in winter and spring and may be droughty in summer.

Included in mapping are small areas of Nicholson and Robertsville soils. The included soils make up 10 to 20 percent of this map unit. Individual areas are generally less than 3 acres. Also included are some areas where the horizons below a depth of about 43 inches are underlain by or formed in residuum of sandstone and shale or Coastal Plain material.

On most of the acreage this soil is used for cultivated crops and for hay and pasture in rotation. In some areas it is used for hardwood forest.

This soil is suited to cultivated crops. It is better suited to crops, such as soybeans or corn, that have a short growing season in summer than it is to small grains, such as wheat, that are planted in fall. Dark tobacco grows well on this soil, but wetness limits the use of the soil for burley tobacco. The wetness, the moderately deep root zone, and the moderate available water capacity are the main limitations to cropland use. These limitations are caused by the firm, dense fragipan at a depth of about 2 feet. Wetness delays planting one to several weeks in most years. Harvesting is a problem in the rainy season. Artificial drainage can lengthen the time available for farming operations and widen the variety of plants that can be grown. Returning all crop residue helps to increase the content of organic matter and improve tilth.

This soil is well suited to pasture and hay grasses and legumes that can tolerate wetness. It is suited to tall fescue and lespedeza, which respond well to additions of limestone and fertilizer. The fragipan limits the growth of deep-rooted plants. Overgrazing and grazing when the soil is saturated should be prevented.

This soil is well suited to woodland use. It is suited to yellow-poplar, white ash, loblolly pine, and American sycamore. Wetness is a limitation to equipment use; but dry periods can be selected for most equipment needs. If seedlings are planted, control of plant competition is needed.

This soil is poorly suited to urban uses and most intensive recreation uses because of wetness and rare flooding or ponding.

This soil has good potential for use as habitat for openland and woodland wildlife and fair potential for use as habitat for wetland wildlife.

This map unit is in capability subclass IIIw and woodland suitability group 2w.

LbB—Lax silt loam, 2 to 6 percent slopes. This is a deep, moderately well drained, gently sloping soil. It is on ridgetops at elevations mostly above 570 feet. Most of the acreage is between Lake Barkley and Kentucky Lake and in the southern part of Trigg County, east of Lake Barkley. Most areas are between 20 and 70 acres.

Typically, the surface layer is brown silt loam about 7 inches thick. The subsoil to a depth of 24 inches is yellowish brown silty clay loam. From 24 to 49 inches it is a very firm and brittle fragipan. From 24 to 39 inches the pan is yellowish brown silt loam, and from 39 to 49 inches it is yellowish brown gravelly silt loam. From 49 to 72 inches the subsoil is yellowish red gravelly clay mottled in shades of gray and brown.

This soil is medium in natural fertility and is moderate in content of organic matter. It is strongly acid to very strongly acid in unlimed areas. Permeability is moderate to a depth of 24 inches and slow in the fragipan. The available water capacity is moderate. This soil has good tilth and can be worked throughout a wide range in moisture content. The root zone is moderately deep and is easily penetrated by the roots. Few roots penetrate the fragipan. A seasonal high water table is at a depth of 24 to 30 inches. The lower part of the subsoil is moderate in shrink-swell potential.

Included in mapping are small areas of Brandon and Nicholson soils on the uplands and small areas of Clifty, Nolin, and Lindside soils along the natural drainageways. Also included are small areas where the material below a depth of about 39 inches formed in reddish sandy loam or clay loam remnants of the McNary Formation of Cretaceous age. Included soils make up about 5 to 10 percent of the map unit. Individual areas are generally less than 3 acres.

On most of the acreage this soil is cleared and used for row crops and for pasture and meadow in rotation. In some areas it is used as woodland. In the Land-Between-the-Lakes area, the soil is used for recreation and as woodland and in some places is cleared and planted to food for wildlife. In Fort Campbell, it is used for military maneuvers.

This soil is well suited to cultivated crops such as corn, soybeans, tobacco, and wheat. Moderate yields can be obtained under good management. Erosion is a moderate hazard if the soil is cultivated, and erosion control practices are needed.

This soil is well suited to pasture and hay crops. These crops fit well in a rotation with grain crops. They help to control erosion and maintain good tilth. The fragipan limits the growth of deep-rooted plants. Good pasture yields can be obtained through maintenance of optimum fertility levels and rotation grazing.

This soil is well suited to woodland use. It is suited to eastern white pine, shortleaf pine, and loblolly pine. If seedlings are planted, competition from undesirable plants needs to be controlled.

This soil has good potential for use as habitat for openland and woodland wildlife. This soil is well suited to most urban uses and to intensive recreation uses. Wetness is a moderate limitation to most of those uses. It is a severe limitation to the use of this soil as a site for buildings with basements. Slow permeability and wetness are severe limitations to the use of the soil as septic tank absorption fields.

This map unit is in capability subclass IIe and woodland suitability group 3o.

LbC—Lax silt loam, 6 to 12 percent slopes. This is a deep, moderately well drained, sloping soil. It is on side slopes at elevations mostly above 570 feet. Most of the acreage is between Lake Barkley and Kentucky Lake and in the southern part of Trigg County, east of Lake Barkley. Most areas are between 10 and 90 acres.

Typically, the surface layer is brown silt loam about 7 inches thick. The subsoil to a depth of 24 inches is yellowish brown silty clay loam. From 24 to 49 inches it is a very firm and brittle fragipan. From 24 to 39 inches the pan is yellowish brown silt loam and from 39 to 49 inches it is yellowish brown gravelly silt loam. From 49 to 72 inches the subsoil is yellowish red gravelly clay mottled in shades of gray and brown.

This soil is medium in natural fertility. Reaction is strongly acid to very strongly acid through the fragipan, except where the surface layer has been limed. The root zone is moderately deep. Root growth is restricted by the fragipan. Permeability is moderate above the pan and slow in the pan. The available water capacity is moderate. The surface layer is moderate in content of organic matter and has good tilth. A seasonal high water table is within 24 to 30 inches of the surface. The lower part of the subsoil is moderate in shrink-swell potential.

Included in mapping are small areas of Brandon, Nicholson, and Saffell soils on uplands and small areas of Clifty, Nolin, and Lindside soils along natural drainageways. Also included on uplands are small areas where the material below a depth of about 39 inches formed in reddish sandy loam or clay loam remnants of the McNary Formation of Cretaceous age. Included soils make up about 5 to 10 percent of the map unit. Individual areas are generally less than three acres.

Most of the acreage of this soil is in the Land-Between-the-Lakes area. In this area the soil is used for extensive recreation and wildlife habitat and as woodland. In some places in the Land-Between-the-Lakes area and in other parts of the survey area the soil is cleared and used for cultivated crops and pasture. In the Fort Campbell area the soil is used for food crops for wildlife and for military maneuvers.

This soil is suited to cultivated crops such as corn, soybeans, tobacco, and wheat. Moderate yields can be obtained under good management. The hazard of erosion is severe if the soil is cultivated. Management practices that control erosion and maintain the content of organic matter and the good tilth are needed. The fragipan restricts root growth and the movement of air and water.

This soil is well suited to pasture and hay crops. These crops fit well in a rotation with grain crops. Practices that help to control erosion and maintain good tilth are needed. The fragipan limits the growth of deep-rooted plants. Good pasture yields can be obtained through the maintenance of optimum fertility levels and rotation grazing.

This soil is suited to woodland use. It is suited to eastern white pine, shortleaf pine, and loblolly pine. If seedlings are planted, competition from undesirable plants needs to be controlled.

This soil has good potential for use as habitat for openland and woodland wildlife.

This soil is suited to most urban uses and intensive recreation uses, but slow permeability, steepness of slope, and wetness are the main limitations to these uses.

The map unit is in capability subclass IIIe and woodland suitability group 3o.

LcC3—Lax silty clay loam, 6 to 12 percent slopes, severely eroded. This is a deep, severely eroded, moderately well drained, sloping soil. It is on side slopes at elevations mostly above 570 feet. The plow layer is mostly subsoil material. In most areas rills and gullies have formed. Most of the acreage is between Lake Barkley and Kentucky Lake and in the southern part of Trigg County, east of Lake Barkley. Most areas are between 5 and 40 acres.

Typically, the surface layer is brown silty clay loam about 3 inches thick. The subsoil to a depth of 21 inches is yellowish brown silty clay loam from 3 to about 21 inches. From 21 to 45 inches it is a very firm and brittle fragipan. From 21 to 35 inches the pan is yellowish brown silt loam and from 35 to 45 inches it is yellowish brown gravelly silt loam. From 45 to 72 inches the subsoil is yellowish red gravelly clay mottled in shades of gray and brown.

This soil is low in natural fertility and low in content of organic matter. Reaction is strongly acid or very strongly acid throughout, except where the surface layer has been limed. The fragipan restricts the movement of air and water. Because of the fragipan the root zone is moderately deep and the seasonal high water table is at a depth of 18 to 30 inches. Permeability is moderate above the fragipan and slow in the pan. The available

water capacity is moderate. The soil is easy to cultivate but needs to be worked within a narrow range in moisture content to prevent clodding. The lower part of the subsoil is moderate in shrink-swell potential.

Included in mapping are small areas of Brandon, Nicholson, and Saffell soils on uplands and small areas of Clifty, Nolin, and Lindside soils along natural drainageways. Also included on uplands are small areas where the material below a depth of about 35 inches formed in reddish sandy loam or clay loam remnants of the McNary Formation of Cretaceous age. The included soils make up about 5 to 10 percent of the map unit. Individual areas are generally less than 3 acres.

In most areas, this soil was severely eroded after it was cleared. In some areas it is idle land, and in many areas it has been seeded to pasture. In many areas it has been naturally reforested by sassafras, persimmon, elm, dogwood, and sumac. Some loblolly and shortleaf pine have been planted in a few small areas.

This soil is poorly suited to cultivated crops such as corn, soybeans, tobacco, and wheat. Erosion is a very severe hazard if the soil is cultivated, but the soil is suited to occasional cultivation. Erosion control practices are needed. The fragipan restricts root growth and the movement of air and water. Moderate yields can be obtained under good management.

This soil is well suited to pasture and hay crops. These crops fit well in a rotation with grain crops. They help to control erosion and improve the organic matter supply and the tilth. The fragipan limits the growth of deep-rooted plants. Good pasture yields can be obtained through maintenance of optimum fertility levels and rotation grazing.

This soil is suited to woodland use. It is suited to eastern white pine, loblolly pine, and shortleaf pine. If seedlings are planted, competition from undesirable plants needs to be controlled.

This soil has good potential for use as habitat for openland and woodland wildlife.

This soil is suited to most urban uses and intensive recreation uses, but the wetness, slow permeability, and steepness of slope are limitations to those uses.

This map unit is in capability subclass IVe and woodland suitability group 3o.

LeC—Lexington silt loam, 6 to 12 percent slopes. This is a deep, well drained, sloping soil. It is on ridgetops near Kentucky Lake and Lake Barkley at elevations mostly below 480 feet. Most of the acreage is near Kentucky Lake in Lyon County. Most areas are 5 to 55 acres.

Typically, the surface layer consists of a layer of very dark gray silt loam about 1 inch thick and a layer of brown silt loam 9 inches thick. The subsoil to a depth of 31 inches is yellowish red silty clay loam. From 31 to 42 inches it is yellowish red sandy clay loam, and from 42 to 74 inches it is reddish brown sandy loam and light yellowish brown loamy sand.

This soil is medium in natural fertility and low in content of organic matter. It is medium to very strongly acid in unlimed areas. Permeability is moderate in the layers of loess and moderately rapid in the layers of sandy loam and loamy sand. The available water capacity is high. The soil has good tilth and can be worked throughout a wide range in moisture content. The root zone is deep and is easily penetrated by the roots.

Included in mapping are small areas of Brandon, Hammack, and Lax soils. In narrow areas in the middle of most ridgetops the slope is less than 6 percent. The loess is more than 4 feet thick in some small areas. In some spots the surface layer is sandy loam and the subsoil is silty clay loam. In other spots the surface layer is sandy loam and the subsoil is sandy clay loam. In places gravelly Coastal Plain deposits or residuum of cherty limestone are at a depth of 3 to 4 feet. Small areas of Nolin, Lindside, and Newark soils are along the drainageways.

Most of the acreage of this soil is in the Land-Between-the-Lakes area. In this area the soil is used as woodland and for recreation. Camping areas and beaches are intensive recreation uses. The soil supports food and cover for wildlife, and the wildlife provide extensive recreation activities such as hunting and bird watching.

This soil is suited to cultivated crops. It is suited to such commonly grown crops as corn, wheat, soybeans, and tobacco. The hazard of erosion is severe, and practices that control erosion are needed in cultivated areas. Growing grasses and legumes in the cropping system and incorporating crop residue into the plow layer help to control erosion, maintain the supply of organic matter, and maintain good tilth.

This soil is well suited to pasture and meadow plants. It is suited to deep-rooted plants.

This soil is suited to woodland. It is suited to cherrybark oak, Shumard oak, yellow-poplar, sweet gum, and loblolly pine. The main management concern is control of competing plants while establishing seedlings.

This soil has good potential for use as habitat for openland and woodland wildlife.

This soil is suited to most urban and intensive recreation uses. The steepness of slope is the main limitation except on the less sloping narrow ridgetops. Moderately rapid permeability in the lower part of the subsoil is a limitation to some uses. In a few places the strata of loamy sand are thick enough to be mined for beach sand, creating sand pits.

This map unit is in capability subclass IIIe and woodland suitability group 3o.

LeC3—Lexington silt loam, 6 to 12 percent slopes, severely eroded. This is a deep, severely eroded, well drained, sloping soil. It is on side slopes at elevations below 480 feet near Kentucky Lake and Lake Barkley. Most of the acreage is in Lyon County near Kentucky

Lake. The plow layer is mostly subsoil material. In most areas rills and gullies have formed. Most areas are 5 to 55 acres.

Typically, the surface layer is brown silt loam about 5 inches thick. The subsoil to a depth of 26 inches is yellowish red silty clay loam. From 26 to 37 inches it is yellowish red sandy clay loam, and from 37 to 74 inches it is reddish brown sandy loam and light yellowish brown loamy sand.

This soil is low in natural fertility and in content of organic matter. It is strongly acid to medium acid in unlimed areas. Permeability is moderate in the loess layers and is moderately rapid in the sandy loam and loamy sand layers. The available water capacity is high. The soil has fair tilth and can be worked throughout a wide range in moisture content. The root zone is deep and is easily penetrated by the roots.

Included in mapping are small areas of Brandon, Hammack, and Lax soils. There are small areas where loess is more than 4 feet thick. In some spots the surface layer is sandy loam and the subsoil is silty clay loam. In other spots the surface layer is sandy loam and the subsoil is sandy clay loam. In places gravelly Coastal Plain deposits or residuum of cherty limestone are at a depth of 3 to 4 feet. Along the drainageways are small areas of Nolin, Lindside, and Newark soils.

Most of the acreage of this soil is in the Land-Between-the-Lakes area. In this area the soil is used as woodland and for intensive recreation uses such as camping areas and beaches. The soil also supports food and cover for wildlife.

This soil is poorly suited to cultivated crops, mainly because of the effects of past erosion. It is suited to occasional cultivation. The hazard of erosion is very severe, and conservation measures that control erosion are needed if the soil is cultivated. Grasses and legumes in the cropping system help to control erosion, improve tilth, and increase the content of organic matter.

This soil is suited to woodland use. It is suited to cherrybark oak, Shumard oak, yellow-poplar, sweetgum, and loblolly pine. The main concern of management is the control of competing plants in establishing seedlings.

This soil has good potential for use as habitat for openland and woodland wildlife.

This soil is suited to most urban uses and intensive recreation uses. Slope is a moderate limitation to these uses. The hazard of seepage is a limitation to such urban uses as sewage lagoons and sanitary landfills because permeability is moderately rapid in the lower part of the subsoil. In a few places the strata of loamy sand are thick enough to be mined for beach sand, creating sand pits.

This map unit is in capability subclass IVe and woodland suitability group 3o.

LfD—Lexington complex, 12 to 20 percent slopes. The soils in this complex consists of small areas of a moderately steep Lexington soil and a similar soil that are so intermingled that they could not be mapped separately at the scale used. These deep, well drained soils are on side slopes near Kentucky Lake or Lake Barkley. Most of the acreage is in Lyon County near Kentucky Lake. Areas generally range from 5 to 55 acres.

Lexington silt loam makes up approximately 60 percent of each mapped area. Typically, the surface layer consists of a layer of very dark gray silt loam about 1 inch thick and a layer of brown silt loam 9 inches thick. The subsoil to a depth of 31 inches is yellowish red silty clay loam. From 31 to 74 inches it is reddish brown sandy loam that has lenses of light brown loamy sand.

The Lexington soil is medium in natural fertility and low in content of organic matter. It is medium to very strongly acid in unlimed areas. Permeability is moderate in the loess layers and moderately rapid in the sandy loam and loamy sand layers. The available water capacity is high. The root zone is deep and is easily penetrated by the roots. Tilth is good, and the plow layer can be worked throughout a wide range in moisture content.

The similar soil makes up about 30 percent of each mapped area. It is generally on the lower part of side slopes. It is like the Lexington soil except that it has a brown fine sandy loam surface layer that is 6 to 12 inches thick and a yellowish red sandy loam subsoil. Below a depth of about 30 inches, this soil and the Lexington soil have the same range of characteristics.

The similar soil has moderately rapid permeability. The available water capacity is moderate to high. Other soil properties are the same as those given for the Lexington soil.

Included in mapping are small areas of Brandon, Hammack, and Baxter soils, severely eroded areas on uplands, and areas of Nolin, Clifty, Lindside, and Newark soils on the small branch bottoms.

Most of the acreage of this complex is in the Land-Between-the-Lakes area. On this acreage the soil is used for woodland and extensive recreation.

The soils of this unit are poorly suited to cultivated crops. Because of the moderately steep slopes, there is a hazard of erosion and excessive soil loss if the soil is cultivated.

The suitability of these soils for pasture and meadow crops is fair. The soils are suited to most of the locally grown pasture grasses and legumes. Moderate yields can be obtained under good management.

The soils of this complex are suited to woodland. They are suited to cherrybark oak, Shumard oak, yellow-poplar, sweetgum, and loblolly pine. Trails and logging roads should be laid out on the contour to help control erosion. If seedlings are planted, competition from undesirable plants needs to be controlled.

The soils of this complex have good potential for use as habitat for woodland wildlife and fair potential for use as habitat for openland wildlife.

The soils of this complex are poorly suited to most urban and intensive recreation uses. The steepness of

slope is a severe limitation to those uses. The hazard of seepage is a limitation to such urban uses as sewage lagoons and sanitary landfills because permeability is moderately rapid in the lower part of the subsoil. In a few places the strata of loamy sand are thick enough to be mined. Mining creates sand pits.

This complex is in capability subclass VIe and woodland suitability group 3o.

Ln—Lindside silt loam. This is a deep, moderately well drained, nearly level soil. It is on flood plains and in upland depressions. Areas are 5 to 50 acres. Slope ranges from 0 to 3 percent.

Typically, the surface layer is brown silt loam 7 inches thick. The subsoil to a depth of 18 inches is brown silt loam. From 18 to 47 inches it is brown silt loam with common medium distinct mottles of light brownish gray and pale brown. From 47 to 60 inches it is reddish brown silty clay loam mottled with gray. On the flood plains of the larger streams, the brown silt loam that is mottled extends to a depth of 60 inches or more.

This soil is high in natural fertility and moderate in content of organic matter. Permeability is moderate, and the available water capacity is high. This soil is subject to occasional brief periods of flooding. Some areas in basins and depressions are flooded for a period of a few hours to several weeks after heavy rainfall. Many areas adjoin Lake Barkley and are flooded by heavy rains when Lake Barkley is at a summer pool stage. The seasonal water table is at a depth of 18 to 36 inches in the wetter periods of winter and early spring. Reaction ranges from medium acid to mildly alkaline. The soil has a deep root zone and has good tilth.

Included in mapping are small areas of Nolin, Newark, and Clifty soils. Also included are small areas where the subsoil is strongly acid.

On most of the acreage this soil is used for intensively cultivated crops. In some areas it is used for hay and pasture in rotation or for woodland. In some areas it is idle land.

This soil is well suited to cultivated crops. It produces high yields under good management. The main limitation is slight wetness. Flooding seldom occurs during the growing season. In some years planting is delayed a few days because of wetness. Drainage is not required. It can, however, lengthen the time for field operations and improve the suitability of the soil for some crops. Diversion ditches are effective in controlling overwash from adjacent areas. Returning crop residue to the soil maintains the content of organic matter and the good tilth.

This soil is well suited to pasture and hay. Flooding is a hazard, but because the duration of flooding is usually brief, the crops are seldom destroyed. Tilling improves the aeration of the lower part of the subsoil and permits deeper root growth. This soil is well suited to mid-summer supplemental pasture and hay crops. The high content of available moisture permits good growth in relatively dry periods.

This soil is well suited to woodland. It is suited to yellow-poplar, white ash, black walnut, and eastern white pine. Wetness is a slight limitation to use of equipment in some seasons. Planting and harvesting operations can be carried out during dry periods. If trees are planted, control of plant competition is required.

This soil has good potential for use as habitat for openland and woodland wildlife.

This soil is poorly suited to urban uses and intensive recreation uses, mainly because of the flood hazard. Wetness is a limitation to some uses.

This map unit is in capability subclass IIw and woodland suitability group 1o.

Me—Melvin silt loam. This nearly level, deep, poorly drained soil is on flood plains along streams and in depressions throughout the survey area. Areas range from 3 to 10 acres. Slope ranges from 0 to 2 percent.

Typically, the surface layer is grayish brown silt loam 8 inches thick. The subsoil, extending to a depth of 24 inches, is gray silt loam mottled with strong brown and yellowish brown. The substratum from 24 to 60 inches is gray silty clay loam.

This soil is medium in natural fertility. The organic matter content is moderate. Reaction ranges from medium acid to mildly alkaline. The root zone is deep. The plow layer has good tilth. Permeability is moderate, and the available water capacity is high. The seasonal water table is at the surface or within 12 inches of the surface for long periods. The soil is subject to flooding for brief periods.

Included in mapping are small areas of Newark and Lindside soils. Also included are areas where the surface layer is silty clay loam and small areas where the subsoil is strongly acid.

On much of the acreage this soil is used as woodland. In some areas it has been cleared and is used for hay and pasture or for cultivated crops.

This soil is suited to cultivated crops. It is not subject to erosion and can be cultivated year after year if properly drained. Because the soil is subject to flooding and is usually waterlogged during winter, the crops should be planted late in spring. The soil is best suited to crops that can tolerate wetness and that have a short growing season. It is suited to soybeans and corn if it is drained. Tile drainage and open ditches are needed to reduce wetness.

This soil is suited to pasture and hay crops. It is best suited to pasture grasses and legumes that can tolerate flooding and wetness, which are the main limitations. In wet periods, grazing should be restricted. Overgrazing and grazing when the water table is near the surface can damage the plant cover and compact the soil.

This soil is well suited to woodland use. It is suited to pin oak, American sycamore, sweetgum, and loblolly pine. Wetness is a severe limitation to the use of equipment, but most management operations can be carried out in dry periods. The hazard of seedling

mortality is severe. If seedlings are planted, plant competition should be controlled and, if possible, wetness should be reduced.

This soil has good potential for use as habitat for wetland wildlife.

This soil is poorly suited to urban uses and to intensive recreation uses. Flooding and wetness are the main limitations.

This map unit is in capability subclass IIIw and woodland suitability group 1w.

Ne—Newark silt loam. This is a deep, somewhat poorly drained, nearly level soil. It is on flood plains and in upland depressions. Areas are 10 to 90 acres. Slope ranges from 0 to 2 percent.

Typically, the surface layer is dark grayish brown silt loam 7 inches thick. The subsoil to a depth of 16 inches is dark grayish brown silt loam mottled with light grayish brown. From 16 inches to 22 inches it is light brownish gray silt loam mottled with yellowish brown and brown. From 22 to 35 inches it is gray silty clay loam mottled with strong brown, brown, and yellowish brown. The substratum to a depth of 60 inches is gray silty clay loam mottled with brown and yellowish brown.

This Newark soil has moderate permeability. The natural fertility is medium, and the content of organic matter is moderate. Reaction is medium acid to mildly alkaline. The available water capacity is high. The soil is subject to occasional brief periods of flooding from December to May, and in some areas in depressions it is subject to flooding in summer. The high water table is at a depth of 6 to 18 inches. The soil is easy to till, and it has a deep root zone.

Included in mapping are small areas of Nolin, Lindside, and Melvin soils. A few gravelly soils are included. Also included are soils that are strongly acid or very strongly acid. The included soils make up less than 10 percent of this map unit. Areas are generally less than 3 acres.

On most of the acreage this soil is used for cultivated crops and for hay and pasture in rotation. In some areas it is used as woodland.

This soil is well suited to cultivated crops if it is drained. Wetness, the main limitation, often delays planting and tillage and sometimes delays the harvesting of crops. Flooding seldom occurs during the growing season. Artificial drainage can lengthen the effective growing season and widen the range of suitable plants. Tile drainage is very effective on this soil if suitable outlets are available. Returning crop residue to the soil maintains the good tilth and the organic matter content.

This soil is well suited to pasture and hay crops. It is best suited to grasses and legumes that tolerate moderate wetness and withstand flooding for short periods. If the soil is drained, most commonly grown plants do well. Grazing should be avoided if the soil is saturated.

This soil is well suited to woodland use. It is suited to cherrybark oak, eastern cottonwood, sweetgum, loblolly pine, American sycamore, and eastern white pine. Wetness is a moderate limitation to the use of equipment, but most management operations can be carried out during dry periods. Control of plant competition is needed if seedlings are planted.

This soil has good potential for use as habitat for woodland wildlife and fair potential for use as habitat for openland and wetland wildlife.

This soil is poorly suited to urban and intensive recreation uses, mainly because of flooding and wetness.

This map unit is in capability subclass IIw and woodland suitability group 1w.

NhA—Nicholson silt loam, 0 to 2 percent slopes. This is a deep, moderately well drained, nearly level soil. It is on broad ridgetops and in low areas around the head of drainageways. Areas are 3 to 10 acres.

Typically, the surface layer is dark grayish brown silt loam about 3 inches thick. The subsurface layer is yellowish brown silt loam about 5 inches thick. The subsoil to a depth of 21 inches is strong brown silty clay loam. From 21 to 27 inches it is yellowish brown silt loam that has light brownish gray and pale brown mottles. From 27 to 55 inches it is a fragipan. In the upper 18 inches the fragipan is brown silt loam that has light brownish gray and strong brown mottles. In the lower 10 inches it is brown cherty silt loam that has pale brown and yellowish brown mottles. Beneath the fragipan, to a depth of 70 inches or more, the subsoil is red silty clay that has pinkish gray, light gray, and reddish yellow mottles and is 5 percent chert fragments.

This soil is medium in natural fertility. Reaction is medium acid to very strongly acid through the fragipan except where the surface layer has been limed. The root zone is moderately deep. Root growth is restricted by the fragipan. Permeability is moderate above the fragipan and slow in the fragipan. The available water capacity is moderate. The surface layer is moderate in content of organic matter and has good tilth. A seasonal high water table is at a depth of 18 to 30 inches. The lower part of the subsoil is moderate in shrink-swell potential.

Included in mapping are small areas of Lawrence, Lax, and Hammack soils. The included soils make up 0 to 10 percent of the map unit. Individual areas are less than 3 acres.

On most of the acreage this soil is used for cultivated crops and for hay and pasture in rotation. In a few areas it is used as woodland.

This soil is well suited to cultivated crops, including dark tobacco. It is fairly well suited to burley tobacco. Wetness is a moderate limitation that in most years delays the planting and sometimes the harvesting of crops. This nearly level soil can be cultivated continually if the content of organic matter and the fertility are maintained. Returning crop residue to the soil, using cover crops, and including grasses and legumes in the cropping system help to maintain the content of organic matter and the good tilth.

This soil is well suited to pasture and hay crops. The moderate rooting depth limits the variety of plants to grow. For example, this soil is not well suited to some deep-rooted plants, such as alfalfa. The maintenance of optimum fertility levels and rotation grazing help to increase and maintain good stands.

This soil is well suited to woodland use. It is suited to black walnut, yellow-poplar, eastern white pine, shortleaf pine, and white ash. If seedlings are planted, control of competition from undesirable plants is needed until the seedlings are established.

This soil has good potential for use as habitat for openland and woodland wildlife.

This soil is fairly well suited to most urban uses and to intensive recreation uses. Wetness is a moderate limitation to those uses. It is a severe limitation to the use of this soil as a site for buildings with basements and to some other uses. The slow permeability and wetness are severe limitations to the use of this soil as septic tank absorption fields.

This map unit is in capability subclass IIw and woodland suitability group 2o.

NhB—Nicholson silt loam, 2 to 6 percent slopes. This is a deep, moderately well drained, gently sloping soil. It is on broad ridges on uplands. Areas are from 10 to 50 acres.

Typically, the surface layer is dark grayish brown silt loam about 3 inches thick. The subsurface layer is yellowish brown silt loam about 5 inches thick. The subsoil to a depth of 21 inches is strong brown silty clay loam. From 21 to 27 inches it is yellowish brown silt loam that has light brownish gray and pale brown mottles. From 27 to 55 inches it is a fragipan. In the upper 18 inches the fragipan is brown silt loam that has light brownish gray mottles. In the lower 10 inches it is brown cherty silt loam that has pale brown and yellowish brown mottles. Beneath the fragipan, to a depth of 70 inches or more, the subsoil is red silty clay that has pinkish gray, light gray, and reddish yellow mottles and is 5 percent chert fragments.

This soil is medium in natural fertility. Reaction is medium acid to very strongly acid through the fragipan, except where the surface layer has been limed. The root zone is moderately deep. It is restricted by the fragipan. Permeability is moderate above the fragipan and slow in the fragipan. The available water capacity is moderate. The surface layer is moderate in content of organic matter and has good tilth. A seasonal high water table is at a depth of 18 to 30 inches. The lower part of the subsoil is moderate in shrink-swell potential.

Included in mapping are small areas of Lawrence, Lax, and Hammack soils on the uplands. In the drainageways are small areas of Nolin, Linside, Newark, and Melvin soils. The included soils make up 5 to 15 percent of the map unit. Individual areas are less than 3 acres.

On most of the acreage this soil is used for cultivated crops and for hay and pasture in rotation. In a few areas it is used as woodland.

This soil is well suited to cultivated crops, including dark tobacco. It is fairly well suited to burley tobacco. The hazard of erosion is a moderate limitation. No-tillage, contour tillage, stripcropping, the use of cover crops, and the use of grasses and legumes in the cropping system help to reduce runoff and control erosion. Returning crop residue to the soil also helps to control erosion and to maintain the content of organic matter and the good tilth. The fragipan restricts the growth of roots and the movement of air and water. In spring, a perched water table caused by the fragipan can delay planting.

This soil is well suited to pasture and hay. These crops fit well in a rotation with grain crops. They help to control erosion and to maintain good tilth. The fragipan limits the use of this soil for deep-rooted plants. Maintenance of optimum fertility levels and rotating grazing and other good management practices help to obtain good pasture yields.

This soil is well suited to woodland use. It is suited to black walnut, yellow-poplar, eastern white pine, shortleaf pine, and white ash. If seedlings are planted, control of competition from undesirable plants is needed until the seedlings are established.

This soil has good potential for use as habitat for openland and woodland wildlife.

This soil is fairly well suited to most urban uses and to intensive recreation uses. Wetness is a moderate limitation to those uses. It is a severe limitation to the use of this soil as a site for buildings with basements and to some other uses. The slow permeability of the fragipan and wetness are severe limitations to the use of this soil as septic tank absorption fields.

This map unit is in capability subclass IIe and woodland suitability group 2o.

NhC—Nicholson silt loam, 6 to 12 percent slopes. This is a deep, moderately well drained, sloping soil. It is on side slopes on uplands. Areas are 5 to 70 acres.

Typically, the surface layer is dark grayish brown silt loam about 3 inches thick. The subsurface layer is yellowish brown silt loam about 5 inches thick. The subsoil to a depth of 21 inches is strong brown silty clay loam. From 21 to 27 inches it is yellowish brown silt loam that has light brownish gray and pale brown mottles. From 27 to 55 inches it is a compact and brittle fragipan. In the upper 18 inches the fragipan is brown silt loam that has light brownish gray mottles. In the lower 10 inches it is brown cherty silt loam that has pale brown mottles. Beneath the fragipan, to a depth of 70 inches or more, the subsoil is red silty clay that has pinkish gray, light gray, and reddish yellow mottles and is 5 percent chert fragments.

This soil is medium in natural fertility. Reaction is medium acid to very strongly acid through the fragipan, except where the surface layer has been limed. The root zone is moderately deep. Root growth is restricted by the fragipan. Permeability is moderate above the fragipan

and slow in the fragipan. The available water capacity is moderate. The surface layer is moderate in content of organic matter and has good tilth. A seasonal high water table is at a depth of 18 to 30 inches. The lower part of the subsoil is moderate in shrink-swell potential.

Included in mapping are small areas of Hammack and Lax soils on the uplands. Along the drainageways are small areas of Nolin, Lindside, and Newark soils. The included soils make up 10 to 20 percent of the map unit. Individual areas are less than 3 acres.

This soil is used mainly for hay and pasture in rotation and for occasional cultivation of row crops. In a few areas it is used as woodland.

This soil is suited to cultivated crops. Erosion is a severe hazard if this soil is cultivated. No-tillage, contour tillage, stripcropping, the use of cover crops, and including grasses and legumes in the cropping system help to reduce runoff, control erosion, and maintain the content of organic matter and the good tilth. The fragipan restricts the growth of roots and movement of air and water. In spring, a perched water table caused by the fragipan can delay planting.

Because of the erosion hazard, this soil is better suited to pasture and hay crops, and it is well suited to these crops. Seedling late in summer or early in fall generally results in better stands, quick cover, less competition from undesirable plants, and better erosion control. The fragipan limits the use of this soil for deep-rooted plants. Maintenance of optimum fertility levels and rotation grazing help to increase yields and prolong the life of pasture plants.

This soil is well suited to woodland use. It is suited to yellow-poplar, black walnut, eastern white pine, shortleaf pine, and white ash. If seedlings are planted, control of undesirable plants is needed until the seedlings are established.

The potential is good for habitat for openland wildlife.

This soil is suited to most urban and intensive recreation uses, but the steepness of slope, wetness, and slow permeability of the fragipan are limitations to those uses.

This map unit is in capability subclass IIIe and woodland suitability group 2o.

NIC3—Nicholson silty clay loam, 6 to 12 percent slopes, severely eroded. This is a deep, moderately well drained, sloping soil. It is on side slopes of uplands. The plow layer is mostly subsoil. Most areas have rills or shallow gullies. Most areas are 5 to 50 acres.

Typically, the surface layer is yellowish brown silty clay loam 5 inches thick. The subsoil to a depth of 16 inches is strong brown silty clay loam. From 16 to 21 inches it is yellowish brown silt loam that has light brownish gray and pale brown mottles. From 21 to 50 inches it is a fragipan. In the upper 19 inches the fragipan is brown silt loam that has light brownish gray mottles. In the lower 40 to 50 inches it is brown cherty silt loam that has pale brown and yellowish brown mottles. Beneath the fragipan, to a depth of 70 inches or more, the subsoil is red silty clay that has pinkish gray, light gray, and reddish yellow mottles and is 5 percent chert fragments.

This soil is low in natural fertility. Reaction is medium acid to very strongly acid through the fragipan except where the surface layer has been limed. The root zone is moderately deep. Root growth is restricted by the fragipan. Permeability is moderate above the fragipan and slow in the fragipan. The available water capacity is moderate. The surface layer is low in content of organic matter and has fair tilth. A seasonal high water table is at a depth of 8 to 30 inches. The lower part of the subsoil is moderate in shrink-swell potential.

Included in mapping are small areas of Hammack and Lax soils on the uplands. Along the drainageways are small areas of Nolin, Lindside, and Newark soils. The included soils make up 10 to 20 percent of the map unit. Individual areas are less than 3 acres.

This soil is mainly idle land or it is used for pasture and occasionally for cultivated crops. In some areas it has reverted to woodland.

This soil is poorly suited to cultivated crops mainly because of the effects of past erosion. Erosion is a very severe hazard if this soil is cultivated. If adequate measures are taken to control erosion, this soil can be cultivated occasionally. No-tillage, contour tillage, stripcropping, the use of cover crops, and including grasses and legumes in the cropping system help to reduce runoff, control erosion, and maintain the content of organic matter and the good tilth. The fragipan restricts the growth of roots and the movement of air and water. In spring a perched water table caused by the fragipan can delay planting.

Because of the very severe hazard of erosion if it is cultivated, this soil is better suited to pasture. It is suited to most of the locally grown grasses and legumes. Seeding late in summer or early in fall generally results in better stands, quick cover, less competition from undesirable plants, and better erosion control. The fragipan limits the use of this soil for deep-rooted plants. Maintenance of optimum fertility levels and rotation grazing help to increase yields and prolong the life of pasture plants.

This soil is suited to woodland use. It is suited to loblolly pine, eastern white pine, shortleaf pine, and black locust. If seedlings are planted, control of undesirable plants is needed until the seedlings are established.

The potential is good for habitat for openland and woodland wildlife.

This soil is suited to most urban and intensive recreation uses, but the steepness of slope, wetness, and slow permeability of the fragipan are limitations to those uses.

This map unit is in capability subclass IVe and woodland suitability group 3o.

No—Nolin silt loam. This is a deep, well drained, nearly level soil. It is on flood plains and in depressions on

uplands. Most of the acreage is near the larger streams. Most areas range from 3 to 60 acres. The slope range is 0 to 2 percent.

Typically, the surface layer is brown silt loam about 10 inches thick. The subsoil extends to a depth of 48 inches. To a depth of 33 inches it is dark yellowish brown silt loam that has brown mottles. From 33 to 48 inches it is yellowish brown silt loam that has brown and pale brown mottles and a few pebbles. The substratum to a depth of 98 inches is brown clay loam. It is very gravelly to a depth of 78 inches.

This soil has high available water capacity. It is mildly alkaline to medium acid. Permeability is moderate, natural fertility is high, and content of organic matter is moderate. The root zone is deep, and tilth is good. This soil is subject to occasional brief periods of flooding mostly late in winter and early in spring, but crops are seldom damaged during the growing season. Some areas in depressions have not flooded recently. These areas have such good underground drainage that generally they do not pond. Sometimes, however, the drainage openings become plugged and areas of Nolin soils that have not flooded for years pond for short or long periods. The seasonal high water table is at a depth of 3 to 6 feet.

Included in mapping are small areas of Newark, Lindside, Elk, and Clifty soils. Also included are areas where reaction is strongly acid. The included soils make up about 5 to 10 percent of the map unit. Individual areas are generally less than 3 acres.

Most of the acreage is used intensively for cultivated crops. A few small, irregular areas are used for pasture, hay, or woodland.

This soil is well suited to cultivated crops. High yields can be obtained under good management. The main limitation to the use of this soil as cropland is flooding, but in most years the crops are not damaged. In many areas the soil is poorly suited to winter crops such as small grains because of flooding in winter and early in spring. Stream channel improvement can decrease overflow in some areas. Diversion ditches from adjoining areas in places also reduce overwash. Returning crop residue to the soil and the use of cover crops help to maintain the content of organic matter and the good tilth.

This soil is well suited to pasture and hay, but flooding in spring sometimes damages hay crops. This soil is best suited to grasses and legumes that can withstand short periods of flooding. It is well suited to annual supplemental pasture and hay crops, and high yields can be obtained under good management.

This soil is well suited to woodland use. It is suited to sweetgum, yellow-poplar, eastern white pine, eastern cottonwood, white ash, and cherrybark oak. If seedlings are planted, control of undesirable plants is needed until the seedlings are established.

The potential is good for habitat for openland and woodland wildlife.

This soil is poorly suited to most urban and intensive recreation uses because of the hazard of flooding.

This map unit is in capability class I and woodland suitablity group 1o.

OtA—Otwell silt loam, 0 to 2 percent slopes. This is a nearly level, deep, moderately well drained soil on stream terraces. Areas are 10 to 50 acres.

Typically, the surface layer is dark yellowish brown silt loam to a depth of 8 inches. The subsoil to a depth of 22 inches is strong brown or yellowish brown silty clay loam that has pale brown mottles throughout and light brownish gray mottles in the lower 4 inches. From 22 to 38 inches the subsoil is a fragipan consisting of light brownish gray silty clay loam. From 38 to 60 inches it is strong brown silty clay loam that has light brownish gray mottles.

This soil is medium in natural fertility and moderate in content of organic matter. Reaction is strongly acid or very strongly acid in unlimed areas. The available water capacity is moderate. Permeability is moderate above the fragipan and very slow in the fragipan. The soil is easy to till and can be worked throughout a wide range in moisture content without clodding or crusting. Because of the fragipan the water table is at a depth of 18 to 30 inches during wet seasons. The root zone is moderately deep. The fragipan restricts root growth.

Included in mapping are some areas that may be flooded during unusually high floods and small areas of Elk and Lawrence soils.

On most of the acreage this soil is used for cultivated crops and for hay and pasture in rotation. In small areas it is used as woodland.

This soil is well suited to most of the cultivated crops and to hay and pasture plants commonly grown in the survey area. Deep-rooted crops, such as alfalfa, tend to die out after 2 to 3 years because of the seasonal high water table caused by the fragipan. Erosion is not a hazard, and this soil can be cultivated year after year. Management practices that increase and maintain the content of organic matter and maintain good tilth are needed.

This soil is suited to woodland use. It is suited to yellow-poplar, white ash, and eastern white pine. If seedlings are planted, control of undesirable plants is needed until the seedlings are established.

The potential of this soil for use as habitat for openland and woodland wildlife is good.

This soil is suited to most urban and intensive recreation uses, but the wetness caused by the seasonal water table is a limitation to those uses. Some lower-lying areas may be flooded during unusually high floods.

This map unit is in capability subclass IIw and woodland suitability group 3o.

OtB—Otwell silt loam, 2 to 6 percent slopes. This is a deep, gently sloping, moderately well drained soil. It is on stream terraces. Areas range from 4 to 40 acres.

Typically, the surface layer is dark yellowish brown silt loam 8 inches thick. The subsoil to a depth of 22 inches

is strong brown to yellowish brown silty clay loam that has pale brown mottles throughout and light brownish gray mottles in the lower 4 inches. From 22 to 38 inches the subsoil is a fragipan consisting of light brownish gray silty clay loam that is mottled brown and strong brown. Between 38 and 60 inches it is strong brown silty clay loam that has light brownish gray mottles.

This soil is medium in natural fertility and moderate in content of organic matter. Permeability is moderate above the fragipan and very slow in the fragipan. Reaction is strongly acid or very strongly acid in unlimed areas. The available water capacity is moderate. The root zone is moderately deep. This soil is easy to till and can be worked throughout a wide range in moisture content without clodding or crusting. The fragipan causes a seasonal water table at a depth of 18 to 30 inches during wet seasons.

Included in mapping are some areas that may be flooded during unusually high floods and small areas of Elk and Lawrence soils.

On most of the acreage this soil is used for cultivated crops or for hay and pasture in rotation. In some areas it is used as woodland.

This soil is well suited to most of the cultivated crops and to hay and pasture plants commonly grown in the area. Deep-rooted crops, such as alfalfa, tend to die out after 2 to 3 years because of the seasonal high water table caused by the fragipan. The erosion hazard is moderate. Conservation practices and cropping systems that control erosion are needed. Using grasses and legumes in the cropping system and returning crop residue to the soil help to control erosion and to maintain the content of organic matter and the good tilth.

This soil is suited to woodland use. It is suited to yellow-poplar, white ash, and eastern white pine. If seedlings are planted, control of undesirable plants is needed until the seedlings are established.

The potential of this soil for use as habitat for openland and woodland wildlife is good.

This soil is suited to most urban and intensive recreation uses, but it is limited for those uses mainly by the wetness caused by the seasonal high water table and very slow permeability in the fragipan. In some low-lying areas the hazard of flooding during high floods is a limitation.

This map unit is in capability subclass IIe and woodland suitability group 3o.

PcC3—Pembroke-Crider complex, 6 to 12 percent slopes, severely eroded. The soils in this complex are deep, well drained, and sloping. They are commonly on ridgetops and side slopes in karst areas. The plow layer is mostly subsoil. Many areas have rills or gullies. These soils are so intermingled that they could not be mapped separately at the scale used. Areas of this complex are about 5 to 40 acres. Areas of each soil are 1 to 3 acres.

About 60 percent of the complex is Pembroke soils. Typically, the surface layer is reddish brown silty clay loam about 6 inches thick. The subsoil to a depth of 30 inches is reddish brown silty clay loam. From 30 to 42 inches it is red silty clay, and from 42 to 75 inches or more it is dark red clay.

The Pembroke soils are moderate in natural fertility and low in content of organic matter. Tilth is fair because of the low content of organic matter and silty clay loam texture of the plow layer. At times a crust forms on the surface and causes poor germination of seeds and seedling mortality. Tillage should be done at moisture levels that will not cause clodding. These soils are medium acid or strongly acid in unlimed areas. Permeability is moderate, and the available water capacity is high. The root zone is deep. Plant response is good to additions of lime and fertilizer. The lower part of the subsoil is moderate in shrink-swell potential.

About 30 percent of the complex is Crider soils. Typically, the surface layer is dark yellowish brown silt loam about 8 inches thick. The subsoil to a depth of 24 inches is brown silty clay loam. From 24 to 54 inches it is yellowish red to red silty clay loam, and from 54 to 66 inches it is dark red silty clay.

The Crider soils have moderate permeability. The available water capacity is high. Reaction is medium acid or strongly acid throughout in unlimed areas. The natural fertility is medium. The plow layer is low in content of organic matter and has fair tilth. It tends to crust when dry, but it is easy to work. The root zone is deep. The lower part of the subsoil is moderate in shrink-swell potential.

Included in mapping are small areas of Nolin, Lindside, and Newark soils in small basins and in depressions. A few small areas of Fredonia, Hammack, and Nicholson soils are included in some areas.

On most of the acreage these soils are used for pasture, hay, and cultivated crops. In a few areas they are used as woodland.

These soils are poorly suited to intensive use as cultivated cropland mainly because of the effects of past erosion. They are suited to occasional cultivation. They are suited to all the crops commonly grown in the survey area, but yields of these crops are commonly lower than in uneroded areas of these soils. If these soils are cultivated, the hazard of further erosion is very severe. Because of the irregularity of slope in most areas some erosion control practices are difficult to apply. No-tillage, contour tillage, stripcropping, use of cover crops, and using grasses and legumes in the cropping system help to control erosion. Returning all crop residue to the surface also helps to control erosion, increase the content of organic matter, and improve tilth.

These soils are well suited to pasture and hay crops and to deep-rooted grasses and legumes. Moderately high yields of these crops can be obtained under a high level of management. In areas where some erosion control methods are difficult to use these soils are better suited to pasture and hay. The maintenance of optimum fertility level and rotation grazing help to maintain good cover, increase yields, and control erosion.

These soils are well suited to woodland use. They are suited to yellow-poplar, black walnut, white ash, eastern white pine, shortleaf pine, and loblolly pine. If seedlings are planted, control of competition from undesirable plants is needed until the seedlings are established.

The potential of the soils for use as habitat for openland and woodland wildlife is good.

These soils are suited to urban development and to intensive recreation uses. The steepness of slope is the main limitation to most uses. The shrink-swell potential of the clayey subsoil is a limitation to some uses.

This complex is in capability subclass IVe and woodland suitability group 1o.

Pg—Pits, gravel. This miscellaneous area consists of excavations from which sand and gravel have been removed for use in building roads and foundations, for making concrete, or for other uses. The removal of the very gravelly Coastal Plain material creates a pit that is about 35 feet in depth and that generally is 1 to 5 acres or more (fig. 9). These pits have vertical walls and flat bottoms.

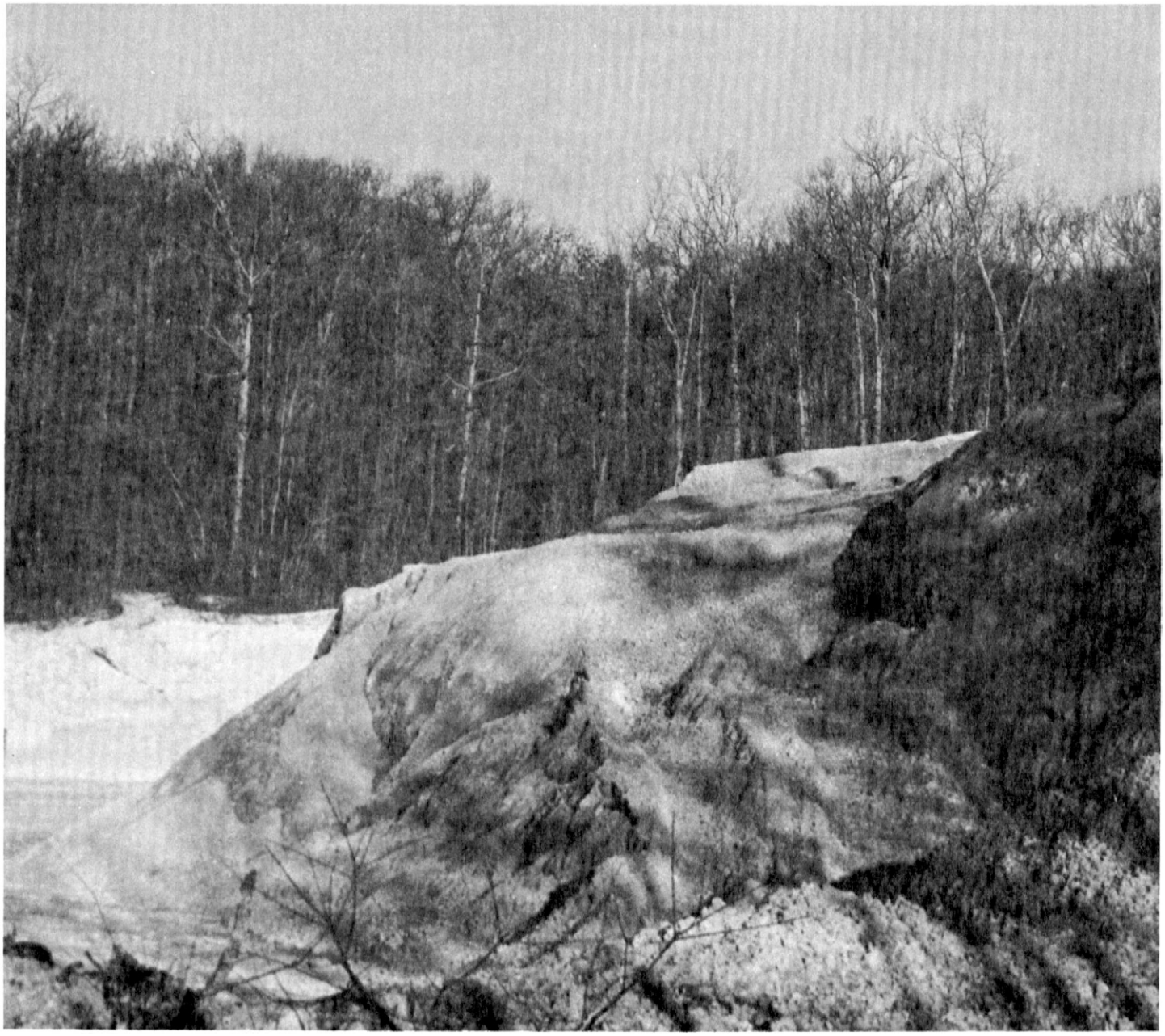


Figure 9.—Gravel pit in an area of Saffell and Brandon soils. Gravel is mined and used for construction of roads and other projects.

Around the edge of some pits there are mounds, up to 4 feet high, of the silty and gravelly soil material that covered the gravelly material needed for construction. Well rounded gravel makes up 60 to 90 percent of the floor and walls of the pits. The pebbles range from 2 millimeters to 10 inches in diameter but average about 1 inch. In the upper 2 feet the fine earth interstitial material between the gravel is silt loam or loam, and in the lower layers it is sandy loam, sandy clay loam, or in places, sandy clay or sand. In some pits the gravel is stratified, and in a few places, it is cemented to conglomerates of iron and manganese oxides. If Coastal Plain material is of Cretaceous age (Tuscaloosa Formation), the gravel and fine earth part is light gray and there are brown and red mottles. If the Coastal Plain material is of Tertiary age (continental deposits), the gravel is brown and there are red and gray mottles. In areas of continental deposits the rounded chert also contains some quartzite. In many gravel pits, Tertiary formations overlie Cretaceous formations. All the material in and around gravel pits is strongly or very strongly acid.

Some pits are still mined for gravel and, therefore, are getting larger. Some pits that are no longer mined are naturally revegetated with bushes, briars, and small trees. Most pits do not hold water or hold it only for short periods. Some gravel pits have been mined down to a nonpermeable material and hold water. The pits that hold water all year are shown as water areas on the map.

Near the entrance to the Land-Between-the-Lakes, on U.S. Highway 68 near Barkley Lake, a gravel pit has been graded and seeded to grasses and legumes for esthetic purposes.

Included in mapping are landfill in the Land-Between-the-Lakes area and sand pits in areas where Lexington soils are mapped.

On the map, the special symbol for small gravel pits is also used for iron ore pits and sand pits.

Pt—Pits, quarries. This miscellaneous area consists of open excavations that expose the underlying limestone bedrock, which is used for construction or for agriculture. The pits are about 100 feet deep. Included are mounds of mixed rock and soil material or mounds of limestone graded into sizes for riprap, road material, and agricultural use. These mounds range up to 25 feet in height and cover several acres.

There are two quarries in Lyon and Trigg Counties. One, near Gerulean, was abandoned prior to 1962. It is in the Renault Limestone Formation. This pit is filled with water and is shown on the map as 15 acres of water. Nearly all of the limestone piles for construction material and the agricultural limestone have been removed, and mounds of mixed rock and soil material remain. The area of spoil material takes in 36 acres. This spoil material varies from almost no rock to nearly all rock. The rock ranges up to 4 feet in length. The fine earth part is dark red to light gray silt loam to clay, but it is mostly reddish brown silty clay loam that has gray mottles and is neutral or alkaline.

The other quarry, near Canton, is in the Warsaw Limestone Formation and is presently active. It takes in 91 acres.

Ro—Robertsville silt loam. This is a deep, nearly level, and poorly drained soil. It is on slightly concave uplands and stream terraces. Most areas are 5 to 60 acres. The slope range is 0 to 2 percent.

Typically, the surface layer is grayish brown silt loam about 6 inches thick. The subsoil to a depth of 26 inches is light grayish brown silt loam that has yellowish brown mottles. From 26 to 48 inches it is a fragipan of light brownish gray silty clay loam that has olive brown mottles. The substratum to a depth of 62 inches is light brownish gray silt loam that has yellowish brown mottles and a few chert fragments.

This soil is low in natural fertility and content of organic matter. Permeability is moderate above the fragipan and slow in the pan. The fragipan also hinders root growth and causes a seasonal high water table within 1 foot of the surface during wet seasons. The root zone is moderately deep to the fragipan. The soil has good tilth and can be worked throughout a wide range in moisture content without clodding or crusting. The available water capacity is moderate. Most areas on stream terraces are subject to occasional brief periods of flooding. Most areas on uplands are ponded for brief periods.

Included in mapping are small areas of Lawrence and Otwell soils on stream terraces and small areas of Lawrence, Nicholson, and Sadler soils on uplands. Also included are small areas of Newark, Lindside, and Nolin soils.

Much of the acreage of this soil is in hardwood forest. In some areas the soil is cultivated or is used for hay and pasture.

If this soil is drained, it is suited to cultivated crops that have a short growing season and can tolerate wetness. It is better suited to crops such as soybeans, corn, and dark tobacco than to burley tobacco, wheat, barley, and oats. Artificial drainage helps to increase the length of season for field operations and the yields of most crops. Open-ditch drainage is preferred to subsurface drains because of slow permeability in the fragipan. The yields of most crops are limited because of the moderately deep root zone and the moderate available water capacity.

This soil is suited to pasture and hay plants that tolerate wetness. It is well suited to tall fescue and reed canarygrass and poorly suited to alfalfa.

This soil is well suited to woodland use. It is suited to sweetgum, American sycamore, and loblolly pine. The equipment limitations, seedling mortality, and plant competition are the main concerns in management.

Equipment use is restricted mainly to dry periods. Strong, healthy, properly planted seedlings protected from plant competition are most likely to survive.

This soil has fair potential for use as habitat for woodland wildlife and good potential for use as habitat for wetland wildlife.

This soil is poorly suited to most urban uses and recreation uses. Wetness and flooding are the main limitations to these uses.

This map unit is in capability subclass IVw and woodland suitability group 1w.

SaA—Sadler silt loam, 0 to 2 percent slopes. This nearly level, deep, moderately well drained soil is on uplands in the northeastern part of Trigg County. Most areas are 8 to 40 acres.

Typically, the surface layer is brown silt loam 8 inches thick. The subsoil to a depth of 24 inches is yellowish brown silt loam. From 24 to 26 inches it is gray silt loam. From 26 to 42 inches it is a fragipan of brown silt loam that is mottled with gray. The substratum to a depth of 60 inches or more is yellowish brown fine sandy loam.

This soil is medium in natural fertility. The content of organic matter is moderate, and the soil is strongly acid or very strongly acid in unlimed areas. The soil is easy to till and can be worked throughout a wide range in moisture content. The root zone is moderately deep. The fragipan limits the effective rooting depth and causes a seasonal water table at a depth of 18 to 24 inches. The available water capacity is moderate. Permeability is moderate above the fragipan and slow in the pan.

Included in mapping are small areas of Zanesville and Lawrence soils. Included soils make up 5 to 15 percent of the map unit. Individual areas are generally less than 2 acres.

On most of the acreage this soil is used for cultivated crops and for hay and pasture in rotation. In a few areas it is forested.

This soil is well suited to cultivated crops tolerant of slight wetness. It is best suited to shallow-rooted crops. The seasonal water table delays planting in some years. Returning crop residue to the soil, using cover crops, and including grasses and legumes in the cropping system help to maintain the content of organic matter and good tilth.

This soil is well suited to pasture and hay crops. The moderate depth of the root zone, however, limits the varieties of plants that can be grown. For example, this soil is not well suited to some deep-rooted plants such as alfalfa. Maintenance of optimum fertility levels and rotation grazing help to increase yields and to maintain the stand of pasture plants.

This soil is suited to woodland use. It is suited to yellow-poplar, shortleaf pine, eastern white pine, and Virginia pine. If seedlings are planted, competition from undesirable plants should be controlled until the seedlings are established.

This soil has good potential for use as openland and woodland wildlife habitat.

This soil is suited to most urban and intensive recreation uses, but it is limited for those uses mainly by the slow permeability of the fragipan. For some uses, this limitation is difficult to overcome.

This map unit is in capability subclass IIw, and woodland suitability group 3o.

SaB—Sadler silt loam, 2 to 6 percent slopes. This gently sloping, deep, moderately well drained soil is on uplands in the northeastern part of Trigg County. Most areas are 10 to 30 acres in size.

Typically, the surface layer is brown silt loam 8 inches thick. The subsoil to a depth of 24 inches is yellowish brown silt loam. From 24 to 26 inches it is gray silt loam. From 26 to 42 inches it is a fragipan of brown, very firm, compact, brittle silt loam that is mottled with gray. The substratum to a depth of 60 inches or more is yellowish brown fine sandy loam.

This soil is medium in natural fertility. The content of organic matter is moderate, and the soil is strongly or very strongly acid in unlimed areas. Permeability is moderate above the fragipan and slow in the pan. The available water capacity is moderate. The fragipan limits the effective rooting depth and causes a seasonal water table at 18 to 24 inches. The root zone is only moderately deep. The soil is easy to till and can be worked throughout a wide range in moisture content.

Included in mapping are small areas of Zanesville and Lawrence soils on uplands and small areas of Nolin, Lindside, and Newark soils along small branches. The included soils make up 10 to 20 percent of this map unit. Individual areas are generally less than 3 acres.

On most of the acreage this soil is used for cultivated crops and hay and pasture in rotation. In a few areas it is forest.

This soil is well suited to cultivated crops. It is best suited to shallow-rooted crops. The seasonal water table delays planting in some years. The hazard of erosion is moderate if the soil is cultivated. No-tillage, contour tillage, stripcropping, using cover crops, and growing grasses and legumes in the cropping system can slow surface runoff and help to control erosion. Returning crop residue to the soil, using cover crops, and growing grasses and legumes in the cropping system also help to maintain the content of organic matter and good tilth.

This soil is well suited to pasture and hay crops. The moderate rooting depth, however, limits the variety of plants that can be grown. For example, this soil is not well suited to some deep-rooted plants such as alfalfa. Maintenance of optimum fertility levels and rotation grazing help to increase the yields and extend the life of pasture stands.

This soil is suited to woodland use. It is suited to yellow-poplar, shortleaf pine, eastern white pine, and Virginia pine. If seedlings are planted, competition from undesirable plants should be controlled until seedlings are established.

This soil has good potential for use as habitat for openland and woodland wildlife.

This soil is suited to most urban and intensive recreation uses, but it is limited for those uses mainly by the slow permeability of the fragipan and wetness. For some uses, these limitations are difficult to overcome.

This map unit is in capability subclass IIe and woodland suitability group 3o.

SgC—Saffell very gravelly silt loam, 6 to 12 percent slopes. This is a deep, well drained, sloping soil. It is on bench-like areas below steep hillsides and above first bottoms. It is between Lake Barkley and Kentucky Lake and in the southern part of Trigg County, east of Lake Barkley. Most areas range from 2 to 20 acres.

Typically, the surface is covered with lichens. The surface layer is dark grayish brown very gravelly silt loam about 2 inches thick. The subsurface layer is yellowish brown very gravelly silt loam about 5 inches thick. The subsoil to a depth of 15 inches is strong brown gravelly loam. From 15 to 44 inches it is reddish brown and strong brown very gravelly clay loam, and from 44 to 70 inches it is strong brown very gravelly sandy clay loam.

This soil is low in natural fertility and content of organic matter. It is strongly acid to very strongly acid in unlimed areas. Permeability is moderate, and the available water capacity is low. The soil is difficult to till because of the very gravelly surface layer. The root zone is deep. The very gravelly subsoil, however, is low in plant nutrients.

Included in mapping are small areas of Saffell gravelly silt loam and Brandon soils on the bench-like toe slopes and Clifty soils on the first bottoms. The included soils make up about 5 to 10 percent of this map unit. Individual areas generally are less than 2 acres.

Many areas of this soil are cleared because the benches are more like the adjoining bottom lands than the steep hillsides, but most areas are often left idle if the adjacent first bottoms are cultivated.

This soil is poorly suited to cultivated crops because of the very gravelly surface layer and low available water capacity. Yields of most crops are low. The hazard of erosion is severe if this soil is cultivated.

This soil is suited to pasture and meadow plants, but yields are low. It provides some grazing early in spring and at other times when there is plenty of moisture. Dry weather quickly limits the soil for forage production.

This soil is suited to woodland use. It is suited to loblolly pine, shortleaf pine, and eastern redcedar. Soil-related problems of use and management are not significant on this soil.

The potential is fair for openland and woodland wildlife habitat.

This soil is suited to most urban uses and intensive recreation uses, but it is limited for those uses mainly by the high content of gravel and steepness of slope.

This map unit is in capability subclass IVs and woodland suitability group 4f.

SgF—Saffell very gravelly silt loam, 20 to 60 percent slopes. This is a deep, well drained, steep to very steep soil. It is on side slopes on highly dissected Coastal Plain uplands. The side slopes mostly face south or west. Most areas are 10 to 100 acres.

Typically, the surface is covered with a growth of lichens. The surface layer is dark grayish brown very gravelly silt loam about 2 inches thick. The subsurface layer is yellowish brown very gravelly silt loam about 5 inches thick. The subsoil to a depth of 15 inches is strong brown gravelly loam. From 15 to 44 inches it is reddish brown and strong brown very gravelly clay loam, and from 44 to 70 inches it is very gravelly sandy clay loam (fig. 10).

This soil is low in natural fertility and content of organic matter. It is strongly acid to very strongly acid. Permeability is moderate, and the available water capacity is low. The soil is difficult to till because of the very gravelly surface layer. The root zone is deep. The very gravelly subsoil, however, is low in plant nutrients.

Included in mapping are small areas of Brandon and Clifty soils. Also included are small areas where there are no very gravelly Coastal Plain deposits or where the deposits are thin or absent and areas of soils that developed in residuum of cherty limestone less than 3 feet from the surface or at the surface. In these areas and in some other included areas the fine earth part between the chert or gravel below a depth of about 3 feet is clayey. In places there are ledges of conglomerate and ferruginuous sandstone on the surface and discontinuous layers in the subsoil.

Nearly all of this soil is used as woodland.

This soil is poorly suited to cultivated crops, small grains, and meadow and pasture plants. The main limitations to farming are the steepness of slope, the high content of gravel, the low available water capacity, and a very severe hazard of erosion.

The potential is fair for woodland wildlife habitat.

This soil is suited to loblolly pine, shortleaf pine, and eastern redcedar. The main concerns of woodland management are the equipment limitation and the hazard of erosion.

This soil is poorly suited to urban uses and intensive recreation uses, mainly because of the steepness of slope. The high content of gravel is also a limitation to some uses. This soil is used as a source of gravel for road construction and other uses.

This map unit is in capability subclass VIIs and woodland suitability group 4f.

ZaB—Zanesville silt loam, 2 to 6 percent slopes. This deep, gently sloping, well drained to moderately well drained soil is on uplands in the northeastern section of Trigg County. Most areas range from 5 to 50 acres.

Typically, the surface layer is brown silt loam about 6

Figure 10.—Profile of Saffell very gravelly silt loam, 20 to 60 percent slopes.

inches thick. The subsoil to a depth of 19 inches is strong brown silty clay loam. From 19 to 29 inches it is yellowish brown silty clay loam that has pale brown mottles in the lower part. From 29 to 42 inches it is a fragipan of yellowish brown silty clay loam that has mottles of light brownish gray and strong brown. The substratum, from 42 to 65 inches, is yellowish brown clay loam that contains light brownish gray and white mottles and a few sandstone and siltstone fragments. Sandstone bedrock underlies the substratum.

This soil is medium in natural fertility and moderate in content of organic matter. It is strongly acid or very strongly acid throughout except where the surface has been limed. Permeability is moderate above the fragipan and moderately slow to slow in it. The fragipan hinders root development and causes a perched water table at a

depth of 24 to 36 inches. The root zone is moderately deep. The available water capacity is moderate. This soil has good tilth and can be worked throughout a wide range in moisture content.

Included in mapping are small areas of Sadler, Nicholson, Wellston, Frondorf, and Weikert soils. Included soils make up less than 15 percent of this map unit. Individual areas are less than 3 acres.

On most of the acreage this soil is used for cultivated crops and for hay and pasture in rotation. In some areas it is used as woodland.

This soil is well suited to cultivated crops. It is suited to all the commonly grown cultivated crops and small grains. Erosion is a moderate hazard if the soil is cultivated. No-tillage, contour tillage, stripcropping, using cover crops, and growing grasses and legumes in the cropping system can slow surface runoff and help to control erosion. Returning crop residue to the soil also helps to control erosion and maintain the content of organic matter and good tilth. The fragipan restricts the growth of roots and the movement of air and water.

This soil is well suited to pasture and hay crops. These crops fit well in a rotation system with grain crops. They help to control erosion and maintain good tilth. On this soil, alfalfa stands generally last longer than they do on Sadler soils but not as long as on soils that do not have a fragipan.

This soil is also well suited to woodland use. It is suited to eastern white pine, shortleaf pine, loblolly pine, and Virginia pine. If seedlings are planted, competition from undesirable plants should be controlled until the seedlings are established. Plant competition is the only significant limitation to woodland use or management.

This soil has good potential for use as openland and woodland wildlife habitat.

This soil is well suited to urban and intensive recreation uses, but it is limited for those uses because of the wetness caused by the perched water table and slow permeability of the fragipan.

This map unit is in capability subclass IIIe and woodland suitability group 3o.

ZaC—Zanesville silt loam, 6 to 12 percent slopes. This deep, sloping, well drained to moderately well drained soil is on uplands in the northeastern part of Trigg County. Most areas range from 15 to 50 acres.

Typically, the surface layer is brown silt loam about 6 inches thick. The subsoil to a depth of 19 inches is strong brown silty clay loam. From 19 to 29 inches it is yellowish brown silty clay loam that has pale brown mottles in the lower part. From 29 to 42 inches it is a fragipan of yellowish brown silty clay loam that is mottled with light brownish gray and strong brown. The substratum, from 42 to 65 inches, is yellowish brown clay loam mottled light brownish gray and white. Sandstone bedrock underlies the substratum.

This soil is medium in natural fertility and moderate in content of organic matter. It is strongly acid or very strongly acid throughout except where the surface layer has been limed. Permeability is moderate above the fragipan and moderately slow to slow in it. The fragipan hinders root development and causes a perched water table at a depth of 24 to 36 inches. The root zone is only moderately deep. The available water capacity is moderate. The soil has good tilth and can be worked throughout a wide range in moisture content.

Included in mapping are small areas of Sadler, Nicholson, Wellston, and Frondorf soils on uplands and Nolin, Lindside, and Newark soils on small branch bottoms. Also included are severely eroded areas where the surface layer consists mainly of subsoil material. Included soils make up 15 percent of the map unit. Individual areas are less than 3 acres.

On most of the acreage this soil is used for cultivated crops and for hay and pasture in rotation. In some areas it is used as woodland.

This soil is suited to all the cultivated crops commonly grown in the area. Erosion is a severe hazard if cultivated crops are grown. Minimum tillage, using cover crops, returning crop residue to the soil, and growing grasses and legumes in the cropping system help to slow runoff and control erosion. Most of these practices also help to maintain the content of organic matter and the good tilth.

This soil is well suited to hay and pasture crops. It is better suited to these crops than to cultivated crops because of the erosion hazard. Seeding late in summer or early in fall generally results in better stands, quicker cover, less competition from undesirable plants, and better control of erosion. Alfalfa stands last longer on this soil than they do on the Sadler soils but not as long as on soils that do not have a fragipan.

This soil is suited to woodland use. It is suited to eastern white pine, shortleaf pine, loblolly pine, and Virginia pine. If seedlings are planted, competition from undesirable plants should be controlled until the seedlings are established. Plant competition is the only significant limitation to woodland use or management.

This soil has good potential for use as habitat for openland and woodland wildlife.

This soil is suited to urban uses and intensive recreation uses. Slope and wetness are limitations to most uses. Slow permeability in the fragipan is a limitation to some uses.

This map unit is in capability subclass IIIe and woodland suitability group 3o.

use and management of the soils

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

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

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

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

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

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

crops and pasture

Lonnie R. Stewart, district conservationist, Soil Conservation Service, assisted in writing this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed soil map units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

More than 120,000 acres in the survey area was used for crops and pasture in 1967 (*10*). Of this total, 43,000 acres was used for permanent pasture; 27,000 acres was used for row crops, mainly corn; 4,500 acres was used for close-growing crops, mainly wheat and barley; and 20,000 acres was used for hay and pasture in rotation. The rest was mostly idle cropland.

The soils in the survey area have good potential for increased production of food. In Lyon County about 8,000 acres of potentially good cropland is currently used as woodland, and about 5,000 acres is used as pasture, and in Trigg County, about 16,000 acres of potentially good cropland is used as woodland, and 28,000 acres is used as pasture. Those acreages do not include Federal land that is potentially good cropland. Food production could also be increased considerably by extending the latest crop production technology to all cropland in the survey area. This soil survey can help facilitate the application of such technology.

The acreage in crops and pasture is decreasing. In 1958, Federal noncropland covered about 34,000 acres in Lyon County and 55,000 acres in Trigg County. By 1967 it covered about 90,000 acres in Lyon County and 125,000 acres in Trigg County. In 1958 urban and built-up land covered about 3,300 acres in Lyon County and about 4,300 acres in Trigg County. By 1967, it covered about 8,000 acres in Lyon County and 20,000 acres in Trigg County. The amount of urban and built-up land is growing at the rate of about 2,000 acres per year. The use of this soil survey to help make land use decisions that will influence the future role of farming in the survey area is discussed in the section "General soil map units."

Erosion is the major concern on about three-fourths of the cropland and pasture in the survey area. If the slope is more than 2 percent, erosion is a hazard.

Erosion is damaging for two reasons. First, productivity is reduced as the surface layer is lost and part of the subsoil is incorporated into the plow layer. Loss of the surface layer is especially damaging on soils that have a

clayey subsoil, for example, Baxter, Fredonia, and Hagerstown soils. It is especially damaging also on soils that have a layer in or below the subsoil that limits the depth of the root zone. The fragipan in Lax, Nicholson, Otwell, and Sadler soils or the bedrock underlying Fredonia, Frondorf, Weikert, and Wellston soils are examples. Erosion also reduces productivity on soils that tend to be droughty, for example, Saffell gravelly silt loam.

Second, erosion on farmland results in the sedimentation of streams. Control of erosion minimizes the pollution of streams by sediment and improves the quality of water for municipal use, for recreation, and for fish and wildlife.

In many sloping fields, tilling or preparing a good seedbed is difficult on clayey or hardpan spots because the original friable surface layer has been eroded away. Such spots are common in areas of sloping Brandon, Hagerstown, Hammack, Baxter, Lexington, Nicholson, and Pembroke soils.

Erosion control practices provide a protective surface cover, reduce runoff, and increase infiltration. A cropping system that keeps vegetative cover on the soil for extended periods can hold soil loss to an amount that will not reduce the productive capacity of the soil. On livestock farms, requiring pasture and hay, the legumes and grasses in the cropping system reduce erosion on sloping land and improve tilth for the following crop. The legumes also provide nitrogen.

Terraces and diversions reduce the length of slope and reduce soil erosion. They are practical on deep, well drained, gently sloping and sloping soils or on moderately well drained soils that have single slopes.

Contouring and contour stripcropping are excellent erosion control practices in the survey area. They are best adapted to soils that have smooth uniform slopes.

In most areas of the sloping Crider, Pembroke, Hammack, and Baxter soils the slopes are so short and complex that contour tillage or terracing is not practical. On these soils, a cropping sytem that provides substantial vegetative cover is required to control erosion unless minimum tillage is practiced. Minimizing tillage and leaving crop residue on the surface help increase infiltration and reduce runoff and the hazard of erosion. These practices are suitable to most soils in the survey area.

Information on the design of erosion control practices for each kind of soil is contained in the technical guide available in local offices of the Soil Conservation Service.

Drainage is the major management need on about 4 percent of the acreage used for crops and pasture in the survey area. Only Melvin and Robertsville soils are so wet that the production of crops common to the area is generally not possible without drainage.

The design of both surface and subsurface drainage systems varies with the kind of soil. A combination of surface drainage and tile drainage is needed in most areas of the poorly drained and very poorly drained soils used for row cropping. Drains have to be more closely spaced in soils that are slowly permeable than in more permeable soils. Tile drainage is very slow in Lawrence and Robertsville soils. Obtaining adequate outlets for tile drainage systems is difficult in many areas.

Fertility ranges from high to low on upland soils. On the uplands all the soil except that in the lower part of Fredonia and Hagerstown is naturally acid. The soils on flood plains, such as Nolin, Lindside, Newark, and Melvin soils, range from slightly acid to mildly alkaline and are naturally higher in plant nutrients than most soils on uplands. On the uplands, Crider and Pembroke soils have higher fertility in the natural state than other upland soils.

Many soils on uplands are very strongly acid in their natural state. If they have never been limed, applications of ground limestone are required to raise the pH level sufficiently for good growth of alfalfa and other crops that grow only on nearly neutral soils. Available phosphorus and potash levels are naturally low in most of these soils. On all soils, additions of lime and fertilizer should be based on the results of soil tests, on the need of the crop, and on the expected level of yields. The Cooperative Extension Service can help in determining the kinds and amounts of fertilizer and lime to apply.

Tilth is an important factor in the germination of seeds and in the infiltration of water. Soils in good tilth are granular and porous.

Most of the soils used for crops have a surface layer of silt loam that is light in color and moderate or low in content of organic matter. Generally the structure of such soils is weak, and intense rainfall causes the formation of a crust on the surface. The crust is hard when dry and is nearly impervious to water. As a result runoff increases. Regular additions of crop residue, manure, and other organic material can help improve soil structure and reduce crust formation.

Fall plowing is generally not a good practice on the light colored soils that have a surface layer of silt loam because of the crust that forms in winter and spring. Many of these soils are commonly as dense and hard at planting time after fall plowing as they were before they were plowed. Also, about three-fourths of the cropland consists of sloping soils that are subject to damaging erosion if they are plowed in the fall.

The soils and climate of the survey area are suited to many field crops that are not commonly grown. Corn, burley tobacco, dark-fired tobacco, and soybeans are the main row crops. Grain sorghum, sunflowers, peanuts, potatoes, and similar crops can be grown if economic conditions are favorable.

Wheat and barley are the common close-growing crops. Rye, oats, and crambre can be grown. Fescue, orchardgrass, timothy, red clover, white clover, and lespedezas are grown for seed.

A small acreage throughout the survey area is used for melons, strawberries, raspberries, sweet corn,

tomatoes, peppers, and other vegetables and small fruits.

Most of the well drained soils in the survey area are suited to orchards and nursery plants. Soils in low-lying positions, where frost is frequent and air drainage is poor, however, generally are poorly suited to early vegetables, small fruits, and orchards.

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

In general, the soils in the survey area that are well suited to crops are also well suited to urban development. The data about specific soils in this soil survey can be used in planning future land use patterns. The potential of a soil for use as farmland should be weighed against its potential for nonfarm use.

yields per acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green-manure crops; and harvesting that insures the smallest possible loss.

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

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

land capability classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor does it consider possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for woodland, and for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit (*19*). Only class and subclass are used in this survey. These levels are defined in the following paragraphs.

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

Class I soils have slight limitations that restrict their use.

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

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

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

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

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

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

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

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

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

The acreage of soils in each capability class and subclass is shown in table 6. The capability classification

of each map unit is given in the section "Detailed soil map units."

woodland management and productivity

Charles A. Foster, staff forester, Soil Conservation Service, assisted in writing this section.

Lyon and Trigg Counties are in the western mesophytic forest region. The oak-hickory forest type is the most extensive in the survey area, covering approximately 68 percent of the 223,200 acres of commercial forest land.

Much of the forest land is owned by agencies of the federal government. The Tennessee Valley Authority owns 46,000 acres in the Land-Between-the-Lakes in Lyon County and about 65,000 acres in the Land-Between-the-Lakes in Trigg County. The Fort Campbell Military Reservation in Trigg County encompasses some 26,000 acres. Also, the Corps of Engineers owns land near Lake Barkley in both counties. Most of the federally owned land is forest (*4*) and is under some type of management. It is used for wood production, recreation, or wildlife habitat.

The privately owned forest land is in small holdings averaging about 24 acres and is essentially unmanaged. Tree growth averages 33 cubic feet per acre per year, which is well below the potential—50 cubic feet or more—of most sites. About 30 percent of the privately owned tracts of forest land are part of a larger tract of farmland. The stands are not well stocked with desirable trees of high quality, and the ownership of many tracts changes frequently, usually about every 10 years.

With proper management, tree growth, stocking, and quality can be improved. The removal of low quality trees in fully stocked and understocked stands of all sizes and the regeneration of sawtimber stands after harvest are needed. Soil surveys are useful in identifying the most productive forest land, the soil limitations for management, and the species to favor or plant.

The wood industry in Lyon and Trigg Counties consists primarily of five commercial sawmills and one bolt mill. These mills produce rough lumber, crossties, wood chips, pallet parts, dimension stock, and handle blanks. Logs and standing trees from the survey area are purchased by lumber mills in adjoining counties.

Table 7 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination (woodland suitability) symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

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

In table 7, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

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

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

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

Ratings of *plant competition* indicate the degree to which undesirable plants are expected to invade where there are openings in the tree canopy. The invading plants compete with native plants or planted seedlings. A rating of *slight* indicates little or no competition from other plants; *moderate* indicates that plant competition is expected to hinder the development of a fully stocked stand of desirable trees; *severe* indicates that plant competition is expected to prevent the establishment of a desirable stand unless the site is intensively prepared, weeded, or otherwise managed to control undesirable plants.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. Site index was determined at age 30 for eastern cottonwood, age 35 for American sycamore, and age 50 for all other species. The site index applies to fully stocked, even-aged, unmanaged stands (*5, 6, 14, 16, 21*). Commonly grown trees are those that woodland

managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

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

recreation

Recreation is an important land use in Lyon and Trigg Counties. Lake Barkley and Kentucky Lake attract people who are interested in water sports and camping.

The Land-Between-the-Lakes area, which is between Kentucky Lake and Lake Barkley, is managed by the Tennessee Valley Authority as a demonstration area for outdoor recreation and environmental education. Of this area, 46,500 acres is in Lyon County and 65,500 acres is in Trigg County. The rest is in Stewart County, Tennessee.

The recreational activities available in the Land-Between-the-Lakes area attract thousands of tourists to Lyon and Trigg Counties every year. On the east side of Lake Barkley, many areas are being developed for tourist accommodations, vacation homes, permanent residences, and commercial enterprises.

The soils of the survey area are rated in table 8 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 8, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 8 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 11 and interpretations for dwellings without basements and for local roads and streets in table 10.

Camp areas require site preparation such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

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

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

wildlife habitat

William H. Casey, biologist, Soil Conservation Service, assisted in writing this section.

The wildlife population of Lyon and Trigg Counties consists of an estimated 47 species of mammals, 45 species of reptiles and amphibians, and 99 species of birds that commonly nest in the area. Many of the more than 200 species of non-native migratory birds that normally are in Kentucky each year can be found in this survey area.

Certain members of the bird population deserve special mention. Although they probably no longer nest in the area, the golden eagle and the bald eagle congregate here in the winter. They are attracted to the Kentucky Lake and Lake Barkley, where food is usually plentiful. Bird watchers come from miles around to see these two birds, especially the bald eagle, which is on the list of endangered species.

The Cliff swallow, although not an endangered species attracts the attention of ornithologists because of its limited distribution within the state. It nests in Kentucky but is rarely found anywhere except around the main bridges and dams at Kentucky Lake and Lake Barkley. In those areas it is abundant.

In the Land-Between-the-Lakes National Recreation Area, which together with the two lakes, covers about a third of the total area of the two counties, is another bird that is of considerable historic interest to wildlife management people. This is the wild turkey. The turkey population is directly descended from the only surviving remnant of the original stock that existed in Kentucky in presettlement times.

The fallow deer, a native of Turkey, was introduced to the Land-Between-the-Lakes area several years ago. The herd has prospered and now provides a substantial amount of sport hunting.

The Indiana bat and gray bat inhabit Lyon and Trigg Counties also. These mammals are on the federal list of endangered species.

The wildlife attract sightseers, photographers, hunters, and trappers. Hunters seek the cottontail rabbit, swamp rabbit, gray squirrel, fox squirrel, raccoon, red fox, skunk, opossum, fallow deer, white-tailed deer, mourning dove, bobwhite quail, and wild turkey. Trapping effort is concentrated upon the raccoon, red fox, gray fox, mink, and muskrat. Bird watchers and photographers are especially interested in the rare and unusual species that frequent the area.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 9, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat (*1*).

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

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

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, and grama.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, the available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Coniferous plants furnish browse, seeds, and cones. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are

created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, deer, and bear.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, shore birds, muskrat, mink, and beaver.

engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey can be used to make additional interpretations.

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

building site development

Table 10 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer;

stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

sanitary facilities

Table 11 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 11 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to effectively filter the effluent. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 11 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of

organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 11 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

construction materials

Table 12 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 12, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to

12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

water management

Table 13 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water

capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

soil properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics. These results are reported in table 17.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

engineering index properties

Table 14 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil series and their morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If a soil contains particles coarser than sand, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (*3*) and the system adopted by the American Association of State Highway and Transportation Officials (*2*).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as Pt. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 17.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

physical and chemical properties

Table 15 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

soil and water features

Table 16 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and

soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt and water in swamps and marshes are not considered flooding.

Table 16 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, common, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *common* that it is likely under normal conditions; *occasional* that it occurs on an average of once or less in 2 years; and *frequent* that it occurs on an average of more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; November-May, for example, means that flooding can occur during the period November through May.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. Only saturated zones within a depth of about 6 feet are indicated. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 16 are the depth to the seasonal high water table; the kind of water table—that is, perched, artesian, or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 16.

An apparent water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. An artesian water table is under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole. A perched water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

engineering index test data

Table 17 shows laboratory test data for several pedons sampled at carefully selected sites in the survey area. The pedons are typical of the series and are described in the section "Soil series and their morphology." The soil samples were tested by Division of Research, Bureau of Highways, Department of Transportation, Commonwealth of Kentucky.

The testing methods generally are those of the American Association of State Highway and Transportation Officials (AASHTO) or the American Society for Testing and Materials (ASTM).

The tests and methods are: AASHTO classification—M 145 (AASHTO), D 3282 (ASTM); Unified classification—D 2487 (ASTM); Mechanical analysis—T 88 (AASHTO), D 2217 (ASTM); Liquid limit—T 89 (AASHTO), D 423 (ASTM); Plasticity index—T 90 (AASHTO), D 424 (ASTM); Moisture density, Method A—T 99 (AASHTO), D 698 (ASTM).

classification of the soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*20*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. In table 18, the soils of the survey area are classified according to the system. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Entisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquent (*Aqu*, meaning water, plus *ent*, from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haplaquents (*Hapl*, meaning minimal horizonation, plus *aquent*, the suborder of the Entisols that have an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Fluvaquents.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-silty, mixed, nonacid, mesic Typic Fluvaquents.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

soil series and their morphology

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

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the Soil Survey Manual (*18*). Many of the technical terms used in the descriptions are defined in Soil Taxonomy (*20*). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed soil map units."

Baxter series

The Baxter series consists of deep, well drained, moderately permeable cherty soils on uplands. These soils formed in material weathered from cherty limestone. The slope range is 6 to 60 percent.

The Baxter soils are on the same landscape as Hammack, Brandon, and Saffell soils. The Hammack and Brandon soils have a surface layer and upper subsoil that formed in loess and do not have coarse fragments. They are fine-silty. In the Baxter soils the coarse fragments are angular chert, but in the Saffell soils they are rounded pebbles. The Saffell soils are loamy-skeletal.

Typical pedon of Baxter cherty silt loam in an area of Hammack-Baxter complex, 6 to 12 percent slopes, in a pasture, 100 feet southeast of farm lane, 1 1/4 miles northeast of Kentucky Highway 525, and 1 1/2 miles southwest of the junction of Kentucky Highways 139 and 525; or about 5 1/2 miles southeast of Cadiz:

Ap—0 to 10 inches; brown (10YR 5/3) cherty silt loam; weak fine granular structure; very friable; many fine roots; 25 percent chert fragments; neutral; abrupt smooth boundary.

B1—10 to 18 inches; red (2.5YR 4/6) silty clay loam; moderate medium angular blocky structure parting to fine and very fine angular blocky; firm; common pale brown (10YR 6/3) silt coatings; 5 percent chert fragments; strongly acid; gradual wavy boundary.

B21t—18 to 28 inches; red (10R 4/6) cherty silty clay; few fine faint strong brown (7.5YR 5/6) mottles; moderate medium angular blocky structure parting to fine and very fine angular blocky; firm; few fine roots; many clay films; 30 percent fragments chert; strongly acid; gradual wavy boundary.

B22t—28 to 35 inches; red (2.5YR 4/6) cherty silty clay; few medium distinct strong brown (7.5YR 5/6) mottles; firm; occasional fine roots; many clay films; 20 percent chert fragments, half more than 3 inches in diameter; few small loamy pockets or chert ghosts; strongly acid; clear wavy boundary.

B23t—35 to 48 inches; dark red (10R 3/6) cherty clay; common fine distinct strong brown (7.5YR 5/6) and light brownish gray (10YR 6/2) mottles or shale-like material; moderate coarse and medium angular blocky structure parting to fine and very fine angular blocky; firm; many clay films; 30 percent chert fragments, half more than 3 inches in diameter; strongly acid; gradual smooth boundary.

B24t—48 to 80 inches; dark red (10R 3/6) very cherty clay; common fine distinct light brownish gray (10YR 6/2) mottles or shale-like material; moderate coarse and medium angular blocky structure parting to fine and very fine angular blocky; firm; many clay films; 40 percent chert fragments, half more than 3 inches in diameter; strongly acid; clear wavy boundary.

B25t—80 to 95 inches; dark red (10R 3/6) very cherty clay; common medium distinct strong brown (7.5YR 5/6) and light brownish gray (10YR 6/2) mottles; moderate medium and coarse angular blocky structure parting to weak fine and very fine angular blocky; firm; many clay films; common black coatings on larger peds; 45 percent chert fragments, half more than 3 inches in diameter; strongly acid.

The solum is 60 to more than 120 inches thick. Bedrock is at a depth of 5 to 30 feet or more. Reaction is strongly acid to very strongly acid in all horizons except in areas where the A horizon has been limed.

The A horizon has hue of 10YR to 7.5YR, value from 4 to 5, and chroma of 2 to 4. The texture is silt loam or cherty silt loam. The content of chert fragments ranges from 5 to 35 percent.

The B1 horizon has hue of 7.5YR, 5YR, or 2.5YR, value of 4 or 5, and chroma of 4 to 6. The texture is cherty silt loam, cherty silty clay loam, or silty clay loam. The content of chert fragments commonly ranges from 5 to 30 percent.

The B2t horizon has hue of 5YR, 2.5YR, or 10R, value of 3 through 6, and chroma of 4 to 8. The texture is cherty silty clay, cherty clay, or very cherty clay. The content of chert fragments ranges from 15 to 45 percent, but the weighted average does not exceed 35 percent. In some pedons the B2t horizon is mottled in shades of brown and gray in the lower part.

Brandon series

The Brandon series consists of deep, well drained soils on uplands. These soils formed in loess and gravelly Coastal Plain material. Permeability is moderate in the B horizon and moderately rapid or rapid in the C horizon. The slope range is 6 to 50 percent.

The Brandon soils are on the same landscape as Baxter, Hammack, Lax, and Saffell soils. The Baxter soils formed in residuum of cherty limestone, and they are fine. The Hammack soils formed in loess and in residuum of cherty limestone, and they are fine-silty. The Lax soils have a fragipan. The Saffell soils formed in gravelly Coastal Plain material, and they are loamy-skeletal.

Typical pedon of Brandon silt loam in an area of Brandon-Saffell complex, 20 to 50 percent slopes, about 2.2 miles north of the Tennessee State line and 1.6 miles east of Joiner Chapel on Kentucky Highway 139 in the western part of Fort Campbell in Trigg County:

A1—0 to 1 inch; brown (10YR 5/3) silt loam; weak fine granular structure; very friable; many small roots; few small pebbles; strongly acid; abrupt smooth boundary.

A2—1 inch to 8 inches; yellowish brown (10YR 5/4) silt loam; weak medium angular blocky structure parting to weak fine granular; very friable; common small roots; few small pebbles; very strongly acid; clear smooth boundary.

B1—8 to 12 inches; strong brown (7.5YR 5/6) silt loam; weak medium subangular blocky structure; very friable; common medium roots; few small pebbles; very strongly acid; clear smooth boundary.

B21t—12 to 28 inches; yellowish red (5YR 4/6) silty clay loam; brown (7.5YR 4/4) crushed; moderate medium subangular and angular blocky structure; friable; few small roots; few small pebbles; many clay films with slightly redder color on ped surfaces and in pores; very strongly acid; abrupt smooth boundary.

IIB22t—28 to 34 inches; strong brown (7.5YR 5/6) gravelly silty clay loam; many fine and medium distinct light gray (10YR 7/2) mottles; moderate

medium angular blocky structure; firm; few small roots; 40 percent gravel; 20 percent light gray silty coatings; many clay films on peds and pebbles; very strongly acid; clear smooth boundary.

IIB23t—34 to 41 inches; brown (7.5YR 4/4) very gravelly loam; few fine distinct light gray (10YR 7/2) mottles and silt coatings; weak medium angular blocky structure; firm; common clay films; 60 percent gravel; few small roots; strongly acid; clear smooth boundary.

IIB24t—41 to 60 inches; yellowish red (5YR 4/6) gravelly clay loam; common medium faint brown (7.5YR 5/4) and common medium prominent light gray (10YR 7/2) mottles; moderate medium angular blocky structure; very firm; common clay films; 50 percent gravel; very strongly acid; gradual wavy boundary.

IIB3t—60 to 72 inches; yellowish red (5YR 4/6) very gravelly sandy clay loam; many medium faint strong brown (7.5YR 5/6) mottles; weak moderate subangular blocky structure; very firm; few clay films on pebbles and on peds; 50 percent gravel; very strongly acid.

The solum is 20 to 80 inches thick. The loess is 20 to 40 inches thick. Reaction ranges from strongly acid to very strongly acid except in areas where the surface horizon has been limed.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 1 to 4. It is silt loam except in severely eroded plowed areas, where the Ap horizon is mostly B horizon material.

The B horizon has hue of 7.5YR or 5YR, value of 4 to 6, and chroma of 4 to 6. The texture is silty clay loam or silt loam. In some pedons, mottles in shades of gray are below a depth of 30 inches.

The IIB horizon has hue of 7.5YR through 2.5YR, value of 4 to 7, and chroma of 4 to 6. The content of pebbles ranges from 30 to 70 percent. The fine earth texture is loam, silt loam, clay loam, sandy clay loam, or fine sandy loam.

Some pedons have a IIC horizon that has the same color and texture as the IIB horizon.

Clifty series

The Clifty series consists of deep, well drained, cherty or gravelly soils. These soils are on bottom lands in narrow strips along the upper reaches of small branch bottoms and along the channel of larger streams. They formed in alluvium derived from loess, limestone, and gravelly Coastal Plain sediments. Permeability is moderately rapid. The slope range is 0 to 2 percent.

The Clifty soils are in close geographic association with Nolin and Lindside soils, which are on the first bottoms, and with Baxter, Hammack, Brandon, and Saffell soils, which are on the adjoining uplands. The Clifty soils have more coarse fragments and are more acid than the Nolin and Lindside soils, and they are fine-loamy. They are also better drained than the Lindside soils. The soils on uplands have an argillic horizon. The Brandon and Hammack soils do not have coarse fragments in the surface layer and in the upper subsoil.

Typical pedon of Clifty gravelly silt loam, in a pasture, about 2.2 miles north of the Tennessee State line and 1.5 miles east of Joiner Chapel in the western part of Fort Campbell, in Trigg County:

Ap—0 to 6 inches; brown (7.5YR 4/4) gravelly silt loam; moderate fine granular structure; very friable; common small roots; 15 percent gravel; strongly acid; clear wavy boundary.

B21—6 to 22 inches; brown (7.5YR 4/4) gravelly silt loam; weak medium subangular blocky structure parting to moderate fine angular; very friable; common small roots; 20 percent gravel that is 1 percent pebbles larger than 3 inches; strongly acid; clear wavy boundary.

B22—22 to 34 inches; brown (7.5YR 4/4) gravelly silt loam; weak medium subangular blocky structure parting to weak fine granular; very friable; few small roots; 30 percent gravel that is 1 percent pebbles larger than 3 inches; strongly acid; clear wavy boundary.

C1—34 to 50 inches; brown (7.5YR 4/4) very gravelly loam; weak fine granular structure; very friable; 60 percent gravel that is about 10 percent pebbles larger than 3 inches; strongly acid; abrupt wavy boundary.

C2g—50 to 60 inches; light gray (10YR 7/1) gravelly clay loam; common medium distinct brownish yellow (10YR 6/6) mottles; structureless; friable; 40 percent gravel that is about 10 percent pebbles larger than 3 inches; strongly acid.

The solum is 25 to more than 60 inches thick. Bedrock is at a depth of 5 to more than 15 feet. Reaction ranges from very strongly acid to medium acid throughout. The content of chert, gravel, or cobblestones, by volume, ranges from 15 to 35 percent except in the C horizon, where the range is up to 60 percent.

The A horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. The texture of the fine earth part is silt loam or loam.

The B horizon has hue of 10YR to 7.5YR, value of 4 or 5, and chroma of 3 through 6. A few mottles that have chroma of 2 or less may occur at depths below 24 inches. The texture of the fine earth part is silt loam or loam.

The C horizon has the same color as the B horizon. The C2 horizon has value of 4 to 7 and chroma of 1 to 6. It is dominantly gray or mottled in shades of gray, brown, or yellow. The texture of the fine earth part is silt loam, loam, or clay loam.

Crider series

The Crider series consists of deep, well drained, moderately permeable soils that formed in loess and the underlying residuum of limestone. These soils are on ridgetops and side slopes, and in karst areas. The slope range is 0 to 12 percent.

The Crider soils are geographically associated with Pembroke and Fredonia soils, which are on uplands, and with Nolin, Lindside, and Newark soils which are in colluvial basins and on first bottoms. They are next to Elk and Otwell soils, which are on stream terraces, and next to Hammack soils, which are in some upland areas. The Crider soils have a subsoil that is not so red as that of the Pembroke soils, and they do not have the mollic epipedon of the Pembroke soils. Fredonia soils are shallower to bedrock and have more clay in the upper part of the profile than the Crider soils. The Crider soils have more clay than the Nolin soils, and they are better drained and have more clay in the subsoil than the Lindside and Newark soils. The Crider, Elk, and Hammack soils have similar material in the upper 2 feet of the profile. The Elk soils formed in alluvium, and they are loamy in the lower part of the profile. The Hammack soils have firm cherty silty clay in the lower part of the profile. The Otwell soils are moderately well drained and have a fragipan.

Typical pedon of Crider silt loam, 2 to 6 percent slopes, in a rotation pasture, 7,000 feet west of the Christian County line, 900 feet north of Thomas Road, and 800 feet east of Bacon Cemetery; or about 6 miles east of Cadiz:

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; moderate fine granular structure; very friable; many roots; slightly acid; abrupt smooth boundary.

B21t—8 to 24 inches; brown (7.5YR 4/4) silty clay loam; moderate medium subangular blocky structure; friable; common to many roots; clay films on ped surfaces and in pores; very dark grayish brown (10YR 3/2) organic stains and few black concretions; medium acid; gradual wavy boundary.

B22t—24 to 40 inches; yellowish red (5YR 4/6) silty clay loam; moderate medium subangular blocky structure; friable; common roots; clay films on peds and in pores; black concretionary stains on some peds; few black concretions; strongly acid; gradual wavy boundary.

IIB23t—40 to 54 inches; red (2.5YR 4/6) silty clay loam; moderate medium subangular blocky structure; friable; few fine discontinuous pale brown (10YR 6/3) silt coatings on some peds; common clay films on peds and in pores; common concretions; strongly acid; gradual wavy boundary.

IIB24t—54 to 66 inches; dark red (10R 3/6) silty clay; few fine distinct pinkish gray (5YR 7/2) and pale red (2.5YR 6/2) mottles; moderate fine angular blocky structure; firm; strongly acid.

The solum is more than 60 inches thick. The loess is 20 to 45 inches thick. Limestone is at a depth of more than 72 inches. The content of chert fragments ranges from 0 to 5 percent in the IIB2t horizon. Reaction is strongly acid or medium acid in unlimed areas.

The Ap horizon has hue of 7.5YR or 10YR, value of 4, and chroma of 2 through 4. It is 5 to 10 inches thick.

The B1 horizon, if present, has hue of 10YR or 7.5YR and value and chroma of 4. It is 0 to 6 inches thick.

The B21t horizon has hue of 10YR to 7.5YR, value of 4 or 5, and chroma of 4 to 6. The B22t horizon has hue of 7.5YR to 5YR, value of 4 or 5, and chroma of 4 to 8. The texture is silt loam or silty clay loam.

The IIB2t horizon has hue of 5YR to 10R, value of 3 to 5, and chroma of 4 to 6. In some pedons the IIB2t horizon is mottled in shades of gray in the lower part. It is silty clay loam, silty clay, or clay.

Elk series

The Elk series consists of deep, well drained, moderately permeable soils on stream terraces. These soils formed in mixed loamy alluvial material. The slope range is 0 to 6 percent.

The Elk soils are in close geographic association with the Otwell, Nolin, Lindside, and Newark soils. The Otwell soils are also on stream terraces but are moderately well drained and have a fragipan. The Nolin, Lindside, and Newark soils are on first bottoms. The Elk soils have more clay, have better developed horizons, and are more acid than the Nolin soils. The Elk soils are also better drained than the Lindside and Newark soils.

Typical pedon of Elk silt loam, 0 to 2 percent slopes, in a cultivated field, 240 feet north of Illinois Central Railroad 3,400 feet southeast of the Caldwell County line; or about 9 miles northeast of Cadiz:

Ap—0 to 10 inches (10YR 4/3) silt loam; moderate fine granular structure; very friable; many fine roots; common very fine discontinuous pores; slightly acid; clear wavy boundary.

B1—10 to 16 inches; brown (7.5YR 4/4) silt loam; weak medium subangular blocky and weak fine granular structure; friable; many fine roots; common very fine discontinuous pores; slightly acid; gradual wavy boundary.

B21t—16 to 32 inches; brown (7.5YR 4/4) silty clay loam; moderate medium subangular blocky structure; friable; common fine roots; common fine continuous pores; thin patchy clay films; strongly acid; clear wavy boundary.

B22t—32 to 44 inches; strong brown (7.5YR 5/6) silty clay loam; few medium faint pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; few fine roots; common fine continuous pores; thin patchy clay films on peds and in pores; few small black concretions and stains; strongly acid; clear wavy boundary.

C—44 to 60 inches; strong brown (7.5YR 5/6) clay loam; common medium faint pale brown (10YR 6/3) mottles; massive; friable; few fine roots; common fine pores; few small black concretions and stains; strongly acid.

The solum is 36 to 54 inches thick. Bedrock is at a depth of 5 to more than 20 feet. Reaction ranges from slightly acid to strongly acid in all horizons in unlimed areas.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. The texture is silt loam.

The B1 horizon is up to 10 inches thick. It has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. The texture is silt loam.

The B2 horizon has the same range of colors as the B1 horizon. The texture ranges from silt loam to silty clay loam. Some pedons have mottles in shades of gray and are 1 to 5 percent pebbles in the lower part.

The C horizon has the same color range as the B horizon. It is silt loam, clay loam, silty clay loam, or fine sandy loam and 0 to 35 percent gravel.

Fredonia series

The Fredonia series consists of moderately deep, well drained, moderately slowly permeable to slowly permeable, clayey soils on uplands. These soils formed in material weathered from limestone. The slope range is 2 to 20 percent, but most of the acreage is on slopes of 6 to 12 percent.

The Fredonia soils are on the same landscape as Pembroke, Hagerstown, and Crider soils. The Pembroke and Crider soils have bedrock at a depth of more than 60 inches, and the Hagerstown soils are 40 inches or more deep to bedrock.

Typical pedon of Fredonia silt loam in an area of Fredonia-Pembroke silt loams, rocky, 2 to 12 percent slopes, in a pasture, 3 1/2 miles northeast of Cadiz; 150 feet southeast of Kentucky Highway 124 and 150 feet north of I-24 right-of-way:

A11—0 to 1 inch; brown (7.5YR 4/2) silt loam; moderate fine granular structure; very friable; many fine roots; medium acid; abrupt smooth boundary.

A12—1 inch to 9 inches; reddish brown (5YR 4/3) silt loam; moderate fine granular structure; very friable; many fine roots; medium acid; gradual wavy boundary.

B21t—9 to 15 inches; red (2.5YR 4/6) silty clay loam; moderate medium subangular blocky structure; friable; thin discontinuous clay films on ped surfaces and in pores; few fine roots; strongly acid; clear wavy boundary.

B22t—15 to 28 inches; dark red (10R 3/6) silty clay; moderate medium subangular blocky structure; very firm; clay films on peds and in pores; black stains on some peds and few fine black concretions and chert fragments; few fine roots; medium acid; clear wavy boundary.

B3—28 to 30 inches; dusky red (10R 3/4) silty clay; weak fine subangular blocky structure; very firm; few clay films and black stains; few black concretions; neutral; abrupt broken boundary.

R—30 inches; light gray limestone.

Solum thickness and depth to bedrock range from 20 to 40 inches. A few limestone outcrops and boulders are on the surface. Reaction ranges from strongly acid to medium acid in the upper part and from medium acid to mildly alkaline in the lower part of the B horizon in unlimed areas.

The A1 or Ap horizon has hue of 10YR, 7.5YR, and 5YR, value of 3 or 4, and chroma of 2 to 4. The texture is silt loam. In eroded areas, it is silty clay loam.

The B2t horizon has hue of 5YR, 2.5YR, and 10R, value of 3 or 4, and chroma of 4 through 6. This horizon commonly is silty clay or clay throughout. In some pedons, a few inches of silty clay loam is in the upper part.

The B3 horizon is 2 to 6 inches thick and has the same color and texture as the B2 horizon. In some pedons it is mottled in shades of brown or yellow. Reaction ranges from slightly acid to mildly alkaline.

Some pedons have a C horizon that has the same range in characteristics as the B3 horizon.

Frondorf series

The Frondorf series consists of moderately deep, well drained, moderately permeable soils on uplands. These soils formed in loess and residuum of sandstone, siltstone, and shale. The slope range is 6 to 50 percent.

The Frondorf soils are on the same landscape as the Fredonia, Hagerstown, Weikert, and Wellston soils. The Fredonia and Hagerstown soils formed in residuum of limestone. They have a subsoil that is redder and more clayey than that of the Frondorf soils. The Hagerstown soils are more than 40 inches deep to bedrock. The Frondorf soils are on slightly higher positions on the landscape than the Fredonia and Hagerstown soils. The Frondorf soils are mapped in a complex with the Weikert and Wellston soils. These soils formed partly in residuum of sandstone, siltstone, and shale. Bedrock is at a depth of less than 20 inches in the Weikert soils, at a depth of 20 to 40 inches in the Frondorf soils, and at a depth of more than 40 inches in the Wellston soils. The Wellston soils have a thicker loess mantle than the Frondorf soils. The Weikert soils have no loess mantle or a very thin one.

Typical pedon of Frondorf silt loam in an area of Frondorf-Weikert-Wellston complex, 12 to 20 percent slopes, in a pasture, 1.3 miles south-southeast of northeast corner of Trigg County; 1,800 feet east of the Christian County line and 2 1/4 miles southeast of Cerulean Springs, or about 10 miles northeast of Cadiz:

A1—0 to 1 inch; very dark gray (10YR 3/2) silt loam; moderate fine granular structure; very friable; many fine roots; very strongly acid; abrupt smooth boundary.
A2—1 inch to 5 inches; light yellowish brown (10YR 6/4) silt loam; weak fine granular structure; very friable; common fine roots; very strongly acid; abrupt smooth boundary.
B1—5 to 9 inches; strong brown (7.5YR 5/8) silt loam; common medium faint brown (10YR 5/3) mottles; weak fine subangular blocky structure; friable; common fine roots; common fine pores; very strongly acid; clear wavy boundary.
B21t—9 to 21 inches; strong brown (7.5YR 5/6) silty clay loam; weak medium subangular blocky structure; friable; few fine roots; common fine pores; few thin flat fragments; common thin clay films; strongly acid; clear wavy boundary.
IIB22t—21 to 29 inches; brown (7.5YR 5/4) channery loam; weak medium subangular blocky structure; friable; few fine roots; common fine pores; few clay films; 25 percent sandstone fragments 1 to 8 inches across; strongly acid; clear wavy boundary.
IIR—29 inches; yellowish brown coarse grained sandstone.

The thickness of the solum and the depth to sandstone, siltstone, or shale bedrock range from 20 to 40 inches. Reaction ranges from very strongly to strongly acid in unlimed areas. The content of coarse fragments ranges from 0 to 5 percent to a depth of 12 to 24 inches and from 15 to 75 percent below that depth.

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

The A2 horizon is 3 to 7 inches thick. It has hue of 10YR, value of 4 to 6, and chroma of 2 through 4.

The B horizon has hue of 10YR or 7.5YR, value of 4 through 6, and chroma of 4 through 8. In some pedons the B1 horizon is up to 6 inches thick. The B2 horizon is silt loam or silty clay loam.

The IIB2 horizon and, in some pedons, a C horizon have the same range in color as the B2 horizon, but they are 15 to 75 percent coarse fragments of sandstone, siltstone, and shale. The fine earth part is silt loam, loam, clay loam, sandy loam, silty clay loam, or sandy clay loam.

Hagerstown series

The Hagerstown series consists of deep, well drained, moderately permeable soils on uplands. These soils formed in residuum of limestone and some mixture from sandstone and shale. The slope range is 6 to 20 percent.

The Hagerstown soils are on the same landscape as the Fredonia, Frondorf, Weikert, and Wellston soils. The Fredonia soils are moderately deep over bedrock. The Frondorf, Weikert, and Wellston soils are in slightly higher positions on the landscape. These soils formed in residuum of sandstone, shale, and limestone.

Typical pedon of Hagerstown silt loam in an area of Hagerstown-Fredonia silt loams, very rocky, 12 to 20 percent slopes, in a forested area 2 1/2 miles southeast of Wallonia and 200 feet southeast of Rocky Ridge Church in Trigg County:

Ap1—0 to 2 inches; brown (10YR 5/3) silt loam; weak fine granular structure; very friable; common fine roots; strongly acid; abrupt smooth boundary.
Ap2—2 to 8 inches; brown (7.5YR 5/4) silt loam; weak fine granular structure; very friable; few fine roots; strongly acid; clear wavy boundary.
B21t—8 to 13 inches; red (1.5YR 5/6) silty clay loam; weak fine and medium subangular blocky structure; friable; few fine roots; few fine pores; continuous clay films; strongly acid; clear wavy boundary.
B22t—13 to 31 inches; red (2.5YR 4/6) silty clay; moderate medium and fine subangular blocky structure; firm; continuous clay films; few small black concretions; strongly acid; clear wavy boundary.
B23t—31 to 44 inches; reddish brown (2.5YR 4/4) silty clay; moderate medium and fine angular blocky structure; firm; few fine roots; continuous clay films; light gray and light yellowish brown silty material coats vertical faces and cracks; small black concretions are common; strongly acid; gradual wavy boundary.
C—44 to 48 inches; weak red (2.5YR 4/2) and brown (7.5YR 4/2) clay; very firm; thick clay films on pressure faces; neutral; abrupt smooth boundary.
R—48 inches; limestone.

The solum is 40 to 50 inches thick. Bedrock is at a depth of 40 to 60 inches or more. Reaction is strongly acid or very strongly acid in the upper part of the profile except where the surface has been limed. The C horizon is slightly acid to neutral.

The A horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 through 4. The texture is silt loam, loam, or silty clay loam.

The B2t horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 4 through 8. The texture is silty clay or clay.

The C horizon has hue of 10YR through 2.5YR, value of 3 through 6, and chroma of 4 through 8. It is uniform to highly variegated in color. The texture ranges from silty clay loam to clay.

Hammack series

The Hammack series consists of deep, well drained, moderately permeable soils on uplands. These soils formed in loess over cherty residuum of limestone. They are on ridgetops and side slopes in karst areas and in rolling to hilly areas that have a dendritic drainage pattern. The slope range is 2 to 60 percent.

The Hammack soils are on the same landscape as Baxter, Nicholson, Crider, Pembroke, Nolin, Lindside, and Newark soils. The Baxter soils are more than 35 percent clay and 15 to 35 percent chert fragments in the upper 20 inches of the argillic horizon. The Nicholson soils have a fragipan. The Crider and Pembroke soils are less than 15 percent chert fragments throughout the solum and are commonly in a slightly lower position on the landscape than the Hammack soils. The Nolin, Lindside, and Newark soils formed in alluvium in depressions and basins, and on first bottoms. They have less clay in the solum than the Hammack soils. The Lindside and Newark soils are not as well drained as the Hammack soils.

Typical pedon of Hammack silt loam, 2 to 6 percent slopes, in a pasture, 3 miles northwest of the junction of Kentucky Highways 287 and 164 at Pee Dee and 1 mile east of the gauging station at the confluence of Casey Creek and Little River; or about 11 1/2 miles southeast of Cadiz, in Trigg County:

Ap—0 to 6 inches; brown (7.5YR 4/4) silt loam; weak fine granular structure; very friable; many fine roots; mildly alkaline; abrupt smooth boundary.

B21t—6 to 25 inches; strong brown (7.5YR 5/6) silty clay loam; moderate medium angular blocky structure parting to fine and very angular blocky; friable; common fine roots; common clay films; few black stains on peds; lower 2 inches has common mottles in shades of gray and brown; strongly acid; abrupt smooth boundary.

IIB&A2—25 to 30 inches; mottled reddish brown (5YR 4/4) and brown (7.5YR 5/4) very cherty silt loam (B2t); A2 part makes up about 10 percent and consists of discontinuous brownish gray silt coatings; weak medium angular blocky structure; friable; few fine roots; 55 percent chert fragments; common clay films; strongly acid; abrupt smooth boundary.

IIB22t—30 to 51 inches; dark red (2.5YR 3/6) clay; common medium distinct strong brown (7.5YR 5/6) mottles; moderate medium angular blocky structure parting to very fine angular blocky; very firm; few fine roots; many dark red (2.5YR 3/6) and weak red (2.5YR 4/2) clay films; few chert fragments; strongly acid; clear smooth boundary.

IIB23t—51 to 58 inches; dark red (2.5YR 3/6) cherty clay; common medium distinct strong brown (7.5YR 5/6) mottles; moderate medium angular blocky structure parting to fine and very fine angular blocky; firm; occasional small root; 20 percent chert fragments; many clay films; very strongly acid; clear smooth boundary.

IIB24t—58 to 69 inches; dark reddish brown (2.5YR 3/4) very cherty clay; few fine distinct strong brown (7.5YR 5/6) and pinkish gray (7.5YR 6/2) mottles; moderate medium angular blocky structure parting to fine and very fine angular blocky; very firm; many clay films; 55 percent chert fragments; strongly acid; gradual smooth boundary.

IIB25t—69 to 94 inches; dark red (2.5YR 3/6) cherty clay; common medium distinct light brownish gray (10YR 6/2) and pale brown (10YR 6/3) mottles; moderate medium angular blocky structure parting to fine and very fine angular blocky; very firm; many clay films; strongly acid; 40 percent chert fragments.

The solum is 72 inches or more thick. Reaction ranges from very strongly acid to medium acid except in limed areas, where the Ap horizon and upper part of the B horizon range to neutral. The upper part of the solum which formed in loess, is about 20 to 40 inches thick. The content of chert fragments ranges from 0 to 5 percent in the loess horizons, from 35 to 80 percent in the IIB&A2 horizon, and from 0 to 80 percent in the individual IIB2t horizons. By weighted average, the content of chert in the IIB2t horizon is 15 to 35 percent.

The A horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. Texture is silt loam or, in severely eroded areas, silty clay loam.

In some pedons the B1 horizon is 3 to 5 inches thick and has color and texture like the A horizon.

The B2t horizon has hue of 7.5YR or 5YR, value of 4 or 5, and chroma of 4 to 6. Some pedons have pale brown or brownish gray mottles in the lower 2 to 4 inches. The texture is silty clay loam or silt loam.

The IIB&A2 horizon has hue of 10YR, 7.5YR, or 5YR, value of 4 or 5, and chroma of 4 to 6. Most pedons are mottled in shades of brown and gray. The fine earth fraction is silt loam or silty clay loam. The A2 part makes up 5 to 15 percent of the horizon and it consists of silt coatings that have hue of 10YR or 7.5YR, value of 6 or 7, and chroma of 1 through 4.

The IIB2t horizon has hue of 2.5YR or 5YR, value of 3 through 5, and chroma of 4 or 6 and few or common mottles are in shades of brown, gray, yellow, or red. The fine earth fraction is clay or silty clay.

In this survey area, the Hammack soils typically are a taxadjunct because the saturation is slightly less than that defined in the range for the official Hammack series; however some of the Hammack soils have the base saturation defined for the Hammack series.

Lawrence series

The Lawrence series consists of deep, somewhat poorly drained, slowly permeable soils that have a fragipan. These soils are on uplands and terraces. They formed in loess and underlying alluvial or colluvial material or in residuum of limestone, sandstone, and shale. The slope range is 0 to 2 percent.

The Lawrence soils are on the same landscape as Nicholson and Sadler soils, which are on uplands; as Otwell and Elk soils, which are on terraces; and as the Robertsville soils, which are on uplands and terraces. The Lawrence soils have gray mottles in the upper 10

inches of the subsoil and are not as well drained as the Nicholson, Sadler, Elk, and Otwell soils. The Robertsville soils are more poorly drained than the Lawrence soils.

Typical pedon of Lawrence silt loam, in a cultivated field in the northeast corner of Trigg County; 150 feet south and 3,200 feet west of the Christian County line; 2 miles northeast of Cerulean or about 11 miles northeast of Cadiz:

Ap—0 to 8 inches; brown (10YR 5/3) silt loam; weak fine granular structure; very friable; common fescue roots; slightly acid; abrupt smooth boundary.

B21t—8 to 20 inches; yellowish brown (10YR 5/6) silt loam; common medium distinct light brownish gray mottles (10YR 6/2) weak medium and fine subangular blocky structure; friable; few clay films on peds and in pores; few small concretions; strongly acid; clear wavy boundary.

B22t—20 to 23 inches; pale brown (10YR 6/3) silt loam; weak fine subangular blocky structure; friable; thin patchy clay films; light gray and light brownish gray silt coats on most ped faces; strongly acid; gradual wavy boundary.

Bx—23 to 43 inches; gray (10YR 5/1) silty clay loam; common medium prominent yellowish brown mottles (10YR 5/6); weak very coarse prismatic structure parting to weak medium subangular and angular blocky; very firm and brittle; few roots along prism faces; gray clay coats on prism faces; strongly acid; gradual wavy boundary.

B3—43 to 60 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct light gray (10YR 7/2) mottles; weak fine angular blocky structure; friable; few small concretions; some black stains; slightly acid.

The solum is 40 to 80 inches thick. Bedrock is at a depth of 60 to more than 200 inches. Reaction through the fragipan is strongly acid or very strongly acid, except where the surface is limed. The B3 horizon and the C horizon, which is in some pedons, range from very strongly acid through neutral.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 through 4.

The B2 horizon has matrix in hue of 10YR through 2.5Y, value of 5 or 6, and chroma of 3 through 6. Mottles that have chroma of 2 or less range from few to many and in some pedons mottles are in shades of brown. Some pedons have a thin B1 horizon or a B2 horizon less than 10 inches thick that has no gray mottles. The texture of the B2 horizon is silt loam or silty clay loam.

The Bx horizon has matrix and mottle colors ranging from light gray (10YR 7/1) through reddish yellow (7.5YR 6/8), and in many pedons it is equally mottled in shades of gray and brown. The texture is silty clay loam or silt loam.

Matrix and mottle colors of the B3 horizon, and the C horizon if present, range from light gray (10YR 7/1) through yellowish red (5YR 4/6). The texture ranges from silt loam through clay.

Lax series

The Lax series consists of deep, moderately well drained soils that have a fragipan. These soils are on ridgetops and on the upper part of side slopes. They are moderately permeable above the fragipan and slowly permeable in the fragipan. They formed in loess over gravelly Coastal Plain material. The elevation is commonly more than 550 feet. The slope range is 2 to 12 percent.

The Lax soils are on the same landscape as Brandon, Saffell, and Nicholson soils. The Brandon and Saffell soils are better drained than the Lax soils and do not have a fragipan. The Nicholson soils have a fragipan but differ from the Lax soils in having a IIB2 horizon that formed in residuum of cherty limestone. The Nicholson soils are on lower-lying ridgetops and side slopes than the Lax soils.

Typical pedon of Lax silt loam, 2 to 6 percent slopes, in an idle field about 4.2 miles north of the Tennessee State line and one-third mile east of Kentucky Highway 139, in the western part of Fort Campbell, in Trigg County:

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

B2t—7 to 24 inches; yellowish brown (10YR 5/6) silty clay loam; weak medium subangular blocky structure; friable; few small roots; many clay films that are strong brown (7.5YR 5/6); common fine distinct pale brown (10YR 6/3) mottles in the lower 3 inches; very strongly acid; gradual wavy boundary.

Bx1—24 to 39 inches; yellowish brown (10YR 5/4) silt loam; many medium faint brown (10YR 5/3) and light brownish gray (10YR 6/2) mottles and silt coatings; moderate very coarse prismatic structure parting to weak medium platy in the upper one-third and parting to weak medium subangular blocky in the lower two-thirds; gray (10YR 6/1) silty clay loam, 1 to 2 centimeters thick and very firm and brittle, is between prisms; very strongly acid; clear wavy boundary.

IIBx2—39 to 49 inches; yellowish brown (10YR 5/4) gravelly silt loam; common medium distinct light gray (10YR 7/1) mottles and silt coatings inside prisms; moderate very coarse prismatic structure parting to weak medium subangular blocky; very firm and brittle; silty clay loam between prisms as described for the Bx1 horizon; 25 percent gravel up to 2 inches in diameter; very strongly acid; clear wavy boundary.

IIB3—49 to 72 inches; yellowish red (5YR 4/6) gravelly clay; common medium faint strong brown (7.5YR 5/6) and common medium distinct reddish gray

(5YR 5/2) mottles; moderate medium angular blocky structure; firm; many clay films of dark reddish gray (5YR 4/2) or dark reddish brown (5YR 3/4); 15 percent gravel; very strongly acid.

The solum is about 46 to 72 inches thick. The fragipan is at a depth of 18 to 35 inches. Reaction is strongly acid or very strongly acid throughout, except in areas where the surface has been limed. In those areas the Ap horizon and the upper part of the B horizon range to neutral. The content of rounded chert fragments and quartzite gravel, by volume, ranges from 0 to 5 percent in the A, B, and Bx1 horizons and is generally only a few pebbles. The content of gravel, by volume, ranges from 15 to 70 percent in the IIBx2, IIB3, and IIC horizons.

The A horizon has hue of 10YR , value of 4 to 5, and chroma of 2 to 4. It is silt loam except in some severely eroded areas, where it is silty clay loam.

In some pedons the B1 horizon has hue of 10YR and 7.5YR, value of 4 or 5, and chroma of 4 to 6. The texture is silt loam.

The B2t horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. Light brownish gray mottles are in the lower 2 to 4 inches in some pedons. The texture is silty clay loam or silt loam.

The Bx1 horizon has hue of 10YR, value of 5 to 6, and chroma of 4 to 6. Mottles are in shades of gray, yellow, and brown. The texture is silt loam or light silty clay loam.

The IIBx2 horizon has hue of 10YR, value of 5 to 6, and chroma of 4 through 6. Mottles are in shades of gray, yellow, brown, and red. The texture of the fine earth part is silt loam, loam, clay loam, or silty clay loam.

The IIB3 horizon has hue of 7.5YR, 5YR, or 2.5YR, value of 4 or 5, and chroma of 1 to 6. It is commonly reddish and has mottles in shades of brown, gray, yellow, or red. The texture of the fine earth fraction is clay loam, silty clay loam, or clay.

In some pedons the Bx1 horizon is underlain by a IIC horizon that has hue of 10YR, 7.5YR, 5YR, or 2.5YR, value of 4 to 7, and chroma of 1 to 6. In this IIC horizon the texture of the fine earth fraction is silt loam, loam, clay loam, silty clay loam, sandy clay loam, or sandy loam.

In this survey area, the Lax soils are a taxadjunct to the Lax series because they have mixed mineralogy.

Lexington series

The Lexington series consists of deep, well drained soils that formed in a layer of loess 2 to 3 feet thick and in the underlying deposits of sandy clay loam, sandy loam, and loamy sand. These soils are on ridgetops and side slopes near Kentucky Lake and Lake Barkley. Permeability is moderate in the upper part of the profile and moderately rapid in the lower part. The slope range is 6 to 20 percent.

The Lexington soils are geographically closely associated with Brandon, Hammack, and Lax soils. The Brandon soils have gravelly Coastal Plain deposits underlying 2 to 3 feet of loess, and the Hammack soils have cherty, clayey limestone residuum underlying loess of about the same thickness. The Lax soils have a fragipan.

Typical pedon of Lexington silt loam, 6 to 12 percent slopes, in a forested area in the southwestern part of Lyon County, 1,000 feet north of Newby Cemetery, 1,500 feet north of Duncan Creek, and 1,500 feet south of Smith Bay at Kentucky Lake:

A1—0 to 1 inch; very dark gray (10YR 3/1) silt loam; moderate fine granular structure; very friable; many roots and pores; slightly acid; abrupt smooth boundary.

A2—1 inch to 10 inches; brown (10YR 5/3) silt loam; moderate fine granular structure; very friable; common roots and pores; few mica flakes and quartz grains; strongly acid; gradual wavy boundary.

B21t—10 to 31 inches; yellowish red (5YR 4/6) silty clay loam; strong brown (7.5YR 5/6) crushed; moderate medium subangular blocky structure; friable; few roots; common pores; clay films on ped faces; few quartz grains and mica flakes; few black concretions and concretionary staining; very strongly acid; clear wavy boundary.

IIB22t—31 to 42 inches; yellowish red (5YR 4/6) sandy clay loam; common fine distinct light yellowish brown (10YR 6/4) mottles; weak medium and coarse angular blocky structure; clay films on peds and in pores; few roots; common pores; common black concretions; very strongly acid; clear wavy boundary.

IIB'2t&A'2—42 to 74 inches; reddish brown (5YR 5/4) sandy loam (B'2t) and about 15 percent light yellowish brown (10YR 6/4) loamy sand (A'2) 1/4 to 1 inch thick; sandy loam part has weak medium subangular blocky structure; loamy sand part is loose and single grained, most sand grains uncoated; very friable; few patchy clay films on ped faces and in pores; strongly acid.

The solum is more than 60 inches thick. The material that formed in loess is commonly 24 to 36 inches thick and always less than 48 inches thick. Reaction ranges from medium acid to very strongly acid, except where the surface has been limed.

The A horizon is 5 to 10 inches thick and has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 1 through 4. The texture is silt loam except in severely eroded areas, where it is silty clay loam.

Some pedons have a B1 horizon, which has hue of 7.5YR or 10YR value of 4 or 5, and chroma of 3 through 6. The texture is silt loam.

The B21t horizon formed in loess and has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 4 through 8. The texture is silt loam or silty clay loam.

The IIB2t horizon has hue of 5YR or 2.5YR, value of 4 through 6, and chroma of 4 through 8. Few to common

mottles are in shades of brown and yellow in skeletons. The texture is sandy loam, loam, or sandy clay loam.

The IIB'2t&A'2 horizon is laminated with lamellae of loamy sand or sand and sandy loam or loam. The A'2 part makes up 15 to 85 percent of the volume and is loamy sand or sand. It has hue of 10YR, value of 5 through 7, and chroma of 3 through 8. The B'2t part is sandy loam or loam and is similar in color to the IIB2t horizon. Some pedons do not have a IIB'2t&A'2 horizon.

Lindside series

The Lindside series consists of deep, moderately well drained, moderately permeable soils on flood plains and in basins, depressions, and sinkhole areas on uplands. These soils formed in recent alluvial or colluvial material. The slope is 0 to 3 percent.

The Lindside soils are in close geographic association with Newark, Melvin, and Nolin on flood plains and in upland depressions; with Crider, Pembroke, Hammack, and Baxter soils on adjoining uplands; and with Elk, Otwell, Lawrence, and Robertsville soils on stream terraces. The Lindside soils are not as well drained as the Nolin soils and are better drained than the Newark and Melvin soils. The soils on nearby uplands and terraces have more horizon development and are more acid throughout the profile than the Lindside soils.

Typical pedon of Lindside silt loam, in a pasture, 100 feet east of a farm lane, 300 feet east-northeast of a tobacco barn, about 4,500 feet south of the junction of Kentucky Highways 128 and 124; or about 6 miles northeast of Cadiz:

Ap—0 to 7 inches; brown (10YR 4/3) silt loam; moderate fine granular structure; very friable; many fine roots; common fine pores; neutral; clear wavy boundary.

B21—7 to 18 inches; brown (7.5YR 4/4) silt loam; moderate medium subangular blocky structure parting to moderate fine granular; friable; common fine roots; common fine pores; slightly acid; clear wavy boundary.

B22—18 to 47 inches; brown (7.5YR 4/4) silt loam; common medium distinct light brownish gray (10YR 6/2) and pale brown (10YR 6/3) mottles; weak medium subangular blocky structure parting to weak fine granular; friable; few fine roots; common fine pores; few black concretions and black stains on peds; part of light brown gray and pale brown colors are silt coats on ped surfaces; slightly acid; clear wavy boundary.

IIB23t—47 to 60 inches; reddish brown (5YR 5/4) silty clay loam; few light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; few small roots; common fine pores; few black concretions; black stains and thin clay films on ped surfaces; much of light brown gray color is silt coats on peds; slightly acid.

The alluvium is more than 3 feet thick. On the larger flood plains, a C horizon, rather than the IIB horizon, underlies the solum. Reaction ranges from medium acid to mildly alkaline. Commonly, the profile does not contain coarse fragments, but in some pedons, the profile is as much as 5 percent coarse fragments. Low-chroma mottles are at a depth of 14 to 24 inches. Horizons that are dominantly gray are at a depth of more than 24 inches.

The A horizon has hue of 10YR or 7.5YR, value of 2 through 5, and chroma of 2 or 3. The texture is silt loam.

The B horizon has hue of 7.5YR through 2.5Y, value of 4 or 5, and chroma of 3 through 6. Mottles in shades of gray and brown are below 14 inches. The texture ranges from silty clay loam to very fine sandy loam, but it is commonly silt loam.

Some pedons have a C horizon that has hue of 7.5YR through 2.5Y, value of 4 through 6, and chroma of 1 through 4. It is weakly stratified silty clay loam, silt loam, loam, and fine sandy loam.

The IIB horizon has hue of 10YR to 5YR, value of 4 or 5, and chroma of 4 to 6. It has mottles in shades of gray and brown. Some pedons do not have a IIB horizon. These pedons are on the flood plains on the larger streams.

In this survey area the Lindside soils that are along the smaller streams and in upland depressions are a taxadjunct because, typically, they have a IIB horizon that is outside the range defined for the official Lindside series.

Melvin series

The Melvin series consists of deep, poorly drained, moderately permeable soils on flood plains and in upland depressions. These soils formed in mixed, medium-textured alluvium. The slope range is 0 to 2 percent.

The Melvin soils are on the same landscape as Nolin, Lindside, and Newark soils. Crider, Pembroke, Hammack, Baxter, and Nicholson soils are on nearby uplands; and Elk, Otwell, Lawrence, and Robertsville soils are on nearby stream terraces. The Melvin soils are more poorly drained than the Nolin, Lindside, and Newark soils. The nearby upland and terrace soils have more horizon development and are more acid throughout the profile than the Melvin soils.

Typical pedon of Melvin silt loam, 400 feet east of Kentucky Highway 818, 0.9 mile south of the intersection of Kentucky Highway 818 and U.S. Highway 62, about 5 miles east of Eddyville, 2,200 feet northeast of Liberty Church in Lyon County, Kentucky:

Ap—0 to 8 inches; grayish brown (10YR 5/2) silt loam; common fine faint brown and gray mottles; weak fine granular structure; very friable; many roots; slightly acid; clear smooth boundary.

B1g—8 to 14 inches; gray (10YR 5/1) silt loam; common medium prominent strong brown mottles; weak

moderate subangular blocky structure; friable; common roots; slightly acid; clear wavy boundary.
B2g—14 to 24 inches; gray (10YR 6/1) silt loam; common medium prominent yellowish brown mottles; weak medium subangular blocky structure; friable; few small black concretions; slightly acid; clear wavy boundary.
Cg—24 to 60 inches; gray (2.5Y N5/) silty clay loam; massive; friable; slightly acid.

The solum is 20 to 40 inches thick. Bedrock is at a depth of 60 to more than 200 inches. The content of coarse fragments is commonly 0 but ranges up to 5 percent below 30 inches and up to 20 percent below 40 inches. Reaction ranges from medium acid to mildly alkaline.

The A horizon has hue of 10YR through 5Y, value of 4 through 7, and chroma of 1 through 3. The texture is commonly silt loam but ranges to silty clay loam.

The B horizon matrix is light gray to dark gray. It has hue of 10YR through 5Y, and it has value of 6 to 7 and chroma of 0 through 2 or value of 4 or 5 and chroma of 0 or 1. Mottles are in shades of brown and red. The texture is silt loam or silty clay loam.

The C horizon has the same color and texture as the B horizon. Stratified loam, clay loam, silty clay loam, sandy loam, and their gravelly analogs are below a depth of 40 inches in some pedons.

Newark series

The Newark series consists of deep, somewhat poorly drained, moderately permeable soils on flood plains and in basins, depressions, and sinkhole areas on the uplands. These soils formed in mixed, medium-textured alluvium. The slope range is 0 to 2 percent.

The Newark soils are on the same landscape position as Nolin, Lindside, and Melvin soils. Baxter, Crider, Hammack, Nicholson, and Pembroke soils, which are on uplands, and Elk, Otwell, Lawrence, and Robertsville soils, which are on terraces, adjoin the Newark soils in places. These soils have more horizon development and are more acid throughout the profile than the Newark soils. The Nolin and Lindside soils are better drained. Melvin soils are more poorly drained.

Typical pedon of Newark silt loam in a cultivated field 0.8 mile north of Barkley Dam and 0.3 mile west of the Cumberland River, in Lyon County:

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam; moderate fine granular structure; friable; common fine roots; common fine pores; slightly acid.
B21—7 to 16 inches; dark grayish brown (10YR 4/2) silt loam; common medium distinct light brownish gray (10YR 6/2) mottles; weak moderate subangular blocky structure parting to moderate fine granular; friable; common fine roots; common fine pores; slightly acid; clear wavy boundary.
B22g—16 to 22 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct yellowish brown (10YR 5/6) and brown (10YR 5/3) mottles; weak fine subangular blocky structure; friable; few fine roots; common fine pores; slightly acid; clear wavy boundary.
B23g—22 to 35 inches; gray (10YR 6/1) silty clay loam; many medium prominent strong brown (7.5YR 5/6) and common medium distinct brown (7.5YR 4/4) and yellowish brown (10YR 5/4) mottles; weak medium angular blocky structure; firm; few fine roots; common fine pores; medium acid; clear wavy boundary.
Cg—35 to 60 inches; gray (10YR 6/1) silty clay loam; common medium distinct brown (7.5YR 4/4) and yellowish brown (10YR 5/6) mottles; massive; firm; few fine roots; few fine pores; medium acid.

The solum is 22 to 44 inches thick. Bedrock is at a depth of 60 to more than 200 inches. Commonly, there are no coarse fragments in the profile but in some pedons, coarse fragments make up as much as 5 percent of the material to a depth of 30 inches and as much as 15 percent of the material below that depth. Reaction ranges from medium acid to mildly alkaline throughout the profile.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 through 4. The texture is commonly silt loam but ranges to silty clay loam.

In the B21 horizon the matrix has hue of 7.5YR through 2.5Y, value of 4 or 5, and chroma of 2 through 4. Mottles are mostly in shades of brown and gray. The texture is silt loam or silty clay loam.

The B22g horizon has matrix in hue of 2.5Y through 7.5YR, value of 4 through 7, and chroma of 1 or 2. It has few to many mottles in shades of brown. The texture is silt loam or silty clay loam.

In the Cg horizon the matrix is similar in color to the B22g horizon. Some pedons have a C2 horizon, which has matrix and mottles that range from brown to gray. The texture of the C horizon is silt loam or silty clay loam. Some pedons have thin layers of loam, fine sandy loam, silty clay loam, or their gravelly analogs.

Nicholson series

The Nicholson series consists of deep, moderately well drained soils that have a fragipan. These soils are on uplands. They are moderately permeable above the fragipan and slowly permeable in the fragipan. They formed partly in loess and partly in clayey residuum of limestone, calcareous shale, and siltstone. The slope range is 0 to 12 percent.

The Nicholson soils are on the same landscape as the Hammack and Baxter soils. Unlike the Nicholson soils, the Hammack and Baxter soils do not have a fragipan. The Baxter soils formed in areas where little or no loess mantles cherty limestone residuum.

Typical pedon of Nicholson silt loam, 2 to 6 percent slopes, 50 feet north of Kentucky Highway 778 and 1.2 miles southeast of the junction of Kentucky Highways 778 and 276; or about 7 miles northeast of Cadiz:

Ap—0 to 3 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; very friable; many small roots; slightly acid; abrupt smooth boundary.

A2—3 to 8 inches; yellowish brown (10YR 5/4) silt loam; weak fine and medium subangular blocky structure parting to weak fine granular; very friable; common fine roots; strongly acid; clear wavy boundary.

B21t—8 to 21 inches; strong brown (7.5YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable; common fine roots; thin clay films on ped surfaces and in pores; very strongly acid; clear wavy boundary.

B22t—21 to 27 inches; yellowish brown (10YR 5/6) silt loam; common medium distinct pale brown (10YR 6/3) and light brownish gray (10YR 6/2) mottles; friable; few roots; few clay films with strong brown (7.5YR 5/6) on ped surfaces; very strongly acid; clear wavy boundary.

Bx1—27 to 45 inches; brown (7.5YR 5/4) silt loam; common medium distinct light brownish gray (10YR 6/2) and strong brown (7.5YR 5/6) mottles; moderate very coarse prismatic structure parting to moderate medium blocky; firm compact and brittle; few small roots between prisms; prisms coated with gray silt loam or silty clay loam; common clay films on peds; common black concretions and stains; very strongly acid; clear wavy boundary.

IIBx2—45 to 55 inches; brown (10YR 5/3) cherty silt loam, common medium faint pale brown (10YR 6/3) and yellowish brown (10YR 5/6) mottles; very coarse prismatic structure parting to weak fine angular blocky; firm compact and brittle; 45 percent chert fragments; 1 percent more than 3 inches; about one-third of gray streaks from the Bx1 horizon partly or completely penetrate this horizon, and a few roots are in these gray prism faces; strongly acid; clear wavy boundary.

IIB23—55 to 70 inches; red (2.5YR 4/6) silty clay; common large prominent pinkish gray (7.5YR 6/2), light gray (10YR 7/1), and reddish yellow (7.5YR 6/6) mottles; moderate fine and medium blocky structure; firm; 5 percent chert fragments, 3 percent more than 3 inches; clay films on peds and in pores; strongly acid.

The solum is 40 to 80 inches thick. Limestone, calcareous shale, or siltstone is at a depth of 60 to more than 100 inches. The fragipan is at a depth of 20 to 30 inches. Reaction ranges from very strongly acid to medium acid through the fragipan in umlimed areas. Below the fragipan, reaction ranges from strongly acid to mildly alkaline.

The A horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 through 4. The texture is silt loam.

The B2 horizon has hue of 10YR or 7.5YR, value of 4 and 5, and chroma of 3 through 6. In some pedons, silt coatings and grayish mottles are below the upper 10 inches of the argillic horizon. The texture is silt loam or silty clay loam.

The Bx horizon formed in loess and, in some pedons, in cherty or very cherty residuum. The material that formed in loess is 7 to 20 inches thick, and the material that formed in residuum is up to 15 inches thick.

This horizon has hue of 7.5YR through 2.5Y, value of 3 through 5, and chroma of 3 through 8. Mottles are in shades of gray and brown. The texture is silty clay loam or silt loam in the upper part and cherty or very cherty silt loam or silty clay loam in the lower part.

The IIB horizon has hue of 2.5YR through 2.5Y, value of 4 or 5, and chroma of 4 through 6. It has few to many mottles that have chroma of 2 or less. Reddish colors are dominant in this profile in all pedons except those in the vicinity of Buffalo and Cerulean, where shades of brown are dominant. The texture is silty clay, clay, and their cherty or very cherty analogs. The content of coarse fragments ranges from 0 to 50 percent.

Some pedons, mainly in the vicinity of Buffalo and Cerulean, have a IIC horizon. This horizon has the same color and texture range as the IIB horizon. The dominant colors are brownish, and the mottles are gray.

In this survey area, the Nicholson soils are a taxadjunct to the Nicholson series. They have more chert in the lower part of the solum than is defined in the range for the series.

Nolin series

The Nolin series consists of deep, well drained, moderately permeable soils that formed in mixed alluvium. These soils are on flood plains, in karst valleys, and in depressions on the uplands. The slope range is 0 to 2 percent.

The Nolin soils are geographically associated with Lindside, Newark, and Melvin soils, which are on flood plains and in depressions, and with the Crider, Pembroke, Hammack, Nicholson, Baxter, Elk, and Otwell soils, which are on uplands and stream terraces. The Nolin soils are better drained than the Lindside, Newark, and Melvin soils. The Nolin soils do not have as much clay in the subsoil as the Crider, Pembroke, Hammack, Nicholson, Baxter, Elk, and Otwell soils. Unlike the Nicholson and Otwell soils, the Nolin soils do not have a fragipan.

Typical pedon of Nolin silt loam, in a fescue pasture 1,800 feet south of the confluence of Spring Creek and the tributary stream 2,100 feet south of Kentucky Highway 1489 in Lake Barkley State Park; or about 5 miles southwest of Cadiz:

Ap—0 to 10 inches; brown (10YR 4/3) silt loam; moderate fine granular structure; very friable; many fine roots; medium acid; abrupt wavy boundary.
B21—10 to 33 inches; dark yellowish brown (10YR 4/4) silt loam, many medium faint brown (10YR 4/3) mottles; weak fine subangular blocky and weak fine granular structure; friable; common fine roots; few pebbles; slightly acid; clear wavy boundary.
B22—33 to 48 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct brown (10YR 4/3) and pale brown (10YR 6/3) mottles; weak fine subangular blocky structure; friable; few pebbles up to 1/2 inch long; medium acid; clear wavy boundary.
C1—48 to 76 inches; brown (10YR 4/3) very gravelly clay loam; structureless; very friable; 50 percent gravel; medium acid; diffuse wavy boundary.
C2—76 to 98 inches; brown (10YR 4/3) clay loam; structureless; friable; few pebbles; slightly acid; clear wavy boundary.

The solum is more than 40 inches thick. Alluvial deposits range from 40 inches to many feet in thickness. The content of gravel in the solum ranges from 0 to 5 percent. Reaction ranges from medium acid to mildly alkaline.

The Ap horizon has hue of 10YR, value of 4, and chroma of 2 or 3.

The B horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. In some pedons the horizon is mottled below a depth of 30 inches in hue of 10YR or 7.5YR, value of 4 through 6, and chroma of 2 through 4.

The C horizon has hue of 10YR, value of 4 or 5, and chroma of 2 through 4. The content of gravel ranges from 0 to 50 percent.

In some pedons a buried B horizon is at a depth of 40 to 98 inches.

Otwell series

The Otwell series consists of deep, moderately well drained soils that have a fragipan. These soils are on stream terraces. They are moderately permeable above the fragipan and very slowly permeable in the fragipan. They formed in loamy alluvium. The slope is 0 to 6 percent.

The Otwell soils are in close geographic association with Elk and Lawrence soils, which are on terraces, and the Nolin, Lindside, Newark, and Melvin soils, which are on bottoms. The Otwell soils are better drained than the Lawrence soils and not as well drained as the Elk soils. The Nolin soils are better drained than the Otwell soils. The Lindside soils are similar to Otwell soils in drainage but do not have a fragipan. The Newark and Melvin soils are not as well drained as the Otwell soils.

Typical pedon of Otwell silt loam, 0 to 2 percent slopes, in a cultivated field, 2 1/4 miles southwest of Macedonia Church, 300 feet south of Kentucky Highway 93, and 7,500 feet north of bridge over Cumberland River, in Lyon County:

Ap—0 to 8 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine granular structure; very friable; slightly acid; abrupt smooth boundary.
B21t—8 to 18 inches; strong brown (7.5YR 5/6) silty clay loam; common medium distinct pale brown mottles; moderate medium subangular blocky structure; friable; common clay films; strongly acid; clear wavy boundary.
B22t—18 to 22 inches; yellowish brown (10YR 5/6) silty clay loam; common medium distinct pale brown and light brownish gray mottles; moderate medium subangular blocky structure; firm; patchy clay films; very strongly acid; clear wavy boundary.
Bx—22 to 38 inches; light brownish gray (2.5YR 6/2) silty clay loam; many medium distinct brown (10YR 5/3) and strong brown (7.5YR 5/6) mottles; moderate very coarse prismatic structure parting to moderate medium subangular blocky; very firm compact and brittle; thick light brownish gray clay films on prism faces; thin clay films on peds; very strongly acid; gradual irregular boundary.
B3—38 to 60 inches; strong brown (7.5YR 5/6) silty clay loam; common medium prominent light brownish gray mottles; firm; strongly acid; weak fine subangular blocky structure.

The solum is 40 to more than 80 inches thick. Reaction is strongly acid or very strongly acid in unlimed areas.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4.

The B2t horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. Some pedons have mottles in chroma of 1 or 2 in the horizon above the fragipan but not within the top 10 inches of the argillic horizon. The texture is silt loam or silty clay loam.

The Bx horizon has hue of 10YR, 2.5Y, or 7.5YR, value of 4 through 7, and chroma of 2 through 6. The texture is silt loam, silty clay loam, loam, or clay loam. This horizon is firm or very firm and brittle.

The B3 horizon and, if present, the C horizon have the same color range as the Bx horizon. They are dominantly stratified and range from silty clay loam to silt loam to clay loam with minor layers of silty clay or loamy fine sand. Commonly these horizons do not contain gravel, but in some pedons the C horizon is as much as 25 percent gravel.

In this survey area, the Otwell soils are a taxadjunct to the Otwell series. They have a fragipan that dominantly has chroma of 2 and many high-chroma mottles. The range for the series specifies higher chroma and common or many mottles that have chroma of 2.

Pembroke series

The Pembroke series consists of deep, well drained, moderately permeable soils on uplands. These soils formed in a mixture of loess and highly weathered

residuum of limestone. The slope range is 2 to 20 percent, but on most of the acreage it is between 6 and 12 percent.

The Pembroke soils are on the same landscape as Crider and Fredonia soils. The Pembroke soils are deeper to bedrock and have a less clayey subsoil than the Fredonia soils. In the Crider soils the upper part of the subsoil formed in loess and is brown.

Typical pedon of Pembroke silt loam in an area of Fredonia-Pembroke silt loams, rocky, 2 to 12 percent slopes, in a pasture, 500 feet east of a farm lane, 450 feet north of a tobacco barn, 3,200 feet south of the junction of Kentucky Highways 128 and 124; or about 6 miles northeast of Cadiz:

Ap—0 to 6 inches; dark brown (10YR 3/3) silt loam; common medium faint brown (7.5YR 4/4) variegations; moderate fine granular structure; very friable; many fine roots; common fine pores; slightly acid; abrupt smooth boundary.

B21t—6 to 34 inches; reddish brown (2.5YR 4/4) silty clay loam; moderate medium subangular blocky structure; friable; common fine roots; common fine pores; clay films on peds and in pores are red (2.5YR 4/6); common black concretions and black stains on peds; many light reddish brown (5YR 6/3) silt coats on peds in the lower 3 inches; strongly acid; gradual wavy boundary.

B22t—34 to 46 inches; red (2.5YR 4/6) silty clay; few medium distinct light reddish brown (5YR 6/3) variegations; moderate fine and medium angular blocky structure; firm; many black stains on peds; common black concretions; few roots; common fine pores; thick clay films on ped surfaces; few small chert fragments and ghosts; strongly acid; clear wavy boundary.

B3—46 to 75 inches; dark red (2.5YR 3/6) clay; many fine prominent pinkish gray (5YR 6/2), brown (7.5YR 5/4), and white (10YR 7/1) variegations; weak fine angular blocky structure; very firm; many black concretions and many black stains; few fine roots; few fine pores; few clay films; few small chert fragments and ghosts; strongly acid.

The thickness of the solum and the depth to bedrock range from 60 to more than 120 inches. Reaction ranges from very strongly acid through medium acid, except in areas where the surface horizon is limed. Chert fragments, if present, make up 0 to 15 percent of the material, mainly in the lower part of the solum.

The A horizon has hue of 10YR through 5YR, value of 3, and chroma of 2 or 3; dry values are 1 or 2 units higher. The texture is silt loam or silty clay loam.

Some pedons have a B1 horizon 1 to 10 inches thick. This horizon has hue of 5YR, value of 4, and chroma of 4 or 6. The texture is silt loam or silty clay loam.

The B21t horizon has hue of 5YR or 2.5YR, value of 3 or 4, and chroma of 4 to 6. The texture is silt loam or silty clay loam. The consistence is friable or firm.

The B22t horizon has hue of 5YR through 10R, value of 3 or 4, and chroma of 6. It is silty clay loam or silty clay.

The B3 horizon has the same colors as the B22 horizon. In some pedons it has mottles in shades of brown and gray. The texture is silty clay or clay. The consistence is friable or firm.

Some pedons have a C horizon that has the same colors as the B3 horizon. In most pedons it is mottled in shades of brown and gray. The texture is silty clay or clay.

In this survey area the Pembroke soil in map unit PcC3 is a taxadjunct because the color of the surface layer is higher in value and chroma than defined in the range for the series.

Robertsville series

The Robertsville series consists of deep, poorly drained, slowly permeable soils that have a fragipan. These soils are on uplands and terraces. They formed in loess and old alluvial and colluvial material. The slope range is 0 to 2 percent.

The Robertsville soils are on the same landscape as Lawrence, Nicholson, and Sadler soils on uplands, Otwell and Elk soils on terraces, and Lawrence soils on uplands and terraces. In some places, they are in close geographic association with the Melvin soils, which are on bottoms. The Robertsville soils have a gray surface layer and subsoil and are more poorly drained than any of the other soils on uplands and stream terraces. The Melvin and Robertsville soils are poorly drained, but the Melvin soils have a subsoil that is moderately permeable. The Robertsville soils have a brittle, compact fragipan that is very slowly permeable.

Typical pedon of Robertsville silt loam, in a forest, 0.4 mile east of Kentucky Highway 778, 0.3 mile southwest of Dry Fork crossing at Kentucky Highway 93; or 2.0 miles southeast of Lamasco in Lyon County:

A1—0 to 1 inch; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; very friable; strongly acid; abrupt smooth boundary.

A2—1 inch to 6 inches; grayish brown (10YR 5/2) silt loam; weak coarse platy and weak fine subangular blocky structure; friable; very strongly acid; clear smooth boundary.

B2g—6 to 26 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct yellowish brown (10YR 5/6) mottles; moderate fine and medium subangular blocky structure; friable; very strongly acid; clear wavy boundary.

Bx—26 to 48 inches; light brownish gray (10YR 6/2) silty clay loam; common medium distinct light olive brown (2.5Y 5.4) mottles; weak very coarse prismatic structure parting to strong medium and fine angular blocky; very firm, brittle; thick clay films; very strongly acid; clear wavy boundary.

C—48 to 62 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct yellowish brown mottles; massive; friable; few chert fragments; medium acid.

The solum is 40 to about 60 inches thick. Bedrock, commonly limestone, is at a depth of 5 to more than 20 feet. The fragipan is at a depth of 15 to 30 inches. Reaction in unlimed areas ranges from strongly acid to extremely acid from the surface through the fragipan. Below the fragipan it is very strongly acid through neutral.

The A horizon has hue of 10YR, value of 4 to 7, and chroma of 1 through 3. Some pedons are mottled in shades of gray and brown.

In some pedons, the A2 horizon extends to the fragipan.

The B2g horizon has hue of 10YR through 2.5YR, value of 4 through 7, and chroma of 1 to 6. Mottles are in shades of brown and yellow. The texture is silt loam or silty clay loam.

The Bx horizon has the same color range as the B2g horizon. The texture is silty clay loam or silt loam. The consistence is very firm, compact, and brittle.

The C horizon has matrix and mottles in shades of gray and brown, it has no dominant matrix color and is evenly mottled. The texture is silt loam, silty clay loam, or silty clay. Some pedons have layers of sandy loam, loam, clay loam, or clay.

Sadler series

The Sadler series consists of deep, moderately well drained soils that have a fragipan. These soils are on uplands. They are moderately permeable above the fragipan and slowly permeable in the fragipan. They formed in loess and the underlying residuum of acid sandstone, siltstone, and shale. The slope range is 0 to 6 percent.

The Sadler soils are on the same landscape as the Zanesville, Nicholson, Lawrence, and Robertsville soils. Unlike the Sadler soils, the Zanesville and Nicholson soils do not have an A'&B horizon. The Zanesville and Nicholson soils also have a thicker, brighter colored B horizon above the fragipan than the Sadler soils. Lawrence and Robertsville soils are more poorly drained.

Typical pedon of Sadler silt loam, 2 to 6 percent slopes, in a cultivated field, 500 feet southeast of unnumbered road, 1 mile east of intersection of Kentucky Highway 124 and the unnumbered road, 1,500 feet south of Christian County line; or about 11 miles northeast of Cadiz:

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

B2t—8 to 24 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; friable; common roots; few clay films on peds and in pores; strongly acid; clear wavy boundary.

A'&B—24 to 26 inches; gray (10YR 6/1) silt loam A' material as thick coatings on yellowish brown (10YR 5/4) silt loam peds of B material, which makes up about 45 percent of this horizon; weak fine subangular blocky structure; friable; common small roots; common small pores; common small black concretions; very strongly acid; clear wavy boundary.

Bx—26 to 42 inches; brown (7.5YR 4/4) silt loam; many coarse distinct gray (10YR 6/1) mottles; weak very coarse prismatic structure parting to weak medium subangular blocky; very firm compact and brittle; thick gray clay films and silt coatings between prisms; very strongly acid; gradual irregular boundary.

IIC—42 to 60 inches; yellowish brown (10YR 5/6) fine sandy loam; extremely firm; massive; light gray clean silt and sand coats in pores and cracks; common black concretions; very strongly acid.

The solum is 40 to 70 inches thick. Acid sandstone, siltstone, or shale bedrock is at a depth of 50 to 100 inches. The fragipan is at a depth of 18 to 26 inches. Reaction is strongly acid or very strongly acid throughout in unlimed areas.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 through 4.

The B2 horizon has hue of 2.5Y through 7.5YR, value of 4 or 5, and chroma of 4 through 6. The material that has hue of 7.5YR is in the upper part of the horizon and is less than 5 inches thick. Some pedons have mottles in shades of gray and brown in the lower 2 to 4 inches. The texture is silt loam or light silty clay loam.

The A' part of the A'&B horizon has hue of 10YR or 2.5Y, value of 4 through 6, and chroma of 1 or 3. It makes up 55 to 70 percent of the horizon. It is silt or silt loam. The B part of the A'&B horizon has the same range of color and texture as the lower part of the B2t horizon.

The Bx horizon has matrix and mottle colors in hue of 7.5YR through 5Y, value of 4 through 6, and chroma of 1 through 6. It is very firm, compact, and brittle silty clay loam or silt loam. The clay films and silt coatings range from 1 to 20 millimeters in thickness.

The IIC horizon and the IIB horizon that is in some pedons have the same range in matrix and mottle colors as the Bx horizon. In some pedons they have some reddish mottles. The texture is silt loam, loam, fine sandy loam, clay loam, sandy clay loam, or silty clay loam. The content of sandstone or siltstone fragments ranges from 0 to 60 percent.

Saffell series

The Saffell series consists of deep, well drained, moderately permeable soils that formed in gravelly

material. These soils are on Coastal Plain uplands. The slope range is 6 to 60 percent.

The Saffell soils are geographically associated with the Brandon, Baxter, Clifty, and Lax soils. The Saffell soils differ from the Baxter soils in having rounded pebbles in all horizons instead of angular chert fragments. In the Brandon soils the material in the upper 3 feet of the profile formed in loess and do not have coarse fragments. The Clifty soils are on flood plains. The Lax soils have a fragipan.

Typical pedon of Saffell gravelly silt loam in an area of Brandon-Saffell complex, 20 to 50 percent slopes, in a forested area about 2.0 miles north of the Tennessee State line and 1.6 miles east of Joiner Chapel in the western part of Fort Campbell, Trigg County:

A1—0 to 2 inches; dark grayish brown (10YR 4/2) gravelly silt loam; weak fine granular structure; very friable; many small roots; 15 percent gravel; strongly acid; abrupt smooth boundary.

A2—2 to 7 inches; yellowish brown (10YR 5/4) gravelly silt loam; weak medium subangular blocky structure parting to weak fine granular; very friable; common small roots; 20 percent gravel; strongly acid; clear smooth boundary.

B1—7 to 15 inches; strong brown (7.5YR 5/6) gravelly loam; weak medium subangular blocky structure; very friable; common small roots; 20 percent gravel; very strongly acid; clear smooth boundary.

B21t—15 to 27 inches; reddish brown (5YR 5/4) very gravelly clay loam; common medium faint strong brown (7.5YR 5/6) mottles; weak fine angular blocky structure; firm; few small roots; many clay films on peds and pebbles; 65 percent gravel that is 10 percent pebbles larger than 3 inches; the lower 3 inches of this horizon is iron conglomerate; very strongly acid; clear smooth boundary.

B22t—27 to 44 inches; strong brown (7.5YR 5/8) very gravelly clay loam; common medium distinct very pale brown (10YR 7/3) and yellowish red (5YR 5/6) mottles; weak fine angular blocky structure; firm; occasional small roots; 60 percent gravel that is 10 percent pebbles larger than 3 inches; common clay films on peds and pebbles; very strongly acid; gradual wavy boundary.

B23t—44 to 70 inches; strong brown (7.5YR 5/8) very gravelly sandy clay loam; common medium distinct very pale brown (10YR 7/3) mottles; weak fine angular blocky structure; friable; common clay films on peds and pebbles; 50 percent gravel that is 10 percent pebbles larger than 3 inches; strongly acid.

The solum is 3 to 6 feet thick. The content of clay decreases with depths in the lower part of the solum or in the C horizon. Reaction is very strongly acid or strongly acid.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. The fine earth fraction is silt loam, loam, or fine sandy loam. The content of pebbles ranges from 5 to 50 percent.

The B1 horizon has hue of 10YR, 7.5YR, or 5YR, value of 4 or 5, and chroma of 4 to 6. It is similar to the A horizon in fine earth fraction and pebble content.

The B2t horizon has hue of 7.5YR, 5YR, or 2.5YR, value of 4 to 6, and chroma of 4 to 8. The fine earth fraction is sandy loam, sandy clay loam, or clay loam, and the content of pebbles ranges from 35 to 65 percent.

Some pedons have a C horizon of gravelly loamy sand or gravelly sandy loam that is 20 to 80 percent, by volume, gravel. The pebbles are mostly chert, but some are quartz, and there are cemented layers in some places. Nongravelly loamy, sandy, or clayey strata are at a depth of 5 to 10 feet in some pedons.

Weikert series

The Weikert series consists of shallow, well drained, moderately rapidly permeable soils on uplands. These soils formed in material weathered from siltstone, sandstone, and shale. They are mapped in complex with Frondorf and Wellston soils. The slope range is 6 to 50 percent.

The Weikert soils are on the same landscape as the Frondorf, Wellston, Zanesville, Fredonia, and Hagerstown soils. The Weikert soils are shallower to bedrock than those soils. They are commonly at slightly higher elevations than the Fredonia and Hagerstown soils.

Typical pedon of Weikert channery silt loam, in an area of Frondorf-Weikert-Wellston complex, 6 to 12 percent slopes, in a pasture 1,650 feet east of Illinois Central Railroad 0.6 mile southeast of Cerulean Springs; or about 9 miles northeast of Cadiz:

Ap—0 to 5 inches; brown (10YR 4/3) channery silt loam; moderate fine granular structure; very friable; many fine roots; 20 percent sandstone fragments; mainly between 5 and 15 centimeters; neutral; clear wavy boundary.

B2—5 to 11 inches; dark yellowish brown (10YR 4/4) channery silt loam; weak medium angular blocky and weak fine granular structure; 30 percent sandstone, siltstone, and shale fragments, mostly less than 25 centimeters; fine roots are common; strongly acid; clear wavy boundary.

C—11 to 19 inches; yellowish brown (10YR 5/6) very channery loam; few medium distinct pale brown (10YR 6/3) mottles; massive to weak fine angular blocky structure; 60 percent sandstone and siltstone; few roots; few clay films and silt coatings on fragments and in pores; strongly acid; clear wavy boundary.

R—19 inches; sandstone.

The solum is 8 to 20 inches thick. Bedrock is at a depth of 10 to 20 inches. Fragments of siltstone, shale,

and sandstone are throughout the profile. They make up 20 to 85 percent of the profile. In unlimed areas, reaction ranges from medium acid to very strongly acid.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 1 to 3. Undisturbed pedons have a thin dark A1 horizon underlain by a 2- to 5-inch-thick yellowish brown A2 horizon. The texture is channery silt loam or loam.

The B horizon has hue of 10YR and 7.5YR, value of 4 through 6, and chroma of 3 through 6. This horizon has the same range in texture as the A horizon. The consistence is friable or very friable, nonsticky or slightly sticky, and nonplastic or slightly plastic.

The fine earth part of the C horizon is much like the B horizon. It is very channery or very shaly. Some of the fragments are coated with silt films.

Wellston series

The Wellston series consists of deep, well drained, moderately permeable soils on uplands. These soils formed in loess and residuum of sandstone, siltstone, and shale. The slope is 6 to 50 percent.

The Wellston soils are on the same landscape as Weikert, Frondorf, Zanesville, Fredonia, and Hagerstown soils. Wellston soils are more than 40 inches deep to bedrock, while the Weikert, Frondorf, and Fredonia soils are less than 40 inches to bedrock. The Zanesville soils have a fragipan. The Hagerstown soils have a more clayey subsoil and formed in residuum of limestone.

Typical pedon of Wellston silt loam in an area of Frondorf-Weikert-Wellston complex, 12 to 20 percent slopes, in a pasture, 50 feet north of Kentucky Highway 1641; 2,400 feet south of Caldwell County; 1.6 miles north of Cerulean, or about 10 miles northeast of Cadiz:

A1—0 to 1 inch; dark grayish brown (10YR 4/2) silt loam; moderate fine granular structure; very friable; many roots; slightly acid; abrupt smooth boundary.

A2—1 inch to 5 inches; brown (10YR 5/3) silt loam; moderate fine granular structure; very friable; common roots; slightly acid; clear wavy boundary.

B1—5 to 10 inches; strong brown (7.5YR 5/6) silt loam; weak medium subangular blocky structure; friable; few roots; strongly acid; clear smooth boundary.

B21t—10 to 24 inches; yellowish red (5YR 5/6) silty clay loam; moderate medium subangular blocky structure; friable; few roots; clay films on ped surfaces; few small dark brown and black concretions; very strongly acid; clear wavy boundary.

B22t—24 to 46 inches; yellowish red (5YR 4/6) silty clay loam; medium prominent light gray (10YR 7/2) mottles; moderate medium subangular blocky structure; friable; few roots; clay films on peds and in pores; common dark brown concretions; strongly acid; clear wavy boundary.

IIB3—46 to 54 inches; yellowish red (5YR 5/6) clay loam; many medium distinct light yellowish brown (10YR 6/4), light brownish gray (10YR 6/2), and light gray (10YR 7/2) mottles; weak medium subangular blocky structure; friable; few roots; few dark brown concretions; strongly acid; abrupt irregular boundary.

R—54 inches; sandstone.

The solum is 32 to 55 inches thick. Sandstone, siltstone, or shale bedrock is at a depth of 40 to 60 inches. The loess mantle is commonly less than 30 inches thick. In some places there is no loess mantle. All horizons are strongly acid or very strongly acid, except where the surface has been limed.

The A horizon has hue of 10YR, value of 3 through 5, and chroma of 1 to 4.

The B1 horizon is 0 to 8 inches thick. The hue is 10YR or 7.5YR, the value is 4 or 5, and the chroma is 4 to 6.

The B2 horizon has hue of 10YR, 7.5YR, 5YR, value of 4 or 5, and chroma of 4 through 8. In some pedons, a few mottles below a depth of 2 feet are in shades of gray.

The IIB3 horizon and, if present, the IIB2 horizon, have hue of 10YR, 7.5YR, or 5YR, value of 4 to 5, and chroma of 3 to 6. Mottles in shades of pale brown or gray are few to many. The texture is silty clay loam, silt loam, or clay loam.

The IIC horizon, if present, has the same color and texture range as the IIB2 and IIB3 horizons.

In this survey area the Wellston soils are a taxadjunct because the color of the B horizon is one hue redder than that defined in the range for the official Wellston series.

Zanesville series

The Zanesville series consists of deep, well drained to moderately well drained soils that have a fragipan. These soils are on uplands. Permeability is moderate above the fragipan and moderately slow to slow in the fragipan. They formed in loess and residuum of sandstone, siltstone, and shale. The slope is 2 to 12 percent.

The Zanesville soils are on the same landscape as the Sadler, Nicholson, Wellston, Weikert, and Frondorf soils. The Zanesville soils have a thicker B horizon than the Sadler soils and do not have an A'&B horizon. The Nicholson soils have residuum of limestone below the fragipan. The Wellston, Weikert, and Frondorf soils do not have a fragipan. The Weikert soils are less than 20 inches deep to bedrock, and the Frondorf soils are 20 to 40 inches deep to bedrock.

Typical pedon of Zanesville silt loam, 2 to 6 percent slopes, in a cultivated field, in northeastern Trigg County; 800 feet west of Childress Cemetery, 3,350 feet southeast of the junction of Kentucky Highway 124 and the Christian County line, and 2,650 feet east of Brushy Creek:

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

B21t—6 to 19 inches; strong brown (7.5YR 5/6) silty clay loam; moderate fine and medium subangular blocky structure; friable; few fine roots; few fine continuous pores; common thin yellowish red (5YR 5/6) clay films on ped surfaces; strongly acid; clear wavy boundary.

B22t—19 to 29 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine and medium subangular blocky structure; friable; few fine roots; few clay films on peds and in the few fine pores; common pale brown (10YR 6/3) silt coatings on ped surfaces in the lower 4 inches; very strongly acid; abrupt smooth boundary.

Bx—29 to 42 inches; yellowish brown (10YR 5/4) silty clay loam; common fine distinct strong brown (7.5YR 5/6) and light brownish gray (10YR 6/2) mottles; very coarse prismatic structure parting to moderate fine subangular blocky; very firm, brittle, compact; thick light brownish gray (10YR 6/2) clay films on prisms; thin discontinuous white (10YR 8/1) silt coatings; strongly acid; clear wavy boundary.

IIC—42 to 65 inches; yellowish brown (10YR 5/6) clay loam; common medium distinct light brownish gray (10YR 6/2) and few medium prominent white (10YR 8/1) mottles; weak fine subangular blocky structure; firm and compact; 5 percent weathered brown sandstone and siltstone fragments; strongly acid.

R—65 inches; sandstone bedrock.

The solum is 35 to 60 inches thick. Siltstone, sandstone, and shale bedrock are at a depth of 40 to 80 inches. The fragipan is at a depth of 23 to 32 inches. Reaction is strongly acid or very strongly acid throughout, except in limed areas, where it ranges to mildly alkaline in the surface horizon.

The Ap horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. Some pedons in wooded areas have a 1- to 2-inch-thick A1 horizon that has hue of 10YR, value of 3 through 5, and chroma of 1 or 2 and an A2 horizon that has the same color range as the Ap horizon. The A horizon is silt loam, except in some severely eroded areas, where it is silty clay loam.

In the B2t horizon the hue is 7.5YR or 5YR in the upper part and 10YR in the lower part. The value is 4 or 5. The chroma is 4 to 6 except in the lower 3 to 6 inches, where there are mottles or silt coats that have chroma of 2 or 3. The texture is silty clay loam or silt loam.

The Bx horizon has hue of 10YR and 7.5YR, value of 4 or 5, and chroma of 3 through 6. It has few to many mottles that have chroma of 2 or less. It is very firm, compact, and brittle silty clay loam through fine sandy loam and is 0 to 15 percent coarse fragments below a depth of 30 inches.

The IIC horizon has the same range in color as the Bx horizon. It is 5 to 50 percent coarse fragments of siltstone, sandstone, or shale. Texture ranges from clay loam to sandy clay loam and their channery analogs.

formation of the soils

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

factors of soil formation

Soil is formed by the interaction of five factors: climate, plant and animal life, parent material, relief, and time. The relative importance of each factor differs from one area to another. Climate and plant and animal life are not likely to vary much over an area the size of one or two contiguous counties, but there may be many local differences in relief and parent material. Because the interrelationships among the five factors are complex, the effects of any one factor are hard to determine.

climate

The soils of Lyon and Trigg Counties formed in a humid, temperate climate, which is characteristic of the south-central part of the United States. Because the soils were moist and subject to leaching during formation, many of the soluble bases have been largely leached out of the solum, and clay minerals have been moved from the surface layer into the subsoil. As a result, most of the soils are acid and have a high content of clay in the subsoil. Because the soil is frozen for only short periods and to only a shallow depth, weathering and translocation of materials continue almost without interruption.

There is little variation in climate within the survey area, and climate has been a relatively uniform factor in soil formation. The variations in climate that affect soil formation result from differences in relief and aspect.

plant and animal life

The native vegetation, like the climate, is fairly uniform throughout the survey area and is relatively unimportant in accounting for the differences among the soils. The vegetation, however, had strong influence on the common characteristics of the soils.

The soils in this survey area formed under a dense cover of mixed hardwoods. In the Mississippian sections, some areas were originally prairie—an open area of tall grasses—which the early settlers inappropriately called "barrens". This prairie grassland was a relict community of a drier interglacial or postglacial period. It was perpetuated partly by herds of bison which grazed it and partly by Indians who periodically burned it to encourage the growth of grass, which attracted wildlife. The prairies that were formed and then abandoned turned to forestland under the new climate.

Most of the soils have an Ap horizon that has been mixed by plowing. Much of the acreage of the Brandon and Saffell soils, however, has not been plowed. These soils, therefore, have a dark gray or very dark grayish brown A1 horizon, indicating an accumulation of organic matter. This horizon covers a brown, leached A2 horizon.

Little is known about fungi and microlife in the survey area, although they undoubtedly had a strong influence on the formation and development of the soil. The greatest activity of earthworms and other small animals is in the uppermost layers of the soil. Mixing of soil material by rodents is not significant in this survey area.

The complex of living organisms in the soil has changed as a result of clearing the forests, cultivating the fields, introducing new species of plants, and artificially draining the wet areas. These activities of man affect the rate and direction of soil genesis. Some of the effects of man's activities on soil genesis may not become apparent for many centuries.

parent material

Several different kinds of parent material have been identified in Lyon and Trigg Counties. These are loess; alluvium; residuum of limestone, sandstone, and shale; and gravelly and loamy Coastal Plain deposits.

Loess, a windblown silty material, covers nearly all the upland areas. In thickness the loess averages about 3 feet on gently sloping uplands and ranges from little or none to more than 5 feet. Because the loess is extensive and is the uppermost layer in which soil-forming processes are active, it is the most important parent material for plant growth. Most of the upland soils formed in loess that is 2 to 3 feet thick. The Brandon soils formed in 20 to 40 inches of loess and in the underlying Coastal Plain deposits. The Crider and Hammack soils have about the same thickness of loess as the Brandon soils, but residuum of noncherty limestone underlies the loess in the Crider soils and residuum of cherty limestone underlies the loess in the Hammack soils.

The alluvium deposited by the Cumberland and Tennessee Rivers is washed from many kinds of parent material. The Nolin, Newark, Lindside, and Melvin soils formed in alluvium on first bottoms. These soils are

mostly medium acid to mildly alkaline loamy soils. The Otwell, Lawrence, and Robertsville soils which formed on the terraces of these streams, formed in alluvium from the tributary branches and creeks as well as from the rivers and in loess. In these soils, all horizons are strongly acid or very strongly acid except where the surface layer has been limed.

The Saffell soils on uplands formed in gravelly and very gravelly deposits of Coastal Plain origin. On terraces, these soils mostly formed in colluvial material from nearby slopes.

A fragipan tends to form in loamy parent material that has a low content of carbonates or no carbonates and a high content of silt or very fine sand. Because loess is a silty, loamy material and is the parent material of most upland soils, soils that have a fragipan are extensive in the two counties. The Nicholson and Otwell soils are examples.

The Brandon, Crider, Hammack, and Wellston soils, which formed partly in loess, have a higher base saturation than the Saffell soils, which formed in Coastal Plain deposits. This is at least partly because the loess deposit is more recent. The percentage of base saturation and other chemical data suggest that the more poorly drained soils that formed in loess have been subject to more severe weathering and leaching than the better drained ones. Therefore, natural fertility varies not only with parent material, but also with relief and time.

relief

Relief influences the formation of soils and is responsible for many of the differences among the soils in this survey area. It affects drainage, runoff, erosion, and the thickness of the soil material. Relief ranges from nearly level to steep.

Most poorly drained and very poorly drained soils are nearly level. In these areas, runoff is slow, and the soils are saturated for long periods. Little or no soil material is lost through geologic erosion. The Robertsville and Melvin soils are examples. They have a dominantly grayish color, which is characteristic of poorly drained soils.

Most somewhat poorly drained soils are also nearly level. The Newark soils, for example, are on flood plains. They have a water table that extends into the upper part of the subsoil during wet seasons. Lawrence soils, on uplands of stream terraces, are somewhat poorly drained and have a fluctuating perched water table above the slowly permeable fragipan. The subsoil contains brownish colors, as a result of oxidation, and grayish colors, as a result of reduction.

Most moderately well drained soils are nearly level or gently sloping. The Nicholson and Otwell soils are examples. They generally do not receive runoff from areas of other soils. Water moves freely through the upper part of the subsoil, but its movement is restricted below a depth of about 2 feet by a fragipan. Above the fragipan, the soil material mostly has a brownish color.

Well drained soils range from nearly level to steep. The Elk and Nolin soils, for example, are nearly level. Water moves through these soils at a moderate rate, and the soils are saturated for only brief periods. Among the well drained soils that are sloping to steep are the Brandon, Saffell, Frondorf, Weikert, and Wellston soils. In these soils, geologic erosion is rapid. Only a small amount of water penetrates the steep soils; most of the water is lost through runoff.

time

Time is required for a soil to be formed from parent material. Differences in length of time of soil formation are responsible for most of the soil differences in the survey area not attributed to parent material or relief. The soils range from young to old. Even now, most of the areas along drainageways or bottom lands receive fresh sediments frequently.

Geologically, most of the soils in Lyon and Trigg Counties range from young to mature. The best criteria for judging the age of a soil are the relative thickness and degree of development of the horizons. If soils show moderate or strong horizon development, they must be judged as mature or "old". The greatest difference in age can be seen in mature soils like Baxter that formed in residuum of cherty limestone and young soils like Nolin that formed in alluvium.

Mature soils in the survey area formed in loess. Loess was deposited during the waning of the ice sheets and during the late Wisconsin glacial stage (*15*). Thus, the upper parts of the Brandon, Crider, Frondorf, Hammack, Lawrence, Lax, Nicholson, Otwell, Robertsville, and Wellston soils have been developing for about 11,000 to 14,000 years. The residuum underlying these soils is from several sources and was subjected to weathering before the loess was deposited.

All of these soils have distinct soil horizons and some properties that are common to soils of about the same age. Most of the bases have been leached from the solum, and as a result, the soils are acid. Organic matter has accumulated at the surface, forming a distinct A1 horizon. The soils contain a leached A2 horizon and have a B2 horizon of clay accumulation. The Lawrence, Lax, Nicholson, Otwell, and Robertsville soils have a fragipan. The Lawrence and Robertsville soils have grayish colors and iron concretions, which are characteristics of gleyed soils.

morphology of soils

Most of the soils in this survey area have strongly developed horizons. The exceptions are some of the alluvial soils, such as the Nolin and Lindside soils, or soils that formed in very gravelly material, such as Saffell soils, which have weakly developed horizons.

The differentiation of horizons is the result of several processes. The most important of these are (1)

accumulation of organic matter, (2) leaching of carbonates and salts, (3) chemical weathering of the primary minerals and parent materials into siliceous clay materials, (4) translocation of silicate clay minerals and probably some silt-size particles from one horizon to another, and (5) chemical change and transfer of iron (*17*). One or more of these processses has taken place in all the soils in the survey area. The degree of activity of each process, however, varies from soil to soil.

In all the soils, some organic matter has accumulated to form an A1 horizon. In most places, however, the A1 horizon has become part of an Ap horizon as a result of plowing and cultivation. In severely eroded areas, the original A horizon has been lost or nearly all lost. The content of organic matter accumulated ranges from low to medium. In most severely eroded soils, the organic matter content is very low.

Leaching of carbonates and salts has occurred in all the soils, but it has been of little importance in horizon differentiation. The effects have been indirect; the leaching has permitted translocation of silicate minerals in most of the soils, and most are deeply leached of carbonates and salts. This is reflected in the fact that most of the soils are strongly acid or very strongly acid.

The main result of the weathering of primary minerals to silicate minerals, largely by the process of hydrolysis, is the production of clays that have a mixed mineralogy. In the Brandon, Crider, Hammack, Lawrence, Lax, Nicholson, and Robertsville soils, fairly large amounts of montmorillonite, illite, vermiculite, kaolinite, and quartz are in the coarse clay fraction (2.0 to 0.20 millimeters) of the A and B horizons. Montmorillonite is the predominant mineral in the medium and fine clay of all the soils that formed in loess and is most abundant in the poorly drained soils. Vermiculite is more abundant in the poorly drained soils than in the well drained soils. Illite is generally more abundant in the well drained soils than in the poorly drained soils.

The translocation and development in place of silicate clay minerals have had a strong influence on the development of horizons in the soils on uplands and stream terraces. Clay has moved, in part, from the A to the B horizon. This is true of all soils that have a moderate to strongly developed B horizon and of some soils that have a weakly developed B horizon. The greatest accumulation of clay is in the upper part of the B horizon of the well drained Brandon, Crider, and Hammack soils, but the greatest accumulation of clay is in the lower part of the B horizon or the fragipan of the somewhat poorly drained Lawrence soils and the poorly drained Robertsville soils.

The reduction and transfer of iron has occurred to some degree in all soils that have impeded drainage. This process, known as gleying, has been of great importance in the level and gently sloping soils. It has particularly affected the Melvin, Robertsville, Lawrence, and Newark soils and the fragipan of the Lax and Nicholson soils.

Iron that is reduced under conditions of poor aeration generally becomes mobile. It can move from the soil entirely, but in this survey area it mostly has moved only a short distance, stopping either in the horizon where it originated or in a lower horizon. Part of this iron can be reoxidized and is segregated to form the yellowish brown or strong brown mottles common in the gleyed horizons of all soils that have impeded drainage.

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glossary

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

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

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

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

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

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

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 40-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 2.4
Low	2.4 to 3.2
Moderate	3.2 to 5.2
High	more than 5.2

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

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

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

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

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

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

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

Channery soil. A soil that is, by volume, more than 15 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches along the longest axis. A single piece is called a fragment.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15.2 to 38.1 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

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

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—
Loose.—Noncoherent when dry or moist; does not hold together in a mass.
Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.
Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.
Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.
Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.
Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.
Soft.—When dry, breaks into powder or individual grains under very slight pressure.
Cemented.—Hard; little affected by moistening.

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

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

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or arresting grazing for a prescribed period.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

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

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:
Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.
Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.
Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.
Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.
Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.
Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.
Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

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

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.
Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and

resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion. *Erosion* (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fine textured soil. Sandy clay, silty clay, and clay.

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

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

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

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

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

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

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

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

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an upper case letter represents the major horizons. Numbers or lower case letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual*. The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Roman numeral II precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

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

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

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

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

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Large stones (in tables). Rock fragments 3 inches (7.5 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

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

Low strength. The soil is not strong enough to support loads.

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

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

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

Moderately coarse textured soil. Sandy loam and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

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

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

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

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.20 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

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

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

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction

because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

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

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

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

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

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

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

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

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

Sinkhole. A depression in the landscape where limestone has been dissolved.

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

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

Slope (in tables). Slope is great enough that special practices are required to insure satisfactory performance of the soil for a specific use.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 mm in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

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

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil

from wind and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

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

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

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

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

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

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

tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Recorded in the period 1951-75 at Princeton, Kentucky]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days[1]	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January	45.8	25.2	35.5	72	-6	8	4.64	2.61	6.29	7	2.9
February	50.1	27.8	38.9	75	-1	17	3.92	2.21	5.31	7	2.8
March	58.6	34.9	46.8	82	12	110	5.00	2.44	7.08	8	2.7
April	70.9	45.8	58.4	87	24	267	4.56	3.04	5.94	8	.1
May	79.1	54.2	66.7	92	33	518	4.11	2.44	5.59	7	.0
June	86.8	62.3	74.6	98	46	738	3.37	1.46	4.91	6	.0
July	89.9	66.0	78.0	100	51	868	3.78	2.35	5.05	6	.0
August	89.2	64.4	76.8	100	49	831	3.44	1.69	4.86	5	.0
September	83.2	57.4	70.3	97	38	609	2.98	1.28	4.36	5	.0
October	73.4	45.5	59.5	90	25	307	2.40	1.18	3.39	5	.0
November	59.3	35.5	47.4	81	12	56	3.72	1.92	5.19	7	.6
December	48.5	28.6	38.6	71	1	22	4.37	2.58	5.96	8	1.6
Yearly:											
Average	69.6	45.6	57.6	---	---	---	---	---	---	---	---
Extreme	---	---	---	102	-10	---	---	---	---	---	---
Total	---	---	---	---	---	4;351	46.29	38.85	52.91	79	10.7

[1]A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50° F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Recorded in the period 1951-75 at Princeton, Kentucky]

Probability	Temperature		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	April 11	April 18	May 4
2 years in 10 later than--	April 6	April 14	April 27
5 years in 10 later than--	March 28	April 7	April 15
First freezing temperature in fall:			
1 year in 10 earlier than--	October 26	October 18	October 4
2 years in 10 earlier than--	October 31	October 23	October 9
5 years in 10 earlier than--	November 8	October 31	October 19

TABLE 3.--GROWING SEASON

[Recorded in the period 1951-75 at Princeton, Kentucky]

Probability	Daily minimum temperature		
	Higher than 24°F	Higher than 28°F	Higher than 32°F
	Days	Days	Days
9 years in 10	204	190	162
8 years in 10	211	195	170
5 years in 10	224	207	186
2 years in 10	238	218	202
1 year in 10	245	223	211

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Lyon County	Trigg County	Total-- Area	Total-- Extent
		Acres	Acres	Acres	Pct
BaE	Baxter-Hammack complex, 20 to 30 percent slopes	23,250	36,060	59,310	14.2
BaF	Baxter-Hammack complex, 30 to 60 percent slopes	2,150	1,630	3,780	0.9
BrC	Brandon silt loam, 6 to 12 percent slopes	5,600	20,200	25,800	6.2
BrD	Brandon silt loam, 12 to 20 percent slopes	4,800	7,760	12,560	3.0
BsC3	Brandon silty clay loam, 6 to 12 percent slopes, severely eroded	100	740	840	0.2
BsD3	Brandon silty clay loam, 12 to 25 percent slopes, severely eroded	390	1,250	1,640	0.4
BxE	Brandon-Saffell complex, 20 to 50 percent slopes	16,000	28,400	44,400	10.6
Cp	Clifty gravelly silt loam	3,500	7,500	11,000	2.6
CrA	Crider silt loam, 0 to 2 percent slopes	0	280	280	*
CrB	Crider silt loam, 2 to 6 percent slopes	1,500	12,500	14,000	3.3
CsC	Crider-Pembroke silt loams, 6 to 12 percent slopes	1,320	10,000	11,320	2.7
ElA	Elk silt loam, 0 to 2 percent slopes	430	400	830	0.2
ElB	Elk silt loam, 2 to 6 percent slopes	250	1,130	1,380	0.3
FdB	Fredonia-Pembroke silt loams, rocky, 2 to 12 percent slopes	0	2,570	2,570	0.6
FrD	Fredonia-Rock outcrop complex, 12 to 20 percent slopes	20	290	310	0.1
FwC	Frondorf-Weikert-Wellston complex, 6 to 12 percent slopes	0	380	380	0.1
FwD	Frondorf-Weikert-Wellston complex, 12 to 20 percent slopes	0	690	690	0.2
FwF	Frondorf-Weikert-Wellston complex, 20 to 50 percent slopes	0	170	170	*
HaC	Hagerstown silt loam, 6 to 12 percent slopes	0	220	220	*
HbC3	Hagerstown silty clay loam, 6 to 12 percent slopes, severely eroded	0	170	170	*
HcD	Hagerstown-Fredonia silt loams, very rocky, 12 to 20 percent slopes	20	1,900	1,920	0.5
HmB	Hammack silt loam, 2 to 6 percent slopes	370	7,890	8,260	2.0
HxC	Hammack-Baxter complex, 6 to 12 percent slopes	14,300	36,700	51,000	12.2
HxC3	Hammack-Baxter complex, 6 to 12 percent slopes, severely eroded	2,400	6,600	9,000	2.2
HxD	Hammack-Baxter complex, 12 to 20 percent slopes	14,450	19,750	34,200	8.2
HxD3	Hammack-Baxter complex, 12 to 20 percent slopes, severely eroded	5,900	2,300	8,200	2.0
La	Lawrence silt loam	480	600	1,080	0.3
LbB	Lax silt loam, 2 to 6 percent slopes	2,100	6,800	8,900	2.1
LbC	Lax silt loam, 6 to 12 percent slopes	4,000	4,350	8,350	2.0
LcC3	Lax silty clay loam, 6 to 12 percent slopes, severely eroded	170	1,500	1,670	0.4
LeC	Lexington silt loam, 6 to 12 percent slopes	340	40	380	0.1
LeC3	Lexington silt loam, 6 to 12 percent slopes, severely eroded	250	0	250	*
LfD	Lexington complex, 12 to 20 percent slopes	450	90	540	0.1
Ln	Lindside silt loam	2,900	6,640	9,540	2.3
Me	Melvin silt loam	650	430	1,080	0.3
Ne	Newark silt loam	2,800	1,510	4,310	1.0
NhA	Nicholson silt loam, 0 to 2 percent slopes	20	100	120	*
NhB	Nicholson silt loam, 2 to 6 percent slopes	13,400	13,900	27,300	6.5
NhC	Nicholson silt loam, 6 to 12 percent slopes	5,600	1,800	7,400	1.8
NlC3	Nicholson silty clay loam, 6 to 12 percent slopes, severely eroded	1,450	570	2,020	0.5
No	Nolin silt loam	8,450	17,840	26,290	6.3
OtA	Otwell silt loam, 0 to 2 percent slopes	240	150	390	0.1
OtB	Otwell silt loam, 2 to 6 percent slopes	400	520	920	0.2
PcC3	Pembroke-Crider complex, 6 to 12 percent slopes, severely eroded	110	1,080	1,190	0.3
Pg	Pits, gravel	40	80	120	*
Pt	Pits, quarries	0	120	120	*
Ro	Robertsville silt loam	600	580	1,180	0.3
SaA	Sadler silt loam, 0 to 2 percent slopes	0	150	150	*
SaB	Sadler silt loam, 2 to 6 percent slopes	0	1,160	1,160	0.3
SgC	Saffell very gravelly silt loam, 6 to 12 percent slopes	80	400	480	0.1
SgF	Saffell very gravelly silt loam, 20 to 60 percent slopes	950	5,600	6,550	1.6
ZaB	Zanesville silt loam, 2 to 6 percent slopes	0	820	820	0.2
ZaC	Zanesville silt loam, 6 to 12 percent slopes	0	1,200	1,200	0.3
	Water	490	330	820	0.2
	Total	142,720	275,840	418,560	100.0

* Less than 0.1 percent.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Map symbol and soil name	Corn	Soybeans	Tobacco	Wheat	Grass-legume hay	Pasture
	Bu	Bu	Lb	Bu	Ton	AUM*
BaE---- Baxter-Hammack	---	---	---	---	---	4.5
BaF---- Baxter-Hammack	---	---	---	---	---	---
BrC---- Brandon	85	30	2,100	30	4.0	7.0
BrD---- Brandon	---	---	---	---	2.5	5.0
BsC3---- Brandon	---	---	---	---	2.5	5.0
BsD3---- Brandon	---	---	---	---	---	3.5
BxE---- Brandon-Saffell	---	---	---	---	---	---
Cp---- Clifty	110	35	2,200	35	4.5	9.0
CrA---- Crider	135	45	3,200	45	5.0	10.0
CrB---- Crider	130	45	3,200	45	5.0	10.0
CsC---- Crider-Pembroke	120	40	2,900	40	4.5	9.0
ElA---- Elk	135	45	3,200	45	4.5	9.0
ElB---- Elk	130	45	3,200	45	4.5	9.0
FdB---- Fredonia-Pembroke	100	30	2,500	40	4.0	8.0
FrD---- Fredonia-Rock outcrop	---	---	---	---	---	---
FwC---- Frondorf-Weikert-Wellston	85	30	1,600	30	3.0	6.0
FwD---- Frondorf-Weikert-Wellston	---	---	---	---	2.5	5.0
FwF---- Frondorf-Weikert-Wellston	---	---	---	---	---	---
HaC---- Hagerstown	120	35	2,800	40	4.0	8.0
HbC3---- Hagerstown	95	---	---	35	3.5	7.0
HcD---- Hagerstown-Fredonia	---	---	---	---	3.0	6.0

See footnote at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Corn	Soybeans	Tobacco	Wheat	Grass-legume hay	Pasture
	Bu	Bu	Lb	Bu	Ton	AUM*
Hmb---------- Hammack	120	35	2,800	45	4.5	9.0
HxC---------- Hammack-Baxter	90	30	2,400	40	4.5	9.0
HxC3---------- Hammack-Baxter	80	25	1,500	30	3.5	7.0
HxD---------- Hammack-Baxter	70	20	1,500	30	3.5	7.0
HxD3---------- Hammack-Baxter	---	---	---	---	3.0	6.0
La---------- Lawrence	80	35	1,700	---	3.0	6.0
LbB---------- Lax	110	40	2,000	30	3.5	7.0
LbC---------- Lax	90	30	1,800	30	3.5	6.5
LcC3---------- Lax	70	20	1,500	25	3.0	6.0
LeC---------- Lexington	60	25	---	35	3.0	6.5
LeC3---------- Lexington	---	---	---	---	2.5	5.0
LfD---------- Lexington	---	---	---	---	2.5	5.0
Ln---------- Lindside	130	45	2,800	40	4.5	9.0
Me---------- Melvin	80	35	---	---	3.5	7.0
Ne---------- Newark	125	40	2,500	45	4.5	8.5
NhA---------- Nicholson	125	40	2,500	40	3.5	7.0
NhB---------- Nicholson	130	40	3,000	40	3.5	7.0
NhC---------- Nicholson	110	35	2,700	35	3.5	6.5
NlC3---------- Nicholson	70	30	1,800	30	3.0	5.5
No---------- Nolin	135	45	3,300	45	4.5	9.0
OtA---------- Otwell	115	40	2,200	40	3.5	7.0
OtB---------- Otwell	115	40	2,500	40	3.5	7.0
PcC3---------- Pembroke-Crider	100	30	2,400	30	4.0	8.0

See footnote at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Corn	Soybeans	Tobacco	Wheat	Grass-legume hay	Pasture
	Bu	Bu	Lb	Bu	Ton	AUM*
Pg, Pt. Pits						
Ro---------- Robertsville	70	30	---	---	3.0	5.5
SaA---------- Sadler	115	40	2,300	40	3.5	7.0
SaB---------- Sadler	115	40	2,500	40	3.5	7.0
SgC---------- Saffell	70	25	---	30	3.0	6.0
SgF---------- Saffell	---	---	---	---	---	3.0
ZaB---------- Zanesville	125	40	2,700	40	3.5	7.0
ZaC---------- Zanesville	115	30	2,400	30	3.5	7.0

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

TABLE 6.--CAPABILITY CLASSES AND SUBCLASSES

[Miscellaneous areas are excluded. Dashes indicate no acreage]

Class	Total acreage	Major management concerns (Subclass)		
		Erosion (e)	Wetness (w)	Soil problem (s)
		Acres	Acres	Acres
I:				
Lyon County	8,880	---	---	---
Trigg County	18,520	---	---	---
II:				
Lyon County	27,480	18,020	5,960	3,500
Trigg County	60,770	44,720	8,550	7,500
III:				
Lyon County	32,290	31,160	1,130	---
Trigg County	78,110	77,080	1,030	---
IV:				
Lyon County	19,610	18,930	600	80
Trigg County	31,770	30,390	580	400
V:				
Lyon County	---	---	---	---
Trigg County	---	---	---	---
VI:				
Lyon County	34,420	34,420	---	---
Trigg County	48,800	48,800	---	---
VII:				
Lyon County	19,510	18,540	---	970
Trigg County	37,340	31,450	---	5,890
VIII:				
Lyon County	---	---	---	---
Trigg County	---	---	---	---

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Map symbol and soil name	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
BaE:*								
Baxter	2r	Moderate	Moderate	Slight	Severe	Black oak	77	Eastern white pine, loblolly pine, shortleaf pine, black locust, yellow-poplar.
						Yellow-poplar	93	
						Shortleaf pine	80	
Hammack	2r	Moderate	Moderate	Slight	Severe	Northern red oak	82	Yellow-poplar, black walnut, shortleaf pine, loblolly pine, Virginia pine.
						White oak	82	
						Yellow-poplar	92	
BaF:*								
Baxter	2r	Severe	Severe	Slight	Severe	Black oak	77	Eastern white pine, shortleaf pine, loblolly pine, black locust.
						Yellow-poplar	93	
						Virginia pine	64	
Hammack	2r	Severe	Severe	Slight	Severe	Northern red oak	80	Yellow-poplar, black walnut, shortleaf pine.
						White oak	80	
						Yellow-poplar	90	
BrC, BsC3 Brandon	3o	Slight	Slight	Slight	Moderate	Northern red oak	66	Virginia pine, shortleaf pine, loblolly pine.
						Shortleaf pine	70	
						Loblolly pine	80	
						Virginia pine	70	
BrD, BsD3:								
Brandon (north aspect)	3r	Moderate	Moderate	Slight	Moderate	Northern red oak	66	Virginia pine, shortleaf pine, loblolly pine.
						Shortleaf pine	70	
						Virginia pine	70	
						Loblolly pine	80	
Brandon (south aspect)	4r	Moderate	Moderate	Moderate	Slight	Northern red oak	60	Virginia pine, shortleaf pine, loblolly pine.
						Shortleaf pine	60	
						Loblolly pine	70	
						Virginia pine	60	
BxE:*								
Brandon (north aspect)	3r	Severe	Severe	Slight	Moderate	Northern red oak	66	Virginia pine, shortleaf pine, loblolly pine.
						Shortleaf pine	70	
						Loblolly pine	80	
						Virginia pine	70	
Brandon (south aspect)	4r	Moderate	Moderate	Moderate	Slight	Northern red oak	60	Virginia pine, shortleaf pine, lobloly pine.
						Shortleaf pine	60	
						Loblolly pine	70	
						Virginia pine	60	
Saffell	4f	Severe	Severe	Severe	Slight	Loblolly pine	70	Loblolly pine, shortleaf pine, eastern redcedar, Virginia pine.
						Shortleaf pine	60	
						Eastern redcedar	---	
						White oak	50	
						Chestnut oak	---	
Cp Clifty	1o	Slight	Slight	Slight	Severe	Pin oak	95	Yellow-poplar, sweetgum, white ash, eastern cottonwood, shortleaf pine, eastern white pine, cherrybark oak.
						Sweetgum	95	
						Shortleaf pine	76	
						Yellow-poplar	72	
						Northern red oak	64	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
CrA, CrB---------- Crider	1o	Slight	Slight	Slight	Severe	Northern red oak----	88	Eastern white pine, yellow-poplar, black walnut, loblolly pine, white ash.
						Yellow-poplar-------	97	
						Virginia pine-------	78	
						Shortleaf pine------	80	
CsC:*								
Crider----------	1o	Slight	Slight	Slight	Severe	Northern red oak----	88	Eastern white pine, yellow-poplar, black walnut, loblolly pine, white ash.
						Yellow-poplar-------	97	
						Virginia pine-------	78	
						Shortleaf pine------	80	
Pembroke----------	1o	Slight	Slight	Slight	Severe	Northern red oak----	95	Yellow-poplar, black walnut, white ash, eastern white pine, shortleaf pine, loblolly pine.
						Yellow-poplar-------	90	
						Virginia pine-------	85	
						Shortleaf pine------	85	
ElA, ElB---------- Elk	2o	Slight	Slight	Slight	Severe	Pin oak-------------	96	Eastern white pine, yellow-poplar, black walnut, loblolly pine, cherrybark oak.
						Yellow-poplar-------	90	
						Shortleaf pine------	80	
						Eastern white pine--	90	
FdB:*								
Fredonia----------	3c	Moderate	Moderate	Slight	Moderate	Northern red oak----	70	Virginia pine, eastern redcedar.
						Eastern redcedar----	50	
Pembroke----------	1o	Slight	Slight	Slight	Severe	Northern red oak----	95	Yellow-poplar, black walnut, white ash, eastern white pine, shortleaf pine, loblolly pine.
						Yellow-poplar-------	90	
						Virginia pine-------	85	
						Shortleaf pine------	85	
FrD:*								
Fredonia----------	3x	Moderate	Severe	Slight	Moderate	Northern red oak----	70	Virginia pine, eastern redcedar.
						Eastern redcedar----	50	
Rock outcrop.								
FwC:*								
Frondorf----------	2o	Slight	Slight	Slight	Severe	Black oak-----------	76	Yellow-poplar, shortleaf pine, black walnut, eastern white pine, loblolly pine.
						Virginia pine-------	78	
						Sweetgum------------	82	
Weikert-----------	4d	Slight	Slight	Severe	Slight	Black oak-----------	65	Virginia pine, shortleaf pine, eastern white pine.
						Virginia pine-------	60	
						Yellow-poplar-------	88	
Wellston----------	2o	Slight	Slight	Slight	Severe	Northern red oak----	75	Eastern white pine, black walnut, yellow-poplar, white ash.
						Yellow-poplar-------	89	
						Virginia pine-------	69	
FwD (north aspect):*								
Frondorf----------	2r	Moderate	Moderate	Slight	Severe	Black oak-----------	76	Yellow-poplar, shortleaf pine, black walnut, eastern white pine, loblolly pine.
						Virginia pine-------	78	
						Sweetgum------------	82	
Weikert-----------	4d	Slight	Moderate	Severe	Slight	Black oak-----------	65	Eastern white pine, shortleaf pine, Virginia pine.
						Virginia pine-------	60	
						Yellow-poplar-------	88	
Wellston----------	2r	Moderate	Moderate	Slight	Severe	Northern red oak----	75	Eastern white pine, black walnut, yellow-poplar, white ash.
						Yellow-poplar-------	89	
						Virginia pine-------	69	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
FwD (south aspect):*								
Frondorf	3r	Moderate	Moderate	Moderate	Moderate	Black oak	70	Shortleaf pine, loblolly pine, Virginia pine.
Weikert	5d	Slight	Moderate	Severe	Slight	Black oak	52	Virginia pine, shortleaf pine, loblolly pine.
						Virginia pine	50	
Wellston	3r	Moderate	Moderate	Moderate	Moderate	Northern red oak	70	Eastern white pine, Virginia pine.
						Yellow-poplar	85	
						Virginia pine	66	
FwF (north aspect):*								
Frondorf	2r	Severe	Severe	Slight	Severe	Black oak	76	Yellow-poplar, shortleaf pine, black walnut, eastern white pine, loblolly pine.
						Virginia pine	78	
						Sweetgum	82	
Weikert	4d	Moderate	Severe	Moderate	Slight	Black oak	65	Eastern white pine, shortleaf pine, Virginia pine.
						Virginia pine	60	
						Yellow-poplar	80	
Wellston	2r	Severe	Severe	Slight	Severe	Northern red oak	75	Eastern white pine, black walnut, yellow-poplar, white ash.
						Yellow-poplar	89	
						Virginia pine	69	
FwF (south aspect):*								
Frondorf	3r	Severe	Severe	Moderate	Moderate	Black oak	70	Shortleaf pine, loblolly pine, Virginia pine.
Weikert	5d	Moderate	Severe	Severe	Slight	Black oak	52	Virginia pine, shortleaf pine, loblolly pine.
						Virginia pine	50	
Wellston	3r	Severe	Severe	Moderate	Moderate	Northern red oak	70	Eastern white pine, Virginia pine.
						Yellow-poplar	85	
						Virginia pine	66	
HaC, HbC3 Hagerstown	1c	Slight	Moderate	Slight	Severe	Northern red oak	85	Black walnut, yellow-poplar, eastern white pine, white ash.
						Yellow-poplar	95	
HcD:*								
Hagerstown	1c	Moderate	Severe	Slight	Severe	Northern red oak	85	Black walnut, yellow-poplar, eastern white pine, white ash.
						Yellow-poplar	95	
Fredonia	3c	Moderate	Moderate	Slight	Moderate	Northern red oak	70	Virginia pine, eastern redcedar.
						Eastern redcedar	50	
HmB Hammack	2o	Slight	Slight	Slight	Severe	Northern red oak	82	Yellow-poplar, black walnut, shortleaf pine, loblolly pine, Virginia pine.
						White oak	82	
						Yellow-poplar	92	
HxC:*								
Hammack	2o	Slight	Slight	Slight	Severe	Northern red oak	82	Yellow-poplar, black walnut, shortleaf pine, loblolly pine, Virginia pine.
						White oak	82	
						Yellow-poplar	92	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
HxC:*								
Baxter	2o	Slight	Slight	Slight	Severe	Northern red oak	77	Eastern white pine, loblolly pine, shortleaf pine, black locust, yellow-poplar, Virginia pine.
						Yellow-poplar	93	
						Virginia pine	64	
HxC3:*								
Hammack	3o	Slight	Slight	Slight	Moderate	Northern red oak	70	Yellow-poplar, black walnut, shortleaf pine, loblolly pine, Virginia pine.
						White oak	70	
						Yellow-poplar	80	
						Shortleaf pine	70	
Baxter	3o	Slight	Slight	Slight	Moderate	Northern red oak	70	Shortleaf pine, loblolly pine, eastern redcedar, Virginia pine.
						Virginia pine	70	
						Eastern redcedar	35	
HxD:*								
Hammack	2r	Moderate	Moderate	Slight	Severe	Northern red oak	82	Yellow-poplar, black locust, shortleaf pine, loblolly pine, Virginia pine.
						White oak	82	
						Yellow-poplar	92	
Baxter	2r	Moderate	Moderate	Slight	Severe	Northern red oak	77	Eastern white pine, loblolly pine, shortleaf pine, black locust, yellow-poplar, Virginia pine.
						Yellow-poplar	93	
						Virginia pine	64	
HxD3:*								
Hammack	3r	Moderate	Moderate	Slight	Moderate	Northern red oak	70	Yellow-poplar, black walnut, shortleaf pine, loblolly pine, Virginia pine.
						White oak	70	
						Yellow-poplar	80	
						Shortleaf pine	70	
Baxter	3r	Moderate	Moderate	Slight	Moderate	Northern red oak	65	Shortleaf pine, loblolly pine, eastern redcedar, Virginia pine.
						Virginia pine	65	
						Eastern redcedar	35	
La Lawrence	2w	Slight	Moderate	Slight	Severe	Black oak	71	Yellow-poplar, white ash, loblolly pine, American sycamore.
						Yellow-poplar	86	
						Sweetgum	87	
LbB, LbC, LcC3 Lax	3o	Slight	Slight	Slight	Moderate	Yellow-poplar	90	Loblolly pine, shortleaf pine, eastern white pine.
						Southern red oak	70	
						Loblolly pine	80	
						Shortleaf pine	70	
LeC, LeC3,* LfD* Lexington	3o	Slight	Slight	Slight	Moderate	Cherrybark oak	80	Cherrybark oak, Shumard oak, loblolly pine, yellow-poplar, sweetgum.
						Southern red oak	70	
						Loblolly pine	80	
						Shortleaf pine	62	
						Sweetgum	89	
						Shagbark hickory	---	
						Yellow-poplar	95	
						Black walnut	---	
						Black cherry	---	
Ln Lindside	1o	Slight	Slight	Slight	Severe	Northern red oak	85	Eastern white pine, yellow-poplar, black walnut, white ash.
						Yellow-poplar	95	
						Black walnut	---	
						White ash	---	
						White oak	85	
						Red maple	---	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	
Me---------- Melvin	1w	Slight	Severe	Severe	Severe	Pin oak----------	98	American sycamore, pin oak, sweetgum, loblolly pine.
Ne---------- Newark	1w	Slight	Moderate	Slight	Severe	Pin oak----------	96	Eastern cottonwood, sweetgum, loblolly pine, American sycamore, eastern white pine, cherrybark oak.
						Eastern cottonwood--	89	
						Sweetgum----------	88	
NhA, NhB, NhC------ Nicholson	2o	Slight	Slight	Slight	Severe	Northern red oak----	74	Black walnut, yellow-poplar, eastern white pine, shortleaf pine, white ash.
						Yellow-poplar-------	107	
						Sweetgum----------	87	
NlC3---------- Nicholson	3o	Slight	Slight	Slight	Moderate	Northern red oak----	70	Shortleaf pine, eastern white pine, black locust, loblolly pine.
No---------- Nolin	1o	Slight	Slight	Slight	Severe	Sweetgum----------	92	Sweetgum, yellow-poplar, eastern white pine, eastern cottonwood, white ash, cherrybark oak.
						Yellow-poplar-------	107	
						Cherrybark oak------	97	
OtA, OtB---------- Otwell	3o	Slight	Slight	Slight	Moderate	White oak----------	72	Eastern white pine, yellow-poplar white ash.
						Yellow-poplar-------	---	
						Sugar maple---------	---	
PcC3:* Pembroke----------	1o	Slight	Slight	Slight	Severe	Northern red oak----	95	Yellow-poplar, black walnut, white ash, eastern white pine, shortleaf pine, loblolly pine.
						Yellow-poplar-------	95	
Crider----------	1o	Slight	Slight	Slight	Severe	Northern red oak----	88	Eastern white pine, yellow-poplar, black walnut, loblolly pine, white ash.
						Yellow-poplar-------	97	
						Virginia pine-------	78	
						Shortleaf pine------	80	
Ro---------- Robertsville	1w	Slight	Severe	Severe	Severe	Pin oak----------	85	Sweetgum, loblolly pine, American sycamore.
						Yellow-poplar-------	93	
						Sweetgum----------	96	
						Shumard oak---------	90	
SaA, SaB---------- Sadler	3o	Slight	Slight	Slight	Moderate	Northern red oak----	70	Eastern white pine, shortleaf pine, yellow-poplar, Virginia pine.
						Yellow-poplar-------	90	
						Virginia pine-------	70	
SgC---------- Saffell	4f	Slight	Slight	Slight	Slight	Shortleaf pine------	60	Loblolly pine, shortleaf pine, eastern redcedar.
						Eastern redcedar----	---	
						White oak----------	---	
SgF---------- Saffell	4f	Moderate	Severe	Slight	Slight	Shortleaf pine------	60	Loblolly pine, shortleaf pine, eastern redcedar, Virginia pine.
						White oak----------	50	
ZaB, ZaC---------- Zanesville	3o	Slight	Slight	Slight	Moderate	Black oak----------	68	Virginia pine, eastern white pine, shortleaf pine, loblolly pine.
						Virginia pine-------	66	
						Yellow-poplar-------	88	

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

TABLE 8.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
BaE,* BaF:*					
Baxter	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Hammack	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
BrC	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
BrD	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
BsC3	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
BsD3	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
BxE:*					
Brandon	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
Saffell	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Cp	Severe: floods.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones, floods.
CrA	Slight	Slight	Slight	Slight	Slight.
Crider					
CrB	Slight	Slight	Moderate: slope.	Slight	Slight.
Crider					
CsC:*					
Crider	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Pembroke	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
ElA	Slight	Slight	Slight	Slight	Slight.
Elk					
ElB	Slight	Slight	Moderate: slope.	Slight	Slight.
Elk					
FdB:*					
Fredonia	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight	Moderate: thin layer.
Pembroke	Slight	Slight	Severe: slope.	Slight	Slight.
FrD:*					
Fredonia	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
Rock outcrop.					

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
FwC:*					
Frondorf	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope, thin layer.
Weikert	Severe: small stones, depth to rock.	Severe: small stones, depth to rock.	Severe: slope, depth to rock, small stones.	Slight	Severe: thin layer, small stones.
Wellston	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
FwD:*					
Frondorf	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Weikert	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope, depth to rock, small stones.	Moderate: slope.	Severe: slope, thin layer, small stones.
Wellston	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
FwF:*					
Frondorf	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Weikert	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope, depth to rock, small stones.	Severe: slope.	Severe: slope, thin layer, small stones.
Wellston	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
HaC, HbC3 Hagerstown	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: large stones, slope.
HcD:*					
Hagerstown	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Fredonia	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
HmB Hammack	Slight	Slight	Moderate: slope.	Slight	Slight.
HxC,* HxC3:*					
Hammack	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Baxter	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, slope.
HxD,* HxD3:*					
Hammack	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Baxter	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
La Lawrence	Severe: floods, wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
LbB Lax	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, small stones, wetness.	Moderate: wetness.	Moderate: wetness.
LbC, LcC3 Lax	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: wetness, slope.
LeC, LeC3* Lexington	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
LfD* Lexington	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
Ln Lindside	Severe: floods.	Slight	Moderate: floods.	Slight	Moderate: floods.
Me Melvin	Severe: floods, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ne Newark	Severe: floods, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: floods, wetness.
NhA Nicholson	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: erodes easily.	Moderate: wetness.
NhB Nicholson	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
NhC, NlC3 Nicholson	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Moderate: wetness.	Moderate: wetness, slope.
No Nolin	Severe: floods.	Slight	Moderate: floods.	Slight	Moderate: floods.
OtA, OtB Otwell	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Severe: erodes easily.	Slight.
PcC3:* Pembroke	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Crider	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Pg,* Pt.* Pits					
Ro Robertsville	Severe: floods, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
SaA Sadler	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
SaB---------- Sadler	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
SgC---------- Saffell	Moderate: small stones, slope.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight----------	Moderate: droughty, slope.
SgF---------- Saffell	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
ZaB---------- Zanesville	Moderate: percs slowly, wetness.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Moderate: wetness.	Slight.
ZaC---------- Zanesville	Moderate: slope, percs slowly, wetness.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.

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

TABLE 9.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
BaE:*										
Baxter	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Hammack	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
BaF:*										
Baxter	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Hammack	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
BrC Brandon	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
BrD Brandon	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
BsC3 Brandon	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
BsD3 Brandon	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
BxE:*										
Brandon	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Saffell	Very poor.	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Cp Clifty	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CrA Crider	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CrB Crider	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CsC:*										
Crider	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Pembroke	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
ElA, ElB Elk	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
FdB:*										
Fredonia	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Pembroke	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
FrD:*										
Fredonia	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
FrD:* Rock outcrop.										
FwC:* Frondorf	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Weikert	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
Wellston	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
FwD:* Frondorf	Poor	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Weikert	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
Wellston	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
FwF:* Frondorf	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Weikert	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
Wellston	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
HaC, HbC3 Hagerstown	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
HcD:* Hagerstown	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Fredonia	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
HmB Hammack	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
HxC,* HxC3:* Hammack	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Baxter	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
HxD,* HxD3:* Hammack	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Baxter	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
La Lawrence	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
LbB Lax	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
LbC, LcC3---------- Lax	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LeC, LeC3*---------- Lexington	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
LfD*---------- Lexington	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Ln---------- Lindside	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Me---------- Melvin	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Ne---------- Newark	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.
NhA---------- Nicholson	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
NhB---------- Nicholson	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
NhC, NlC3---------- Nicholson	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
No---------- Nolin	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
OtA, OtB---------- Otwell	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
PcC3:* Pembroke----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Crider----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Pg,* Pt.* Pits										
Ro---------- Robertsville	Poor	Poor	Fair	Fair	Fair	Good	Good	Poor	Fair	Good.
SaA---------- Sadler	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
SaB---------- Sadler	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
SgC---------- Saffell	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
SgF---------- Saffell	Very poor.	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
ZaB---------- Zanesville	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
ZaC---------- Zanesville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

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

TABLE 10.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
BaE,* BaF:*						
Baxter	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Hammack	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
BrC	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
BrD	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
BsC3	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
BsD3	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
BxE:*						
Brandon	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Saffell	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Cp	Moderate: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: small stones, floods.
CrA	Moderate: too clayey.	Slight	Slight	Slight	Severe: low strength.	Slight.
CrB	Moderate: too clayey.	Slight	Slight	Moderate: slope.	Severe: low strength.	Slight.
CsC:*						
Crider	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
Pembroke	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
ElA	Slight	Slight	Slight	Slight	Severe: low strength.	Slight.
Elk						
ElB	Slight	Slight	Slight	Moderate: slope.	Severe: low strength.	Slight.
Elk						
FdB:*						
Fredonia	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: low strength.	Moderate: thin layer.
Pembroke	Moderate: too clayey.	Slight	Moderate: shrink-swell.	Moderate: slope.	Severe: low strength.	Slight.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
FrD:*						
Fredonia	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Rock outcrop.						
FwC:*						
Frondorf	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope.	Moderate: slope, thin layer.
Weikert	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Moderate: slope, depth to rock.	Severe: thin layer, small stones.
Wellston	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
FwD,* FwF:*						
Frondorf	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Weikert	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: slope, thin layer, small stones.
Wellston	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
HaC, HbC3 Hagerstown	Moderate: depth to rock, too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: large stones, slope.
HcD:*						
Hagerstown	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Fredonia	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
HmB Hammack	Moderate: too clayey.	Slight	Moderate: shrink-swell.	Moderate: slope.	Severe: low strength.	Slight.
HxC,* HxC3:*						
Hammack	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
Baxter	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: small stones, slope.
HxD,* HxD3:*						
Hammack	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Baxter	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
La---------- Lawrence	Severe: wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: low strength.	Moderate: wetness.
LbB---------- Lax	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: low strength.	Moderate: wetness.
LbC, LcC3--------- Lax	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Severe: low strength.	Moderate: wetness, slope.
LeC, LeC3*-------- Lexington	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
LfD*---------- Lexington	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Ln---------- Lindside	Severe: floods, wetness.	Severe: floods.	Severe: floods, wetness.	Severe: floods.	Severe: floods.	Moderate: floods.
Me---------- Melvin	Severe: wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: low strength, wetness, floods.	Severe: wetness.
Ne---------- Newark	Severe: wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: low strength, wetness, floods.	Moderate: wetness, floods.
NhA---------- Nicholson	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: low strength.	Moderate: wetness.
NhB---------- Nicholson	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: low strength.	Moderate: wetness.
NhC, NlC3--------- Nicholson	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Severe: low strength.	Moderate: wetness, slope.
No---------- Nolin	Moderate: wetness, floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: low strength, floods.	Moderate: floods.
OtA---------- Otwell	Severe: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
OtB---------- Otwell	Severe: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
PcC3:* Pembroke---------	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
Crider----------	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
Pg,* Pt.* Pits						

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Ro---------- Robertsville	Severe: wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: low strength, wetness, floods.	Severe: wetness.
SaA---------- Sadler	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: low strength, wetness.	Moderate: wetness.
SaB---------- Sadler	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: low strength, wetness.	Moderate: wetness.
SgC---------- Saffell	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
SgF---------- Saffell	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
ZaB---------- Zanesville	Moderate: depth to rock, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: slope, wetness.	Severe: low strength.	Slight.
ZaC---------- Zanesville	Moderate: slope, wetness, depth to rock.	Moderate: slope, wetness.	Severe: wetness.	Severe: slope.	Severe: low strength.	Moderate: slope.

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

TABLE 11.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
BaE,* BaF:*					
Baxter	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack.
Hammack	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
BrC	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: small stones.
BrD	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope.
BsC3	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: small stones.
BsD3	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope.
BxE:*					
Brandon	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope.
Saffell	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: slope.	Poor: small stones, slope.
Cp	Severe: floods, poor filter.	Severe: seepage, floods.	Severe: floods, seepage.	Severe: floods, seepage.	Poor: small stones.
CrA	Slight	Moderate: seepage.	Moderate: too clayey.	Slight	Fair: too clayey.
CrB	Slight	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
CsC:*					
Crider	Moderate: slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
Pembroke	Moderate: slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
ElA	Slight	Moderate: seepage.	Moderate: too clayey.	Slight	Fair: too clayey.
ElB	Slight	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
FdB:*					
Fredonia	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
Pembroke	Slight	Severe: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
FrD:*					
Fredonia	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: area reclaim, too clayey, hard to pack.
Rock outcrop.					
FwC:*					
Frondorf	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, small stones.
Weikert	Severe: depth to rock.	Severe: slope, depth to rock, seepage.	Severe: depth to rock, seepage.	Severe: seepage, depth to rock.	Poor: area reclaim, seepage, small stones.
Wellston	Moderate: depth to rock, percs slowly, slope.	Severe: slope.	Severe: depth to rock.	Moderate: depth to rock, slope.	Fair: area reclaim, small stones, slope.
FwD,* FwF:*					
Frondorf	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, small stones, slope.
Weikert	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage, depth to rock.	Poor: slope, area reclaim, seepage.
Wellston	Severe: slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: slope.
HaC, HbC3 Hagerstown	Moderate: depth to rock, percs slowly, slope.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock, slope.	Poor: too clayey, hard to pack.
HcD:*					
Hagerstown	Severe: slope.	Severe: slope.	Severe: depth to rock, slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
Fredonia	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: area reclaim, too clayey, hard to pack.
HmB Hammack	Slight	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, thin layer.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
HxC,* HxC3:* Hammack	Moderate: slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope, thin layer.
Baxter	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
HxD,* HxD3:* Hammack	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Baxter	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack.
La Lawrence	Severe: wetness, percs slowly.	Severe: floods, wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
LbB Lax	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: seepage, wetness.	Moderate: wetness.	Fair: small stones, wetness.
LbC, LcC3 Lax	Severe: wetness, percs slowly.	Severe: seepage, slope, wetness.	Severe: seepage, wetness.	Moderate: wetness, slope.	Fair: small stones, wetness.
LeC, LeC3* Lexington	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: too clayey, slope.
LfD* Lexington	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Ln Lindside	Severe: floods, wetness, percs slowly.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Good.
Me Melvin	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Poor: wetness.
Ne Newark	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Poor: wetness.
NhA, NhB Nicholson	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
NhC, NlC3 Nicholson	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness, too clayey.	Moderate: wetness, slope.	Poor: too clayey, hard to pack.
No Nolin	Severe: floods.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Fair: too clayey.
OtA Otwell	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
OtB---------- Otwell	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.
PcC3:* Pembroke----------	Moderate: slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
Crider----------	Moderate: slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
Pg,* Pt.* Pits					
Ro---------- Robertsville	Severe: floods, wetness, percs slowly.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Poor: wetness.
SaA, SaB---------- Sadler	Severe: wetness, percs slowly.	Severe: wetness.	Severe: depth to rock, wetness.	Moderate: depth to rock, wetness.	Fair: area reclaim, too clayey, small stones.
SgC---------- Saffell	Moderate: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage.	Moderate: slope.	Poor: small stones.
SgF---------- Saffell	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: slope.	Poor: small stones, slope.
ZaB---------- Zanesville	Severe: percs slowly, wetness.	Severe: wetness.	Severe: depth to rock.	Moderate: depth to rock, wetness.	Fair: too clayey, area reclaim.
ZaC---------- Zanesville	Severe: percs slowly, wetness.	Severe: slope, wetness.	Severe: depth to rock.	Moderate: depth to rock, slope, wetness.	Fair: slope, too clayey, area reclaim.

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

TABLE 12.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," "probable," and "improbable." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
BaE,* BaF:*				
Baxter	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Hammack	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
BrC	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
Brandon				
BrD	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope.
Brandon				
BsC3	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
Brandon				
BsD3	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope.
Brandon				
BxE:*				
Brandon	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope.
Saffell	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Cp	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
Clifty				
CrA, CrB	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Crider				
CsC:*				
Crider	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
Pembroke	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
ElA, ElB	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Elk				
FdB:*				
Fredonia	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Pembroke	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
FrD:*				
Fredonia	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Rock outcrop.				
FwC:*				
Frondorf	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Weikert	Poor: area reclaim.	Improbable: small stones.	Improbable: thin layer.	Poor: small stones, area reclaim.
Wellston	Fair: area reclaim, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
FwD:*				
Frondorf	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Weikert	Poor: area reclaim.	Improbable: small stones.	Improbable: thin layer.	Poor: slope, small stones, area reclaim.
Wellston	Fair: area reclaim, thin layer, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
FwF:*				
Frondorf	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Weikert	Poor: slope, area reclaim.	Improbable: small stones.	Improbable: thin layer.	Poor: slope, small stones, area reclaim.
Wellston	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
HaC, HbC3 Hagerstown	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
HcD:*				
Hagerstown	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Fredonia	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
HmB Hammack	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
HxC,* HxC3:*				
Hammack	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
HxC,* HxC3:* Baxter	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
HxD,* HxD3:* Hammack	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Baxter	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
La Lawrence	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
LbB, LbC, LcC3 Lax	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
LeC, LeC3* Lexington	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
LfD* Lexington	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Ln Lindside	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Me Melvin	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Ne Newark	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
NhA, NhB Nicholson	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
NhC, NlC3 Nicholson	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
No Nolin	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
OtA, OtB Otwell	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
PcC3:* Pembroke	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Crider	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
Pg,* Pt.* Pits				
Ro Robertsville	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
SaA, SaB---------- Sadler	Fair: area reclaim, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim.
SgC---------- Saffell	Good----------	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
SgF---------- Saffell	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
ZaB, ZaC---------- Zanesville	Fair: area reclaim, thin layer, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.

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

TABLE 13.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated]

Map symbol and soil name	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Terraces and diversions	Grassed waterways
BaE,* BaF:*					
Baxter	Severe: slope.	Moderate: hard to pack.	Deep to water	Slope	Slope.
Hammack	Severe: slope.	Severe: piping.	Deep to water	Slope, large stones.	Slope.
BrC, BrD, BsC3, BsD3 Brandon	Severe: seepage.	Severe: seepage.	Deep to water	Slope, erodes easily.	Slope, erodes easily.
BxE:*					
Brandon	Severe: seepage, slope.	Severe: seepage.	Deep to water	Slope, erodes easily.	Slope, erodes easily.
Saffell	Severe: slope.	Slight	Deep to water	Slope	Slope, droughty.
Cp Clifty	Severe: seepage.	Severe: piping.	Deep to water	Favorable	Favorable.
CrA Crider	Moderate: seepage.	Severe: piping.	Deep to water	Favorable	Favorable.
CrB Crider	Moderate: seepage.	Severe: piping.	Deep to water	Favorable	Favorable.
CsC:*					
Crider	Moderate: seepage.	Severe: piping.	Deep to water	Slope	Slope.
Pembroke	Moderate: seepage.	Moderate: hard to pack.	Deep to water	Slope	Slope.
ElA Elk	Moderate: seepage.	Severe: piping.	Deep to water	Favorable	Favorable.
ElB Elk	Moderate: seepage.	Severe: piping.	Deep to water	Favorable	Favorable.
FdB:*					
Fredonia	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Depth to rock, erodes easily.	Erodes easily, depth to rock.
Pembroke	Moderate: seepage, slope.	Moderate: hard to pack.	Deep to water	Favorable	Favorable.
FrD:*					
Fredonia	Moderate: depth to rock.	Severe: thin layer, hard to pack.	Deep to water	Slope, depth to rock, erodes easily.	Slope, depth to rock, erodes easily.
Rock outcrop.					
FwC,* FwD,* FwF:*					
Frondorf	Severe: slope.	Severe: piping.	Deep to water	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Terraces and diversions	Grassed waterways
FwC,* FwD,* FwF:* Weikert	Severe: depth to rock, slope, seepage.	Severe: seepage, thin layer.	Deep to water	Slope, depth to rock.	Slope, droughty.
Wellston	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.
HaC, HbC3 Hagerstown	Moderate: seepage.	Severe: hard to pack.	Deep to water	Slope	Slope.
HcD:* Hagerstown	Moderate: seepage.	Severe: hard to pack.	Deep to water	Slope	Slope.
Fredonia	Moderate: seepage, depth to rock.	Severe: thin layer, hard to pack.	Deep to water	Slope, depth to rock, erodes easily.	Slope, depth to rock, erodes easily.
HmB Hammack	Moderate: seepage.	Severe: piping.	Deep to water	Large stones	Favorable.
HxC,* HxC3,* HxD,* HxD3:* Hammack	Moderate: seepage.	Severe: piping.	Deep to water	Slope, large stones.	Slope.
Baxter	Moderate: seepage.	Moderate: hard to pack.	Deep to water	Slope	Slope.
La Lawrence	Slight	Severe: piping.	Percs slowly	Erodes easily, wetness, rooting depth.	Wetness, erodes easily, rooting depth.
LbB Lax	Moderate: seepage.	Moderate: wetness.	Percs slowly, slope.	Erodes easily, wetness.	Erodes easily, rooting depth.
LbC, LcC3 Lax	Moderate: seepage.	Moderate: wetness.	Percs slowly, slope.	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.
LeC, LeC3,* LfD* Lexington	Severe: seepage.	Severe: thin layer.	Deep to water	Slope, erodes easily.	Slope, erodes easily.
Ln Lindside	Moderate: seepage.	Severe: piping, wetness.	Floods	Erodes easily	Erodes easily.
Me Melvin	Moderate: seepage.	Severe: piping, wetness.	Floods	Erodes easily, wetness.	Wetness, erodes easily.
Ne Newark	Moderate: seepage.	Severe: piping, wetness.	Floods	Erodes easily, wetness.	Wetness, erodes easily.
NhA Nicholson	Slight	Moderate: hard to pack, wetness.	Percs slowly	Erodes easily, wetness.	Erodes easily, rooting depth.
NhB Nicholson	Slight	Moderate: hard to pack, wetness.	Percs slowly, slope.	Erodes easily, wetness.	Erodes easily, rooting depth.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for--		Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Terraces and diversions	Grassed waterways
NhC, NlC3--------- Nicholson	Slight----------	Moderate: hard to pack, wetness.	Percs slowly, slope.	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.
No---------- Nolin	Severe: seepage.	Severe: piping.	Deep to water----	Erodes easily----	Erodes easily.
OtA---------- Otwell	Slight----------	Moderate: piping.	Percs slowly-----	Erodes easily, rooting depth.	Erodes easily, rooting depth.
OtB---------- Otwell	Slight----------	Moderate: piping.	Percs slowly-----	Erodes easily, rooting depth.	Erodes easily, rooting depth.
PcC3:* Pembroke--------- Crider----------	Moderate: seepage. Moderate: seepage.	Moderate: hard to pack. Severe: piping.	Deep to water---- Deep to water----	Slope---------- Slope----------	Slope. Slope.
Pg,* Pt.* Pits					
Ro---------- Robertsville	Moderate: seepage.	Severe: piping, wetness.	Percs slowly, floods.	Erodes easily, wetness, rooting depth.	Wetness, erodes easily, rooting depth.
SaA---------- Sadler	Moderate: seepage, depth to rock.	Severe: piping.	Percs slowly-----	Erodes easily, wetness.	Erodes easily, rooting depth.
SaB---------- Sadler	Moderate: seepage, depth to rock.	Severe: piping.	Percs slowly, slope.	Erodes easily, wetness.	Erodes easily, rooting depth.
SgC, SgF--------- Saffell	Severe: slope.	Slight----------	Deep to water----	Slope----------	Slope, droughty.
ZaB---------- Zanesville	Moderate: seepage, depth to rock.	Severe: piping.	Percs slowly, slope.	Erodes easily, wetness.	Erodes easily, rooting depth.
ZaC---------- Zanesville	Moderate: seepage, depth to rock.	Severe: piping.	Percs slowly, slope.	Slope, erodes easily, wetness.	Slope, erodes easily, wetness.

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

TABLE 14.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Map symbol and soil name	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
BaE,* BaF:* Baxter	0-10	Cherty silt loam	ML, GM, CL-ML, GM-GC	A-4	0-10	60-90	55-80	45-70	45-70	25-35	4-10
	10-18	Cherty silty clay loam, cherty silt loam, silty clay loam.	CL, SM-SC, GC, CL-ML	A-4, A-6	0-10	60-90	55-80	55-80	45-80	25-40	5-20
	18-95	Cherty silty clay, cherty clay, very cherty clay.	CH, CL, GC, SC	A-7	0-20	55-90	45-85	45-85	45-80	40-60	20-38
Hammack	0-6	Silt loam	ML, CL, CL-ML	A-4	0	100	95-100	90-100	85-100	25-35	4-10
	6-25	Silt loam, silty clay loam.	ML, CL	A-6, A-7, A-4	0	100	95-100	90-100	85-95	30-45	6-20
	25-30	Very cherty silt loam, very cherty silty clay loam.	GM, GC, ML, CL	A-6, A-7, A-4, A-2	15-35	25-80	22-75	22-75	18-70	30-45	6-20
	30-94	Very cherty silty clay, very cherty clay, cherty clay.	GC, CL, CH, SC	A-7, A-2-7	10-40	40-75	30-75	30-70	25-70	45-70	20-40
BrC, BrD Brandon	0-8	Silt loam	ML, CL, CL-ML	A-4	0	100	95-100	90-100	85-100	<30	NP-10
	8-28	Silty clay loam, silt loam.	CL, ML, CL-ML	A-4, A-6	0	95-100	90-100	85-100	75-100	25-40	3-15
	28-72	Very gravelly fine sandy loam, very gravelly silt loam, gravelly clay loam.	GM, GC, GM-GC, SM-SC	A-2, A-4, A-1	0-5	30-70	20-60	15-55	10-50	<30	NP-10
BsC3, BsD3 Brandon	0-4	Silty clay loam	ML, CL, CL-ML	A-4, A-6	0	95-100	95-100	90-100	85-100	25-40	3-15
	4-24	Silty clay loam, silt loam.	CL, ML, CL-ML	A-4, A-6	0	95-100	90-100	85-100	75-100	25-40	3-15
	24-72	Very gravelly fine sandy loam, very gravelly silt loam, gravelly clay loam.	GM, GC, GM-GC, SM-SC	A-2, A-4, A-1	0-5	30-70	20-60	15-55	10-50	<30	NP-10
BxE:* Brandon	0-8	Silt loam	ML, CL, CL-ML	A-4	0	100	95-100	90-100	85-100	<30	NP-10
	8-28	Silty clay loam, silt loam.	CL, ML, CL-ML	A-4, A-6	0	95-100	90-100	85-100	75-100	25-40	3-15
	28-72	Very gravelly fine sandy loam, very gravelly silt loam, gravelly clay loam.	GM, GC, GM-GC, SM-SC	A-2, A-4, A-1	0-5	30-70	20-60	15-55	10-50	<30	NP-10

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
BxE:*											
Saffell	0-6	Gravelly silt loam.	SM	A-2, A-4	0-5	75-85	55-80	45-70	30-45	<20	NP-3
	6-15	Gravelly fine sandy loam, gravelly sandy clay loam, gravelly loam.	GC, SC, SM-SC, GM-GC	A-2, A-1	0-15	35-85	25-70	20-55	15-35	20-40	4-18
	15-70	Very gravelly sandy clay loam, very gravelly fine sandy loam, very gravelly loam.	GC, SC, SM-SC, GM-GC	A-2, A-1	0-15	35-85	25-65	20-55	15-35	20-40	4-18
Cp	0-6	Gravelly silt loam.	ML, CL-ML, GM, GM-GC	A-4	0-10	65-85	60-80	55-75	45-70	20-35	2-10
Clifty	6-34	Gravelly silt loam, gravelly loam, gravelly sandy clay loam.	ML, CL-ML, GM, GM-GC	A-4	0-15	55-75	50-70	45-65	35-60	20-35	2-10
	34-60	Gravelly silt loam, very gravelly loam, gravelly sandy loam.	GM, GM-GC, SM	A-2, A-4, A-1	0-25	40-75	35-70	25-60	15-50	<30	NP-7
CrA, CrB	0-8	Silt loam	ML, CL, CL-ML	A-4, A-6	0	100	95-100	90-100	85-100	25-35	4-12
Crider	8-40	Silt loam, silty clay loam.	CL, ML, CL-ML	A-7, A-6, A-4	0	100	95-100	90-100	85-100	25-42	4-20
	40-66	Silty clay, clay, silty clay loam.	CL, CH	A-7, A-6	0-5	85-100	75-100	70-100	60-100	35-65	15-40
CsC:*											
Crider	0-8	Silt loam	ML, CL, CL-ML	A-4, A-6	0	100	95-100	90-100	85-100	25-35	4-12
	8-40	Silt loam, silty clay loam.	CL, ML, CL-ML	A-7, A-6, A-4	0	100	95-100	90-100	85-100	25-42	4-20
	40-66	Silty clay, clay, silty clay loam.	CL, CH	A-7, A-6	0-5	85-100	75-100	70-100	60-100	35-65	15-40
Pembroke	0-6	Silt loam	ML, CL, CL-ML	A-4, A-6	0	95-100	90-100	80-100	70-100	25-40	3-16
	6-34	Silty clay loam	CL	A-6, A-7	0	95-100	90-100	85-100	75-100	30-45	11-25
	34-46	Silty clay loam, silty clay.	CH, CL	A-7, A-6	0	90-100	75-100	75-100	65-100	35-65	20-45
	46-75	Silty clay, clay	CH, CL	A-7	0	85-100	75-100	70-100	60-95	45-70	20-45
ElA, ElB	0-10	Silt loam	ML, CL, CL-ML	A-4	0	95-100	95-100	85-100	70-95	25-35	3-10
Elk	10-44	Silty clay loam, silt loam.	ML, CL, CL-ML	A-4, A-6	0	95-100	90-100	85-100	75-100	25-40	5-15
	44-60	Silty clay loam, silt loam, clay loam.	ML, CL, CL-ML, SM-SC	A-4, A-6	0	75-100	50-100	45-100	40-95	25-40	5-15
FdB:*											
Fredonia	0-9	Silt loam	CL	A-6, A-4	0-5	95-100	90-100	85-100	75-100	25-40	8-20
	9-30	Silty clay, clay, silty clay loam.	CH, MH, CL	A-7	0-5	95-100	90-100	85-100	80-100	45-75	20-45
	30	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Pembroke	0-6	Silt loam	ML, CL, CL-ML	A-4, A-6	0	95-100	90-100	80-100	70-100	25-40	3-16
	6-34	Silty clay loam	CL	A-6, A-7	0	95-100	90-100	85-100	75-100	30-45	11-25
	34-46	Silty clay loam, silty clay.	CH, CL	A-7, A-6	0	90-100	75-100	75-100	65-100	35-65	20-45
	46-75	Silty clay, clay	CH, CL	A-7	0	85-100	75-100	70-100	60-95	45-70	20-45

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
FrD:*											
Fredonia	0-6	Silt loam	CL	A-4, A-6	0-5	95-100	90-100	85-100	75-100	25-40	8-20
	6-34	Silty clay, clay, silty clay loam.	CH, CL, MH	A-7	0-5	95-100	90-100	85-100	80-100	45-75	20-45
	34	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
FwC,* FwD,* FwF:*											
Frondorf	0-5	Silt loam	ML, CL, CL-ML	A-4	0-5	90-100	90-100	85-100	75-100	25-35	5-10
	5-21	Silty clay loam, silt loam.	CL, ML	A-4, A-6, A-7	0-5	90-100	90-100	85-100	75-100	25-45	5-22
	21-29	Channery silty clay loam, channery silt loam, channery loam.	ML, CL, GM, GC	A-4, A-6, A-2, A-7	10-40	55-90	50-85	40-80	30-75	<45	NP-25
	29	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Weikert	0-5	Channery silt loam.	GM, ML, SM	A-1, A-2, A-4	0-10	35-70	35-70	25-65	20-55	30-40	4-10
	5-19	Channery silt loam, channery loam.	GM, GP-GM	A-1, A-2	0-20	15-60	10-55	5-45	5-35	28-36	3-9
	19	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Wellston	0-5	Silt loam	ML	A-4	0	95-100	90-100	85-100	70-95	25-35	3-10
	5-46	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-4	0-5	75-100	70-100	60-95	60-90	25-40	5-20
	46-54	Silt loam, clay loam, gravelly loam.	CL-ML, CL, SC, SM-SC	A-4, A-6	0-10	65-90	65-90	60-90	40-65	20-35	5-15
	54	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
HaC	0-8	Silt loam	CL, CL-ML	A-4, A-6, A-7	0-15	85-100	80-100	80-100	70-95	25-50	5-25
Hagerstown	8-48	Clay, silty clay, silty clay loam.	CH, CL	A-7, A-6	0-5	85-100	80-100	75-100	75-95	30-70	15-40
	48	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
HbC3	0-5	Silty clay loam	CL, CL-ML	A-4, A-6, A-7	0-15	85-100	80-100	80-100	70-95	25-50	5-25
Hagerstown	5-44	Clay, silty clay, silty clay loam.	CH, CL	A-7, A-6	0-5	85-100	80-100	75-100	75-95	30-70	15-40
	44	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
HcD:*											
Hagerstown	0-8	Silt loam	CL, CL-ML	A-4, A-6, A-7	0-15	85-100	80-100	80-100	70-95	25-50	5-25
	8-48	Clay, silty clay, silty clay loam.	CH, CL	A-7, A-6	0-5	85-100	80-100	75-100	75-95	30-70	15-40
	48	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Fredonia	0-6	Silt loam	CL, CL-ML	A-4, A-6	0-5	95-100	90-100	85-100	75-100	25-40	8-20
	6-34	Silty clay, clay, silty clay loam.	CH, CL, MH	A-7	0-5	95-100	90-100	85-100	75-100	45-75	20-45
	34	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
HmB---------- Hammack	0-6	Silt loam--------	ML, CL, CL-ML	A-4	0	100	95-100	90-100	85-100	25-35	4-10
	6-25	Silt loam, silty clay loam.	ML, CL	A-6, A-7, A-4	0	100	95-100	90-100	85-95	30-45	6-20
	25-30	Very cherty silt loam, very cherty silty clay loam.	GM, GC, ML, CL	A-6, A-7, A-4, A-2	15-35	25-80	22-75	22-75	18-70	30-45	6-20
	30-94	Very cherty silty clay, very cherty clay, cherty clay.	GC, CL, CH, SC	A-7, A-2-7	10-40	40-75	30-75	30-70	25-70	45-70	20-40
HxC:*											
Hammack---------	0-6	Silt loam--------	ML, CL, CL-ML	A-4	0	100	95-100	90-100	85-100	25-35	4-10
	6-25	Silt loam, silty clay loam.	ML, CL	A-6, A-7, A-4	0	100	95-100	90-100	85-95	30-45	6-20
	25-30	Very cherty silt loam, very cherty silty clay loam.	GM, GC, ML, CL	A-6, A-7, A-4, A-2	15-35	25-80	22-75	22-75	18-70	30-45	6-20
	30-94	Very cherty silty clay, very cherty clay, cherty clay.	GC, CL, CH, SC	A-7, A-2-7	10-40	40-75	30-75	30-70	25-70	45-70	20-40
Baxter----------	0-10	Cherty silt loam	ML, GM, CL-ML, GM-GC	A-4	0-10	60-90	55-80	45-70	45-70	25-35	4-10
	10-18	Cherty silty clay loam, silty clay loam.	CL, SM-SC, GC, CL-ML	A-4, A-6	0-10	60-90	55-80	55-80	45-80	25-40	5-20
	18-95	Cherty silty clay, cherty clay.	CH, CL, GC, SC	A-7	0-20	55-90	45-85	45-85	45-80	40-60	20-38
HxC3:*											
Hammack---------	0-5	Silty clay loam	CL	A-6, A-7	0	100	95-100	90-100	85-100	34-45	15-20
	5-21	Silt loam, silty clay loam.	ML, CL	A-6, A-7, A-4	0	100	95-100	90-100	85-95	30-45	6-20
	21-26	Very cherty silt loam, very cherty silty clay loam.	GM, GC, ML, CL	A-6, A-7, A-4, A-2	15-35	25-80	22-75	22-75	18-70	30-45	6-20
	26-94	Very cherty silty clay, very cherty clay, cherty clay.	GC, CL, CH, SC	A-7, A-2-7	10-40	40-75	30-75	30-70	25-70	45-70	20-40
Baxter----------	0-6	Cherty silty clay loam.	CL	A-6	0-10	60-85	55-75	55-75	55-75	30-40	15-22
	6-14	Cherty silty clay loam, silty clay loam.	CL, SM-SC, GC, CL-ML	A-4, A-6	0-10	60-90	55-80	55-80	45-80	25-40	5-20
	14-95	Cherty silty clay, cherty clay.	CH, CL, GC, SC	A-7	0-20	55-90	45-85	45-85	45-80	40-60	20-38

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
HxD:*											
Hammack	0-6	Silt loam	ML, CL, CL-ML	A-4	0	100	95-100	90-100	85-100	25-35	4-10
	6-25	Silt loam, silty clay loam.	ML, CL	A-6, A-7, A-4	0	100	95-100	90-100	85-95	30-45	6-20
	25-30	Very cherty silt loam, very cherty silty clay loam.	GM, GC, ML, CL	A-6, A-7, A-4, A-2	15-35	25-80	22-75	22-75	18-70	30-45	6-20
	30-94	Very cherty silty clay, very cherty clay, cherty clay.	GC, CL, CH, SC	A-7, A-2-7	10-40	40-75	30-75	30-70	25-70	45-70	20-40
Baxter	0-10	Cherty silt loam	ML, GM, CL-ML, GM-GC	A-4	0-10	60-90	55-80	45-70	45-70	25-35	4-10
	10-18	Cherty silty clay loam, silty clay loam.	CL, SM-SC, GC, CL-ML	A-4, A-6	0-10	60-90	55-80	55-80	45-80	25-40	5-20
	18-95	Cherty silty clay, cherty clay.	CH, CL, GC, SC	A-7	0-20	55-90	45-85	45-85	45-80	40-60	20-38
HxD3:*											
Hammack	0-5	Silty clay loam	CL	A-6, A-7	0	100	95-100	90-100	85-100	34-45	15-20
	5-21	Silt loam, silty clay loam.	ML, CL	A-6, A-7, A-4	0	100	95-100	90-100	85-95	30-45	6-20
	21-26	Very cherty silt loam, very cherty silty clay loam.	GM, GC, ML, CL	A-6, A-7, A-4, A-2	15-35	25-80	22-75	22-75	18-70	30-45	6-20
	26-94	Very cherty silty clay, very cherty clay, cherty clay.	GC, CL, CH, SC	A-7, A-2-7	10-40	40-75	30-75	30-70	25-70	45-70	20-40
Baxter	0-6	Cherty silty clay loam.	CL	A-6	0-10	60-85	55-75	55-75	55-75	30-40	15-22
	6-14	Cherty silty clay loam, silty clay loam.	CL, SM-SC, GC, CL-ML	A-4, A-6	0-10	60-90	55-80	55-80	45-80	25-40	5-20
	14-95	Cherty silty clay, cherty clay, very cherty clay.	CH, CL, GC, SC	A-7	0-20	55-90	45-85	45-85	45-80	40-60	20-38
La Lawrence	0-8	Silt loam	ML, CL, CL-ML	A-4	0	100	95-100	90-100	80-100	25-35	2-10
	8-23	Silty clay loam, silt loam.	ML, CL, CL-ML	A-4, A-6, A-7	0	100	95-100	90-100	80-100	25-42	5-20
	23-43	Silty clay loam, silt loam.	ML, CL, CL-ML	A-4, A-6, A-7	0	100	95-100	90-100	80-100	25-42	5-20
	43-60	Silty clay, silty clay loam, silt loam.	ML, CL, MH, CL-ML	A-4, A-6, A-7	0	95-100	90-100	85-100	75-100	25-60	5-25

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
LbB, LbC---------- Lax	0-7	Silt loam--------	ML, CL-ML, CL	A-4	0	80-100	75-100	70-95	55-85	15-30	3-10
	7-24	Silt loam, silty clay loam.	CL, ML	A-4, A-6	0	80-100	75-100	70-95	60-95	25-40	8-16
	24-39	Gravelly silt loam, gravelly silty clay loam, silt loam.	CL, GC, SC	A-6, A-2, A-4	0-5	55-100	50-100	45-95	30-95	25-40	8-18
	39-49	Gravelly silty clay loam, very gravelly silt loam, cherty clay loam.	GC	A-2	0-20	30-50	25-50	20-45	15-30	25-40	8-18
	49-72	Very gravelly clay, gravelly clay loam, very gravelly silty clay loam.	CL, CH, GC, SC	A-2, A-6, A-7	0-20	30-75	25-75	20-70	15-60	35-55	15-30
LcC3---------- Lax	0-3	Silty clay loam	CL, ML	A-4, A-6, A-7	0	85-100	85-100	75-95	65-95	28-45	8-20
	3-21	Silt loam, silty clay loam.	CL, ML	A-4, A-6	0	80-100	75-100	70-95	60-95	25-40	8-16
	21-35	Gravelly silt loam, gravelly silty clay loam, silt loam.	CL, GC, SC	A-6, A-2, A-4	0-5	55-100	50-100	45-95	30-95	25-40	8-18
	35-45	Gravelly silty clay loam, very gravelly silt loam, cherty clay loam.	GC	A-2	0-20	30-50	25-50	20-45	15-30	25-40	8-18
	45-72	Very gravelly clay, gravelly clay loam, very gravelly silty clay loam.	CL, CH, GC, SC	A-2, A-6, A-7	0-20	30-75	25-75	20-70	15-60	35-55	15-30
LeC---------- Lexington	0-10	Silt loam--------	ML, CL, CL-ML	A-4, A-6, A-7	0	100	95-100	90-100	70-95	25-42	5-16
	10-31	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	95-100	90-100	75-95	27-45	11-25
	31-42	Sandy loam, loam, sandy clay loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0	100	95-100	50-85	20-65	22-35	5-15
	42-74	Loamy sand, sandy loam, clay loam.	SC, SM-SC	A-2, A-4, A-6	0	100	95-100	50-70	20-40	22-35	5-15
LeC3*---------- Lexington	0-5	Silt loam--------	ML, CL, CL-ML	A-4, A-6, A-7	0	100	95-100	90-100	70-95	25-42	5-16
	5-26	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	95-100	90-100	75-95	27-45	11-25
	26-37	Sandy loam, loam, sandy clay loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0	100	95-100	50-85	20-65	22-35	5-15
	37-74	Loamy sand, sandy loam, clay loam.	SC, SM-SC	A-2, A-4, A-6	0	100	95-100	50-70	20-40	22-35	5-15
LfD*---------- Lexington	0-10	Silt loam--------	ML, CL, CL-ML	A-4, A-6, A-7	0	100	95-100	90-100	70-95	25-42	5-16
	10-31	Silty clay loam, silt loam.	CL	A-6, A-7	0	100	95-100	90-100	75-95	27-45	11-25
	31-42	Sandy loam, loam, sandy clay loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0	100	95-100	50-85	20-65	22-35	5-15
	42-74	Loamy sand, sandy loam, clay loam.	SC, SM-SC	A-2, A-4, A-6	0	100	95-100	50-70	20-40	22-35	5-15

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Ln---------- Lindside	0-7	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	100	95-100	80-100	55-90	25-40	2-15
	7-47	Silty clay loam, silt loam, very fine sandy loam.	CL, ML	A-4, A-6	0	100	95-100	80-100	55-95	25-40	2-20
	47-60	Silty clay loam, silt loam.	CL, ML, SC	A-4, A-6	0	60-100	55-100	50-100	40-95	20-40	1-25
Me---------- Melvin	0-8	Silt loam--------	CL, CL-ML, ML	A-4	0	95-100	90-100	80-100	80-95	25-35	4-10
	8-60	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	95-100	90-100	80-100	80-95	25-40	5-20
Ne---------- Newark	0-7	Silt loam--------	ML, CL, CL-ML	A-4	0	95-100	90-100	80-100	55-95	<32	NP-10
	7-35	Silt loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6, A-7	0	95-100	90-100	85-100	70-95	22-42	3-20
	35-60	Silt loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6, A-7	0-3	75-100	70-100	65-100	55-95	22-42	3-20
NhA, NhB, NhC---- Nicholson	0-8	Silt loam--------	ML, CL, CL-ML	A-4	0	95-100	95-100	85-100	80-95	25-35	5-10
	8-27	Silty clay loam, silt loam.	CL, CL-ML	A-6, A-4, A-7	0	95-100	85-100	85-100	80-100	25-45	5-20
	27-45	Silty clay loam, silt loam.	CL, CL-ML	A-6, A-4, A-7	0	95-100	90-100	80-100	75-95	25-45	5-20
	45-70	Silty clay, clay, cherty silt loam.	CH, CL	A-7	0-10	80-100	70-100	60-100	55-95	40-70	16-40
NlC3---------- Nicholson	0-5	Silty clay loam	CL	A-6, A-7	0	95-100	95-100	85-100	80-100	34-45	15-20
	5-21	Silty clay loam, silt loam.	CL, CL-ML	A-6, A-4, A-7	0	95-100	85-100	85-100	80-100	25-45	5-20
	21-40	Silty clay loam, silt loam.	CL, CL-ML	A-6, A-4, A-7	0	95-100	90-100	80-100	75-95	25-45	5-20
	40-70	Silty clay, clay, cherty silt loam.	CH, CL	A-7	0-10	80-100	70-100	60-100	55-95	40-70	16-40
No---------- Nolin	0-10	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	100	95-100	90-100	80-100	25-40	5-18
	10-48	Silt loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6, A-7	0	100	95-100	85-100	75-100	25-46	5-23
	48-98	Silt loam, very gravelly loam, clay loam.	ML, CL, CL-ML, GM	A-2, A-4, A-6	0-10	50-100	50-100	40-95	35-95	<30	NP-15
OtA, OtB---------- Otwell	0-8	Silt loam--------	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-95	25-35	5-15
	8-22	Silty clay loam, silt loam.	CL, CL-ML	A-4, A-6	0	100	100	90-100	70-95	25-40	5-20
	22-38	Silty clay loam, loam, silt loam.	CL	A-6, A-7	0	95-100	95-100	85-100	65-90	35-50	20-30
	38-60	Stratified silt loam to silty clay.	CL	A-6, A-7	0	95-100	90-100	85-100	80-95	35-50	15-25

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
PcC3:*											
Pembroke	0-6	Silty clay loam	CL, CL-ML	A-4, A-6	0	95-100	90-100	80-100	70-100	25-40	5-20
	6-30	Silty clay loam	CL	A-6, A-7	0	95-100	90-100	85-100	75-100	30-45	11-25
	30-42	Silty clay loam, silty clay.	CH, CL	A-7, A-6	0	90-100	75-100	75-100	65-100	35-65	20-45
	42-75	Silty clay, clay	CH, CL	A-7	0	85-100	75-100	70-100	60-95	45-70	20-45
Crider	0-8	Silt loam	ML, CL, CL-ML	A-4, A-6	0	100	95-100	90-100	85-100	25-35	4-12
	8-38	Silt loam, silty clay loam.	CL, ML, CL-ML	A-7, A-6, A-4	0	100	95-100	90-100	85-100	25-42	4-20
	38-80	Silty clay, clay, silty clay loam.	CL, CH	A-7, A-6	0-5	85-100	75-100	70-100	60-100	35-65	15-40
Pg,* Pt.* Pits											
Ro	0-6	Silt loam	ML	A-4	0	95-100	95-100	85-100	75-100	25-35	2-10
Robertsville	6-26	Silt loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6	0	95-100	95-100	90-100	80-100	25-40	3-20
	26-48	Silty clay loam, silt loam.	ML, CL, CL-ML	A-4, A-6	0	95-100	95-100	90-100	80-100	25-40	3-20
	48-62	Silty clay loam, silty clay, silt loam.	CL, CH, CL-ML	A-6, A-7, A-4	0-5	80-100	75-100	70-100	60-100	25-60	5-35
SaA, SaB	0-8	Silt loam	ML, CL-ML	A-4	0	95-100	95-100	85-100	80-100	25-35	4-10
Sadler	8-26	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	95-100	90-100	85-100	75-100	25-40	5-20
	26-42	Silt loam, silty clay loam, loam.	ML, CL, CL-ML	A-4, A-6	0-10	85-100	80-100	70-100	55-95	20-40	2-20
	42-60	Loam, silty clay loam, gravelly loam, fine sandy loam.	ML, CL, SM, GM	A-4, A-6, A-7	0-20	65-100	60-95	50-95	35-90	20-50	2-30
SgC, SgF	0-7	Very gravelly silt loam.	SM, ML	A-2, A-4	0	95-100	90-100	55-80	20-55	<20	NP-3
Saffell	7-15	Gravelly fine sandy loam, gravelly sandy clay loam, gravelly loam.	GC, SC, SM-SC, GM-GC	A-2, A-1	0-15	35-85	25-70	20-55	15-35	20-40	4-18
	15-70	Very gravelly sandy clay loam, very gravelly fine sandy loam, very gravelly sandy clay loam.	GC, SC, SM-SC, GM-GC	A-2, A-1	0-15	35-85	25-65	20-55	15-35	20-40	4-18
ZaB, ZaC	0-6	Silt loam	CL-ML, CL, ML	A-4, A-6	0	95-100	95-100	90-100	80-100	25-40	4-15
Zanesville	6-29	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	95-100	95-100	90-100	80-100	25-40	5-20
	29-42	Silt loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6	0-3	90-100	85-100	80-100	60-100	20-40	2-20
	42-65	Sandy clay loam, clay loam, channery sandy clay loam.	SC, CL, SM, GM	A-6, A-4, A-2, A-1-B	0-10	65-100	50-95	40-95	20-85	20-40	2-20
	65	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

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

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than. Entries under "Erosion factors--T" apply to the entire profile. Absence of an entry indicates that data were not available or were not estimated]

Map symbol and soil name	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
BaE,* BaF:*							
Baxter	0-10	0.6-2.0	0.14-0.18	4.5-6.5	Low	0.32	4
	10-18	0.6-2.0	0.14-0.18	4.5-5.5	Moderate	0.24	
	18-95	0.6-2.0	0.10-0.14	4.5-5.5	Moderate	0.24	
Hammack	0-6	0.6-2.0	0.19-0.23	5.1-7.3	Low	0.32	4
	6-25	0.6-2.0	0.18-0.23	5.1-6.5	Low	0.32	
	25-30	0.6-2.0	0.05-0.10	4.5-6.0	Low	0.24	
	30-94	0.6-2.0	0.08-0.12	4.5-6.0	Moderate	0.24	
BrC, BrD	0-8	0.6-2.0	0.18-0.23	4.5-5.5	Low	0.37	3
Brandon	8-28	0.6-2.0	0.18-0.23	4.5-5.5	Low	0.28	
	28-72	2.0-20.0	0.05-0.12	4.5-5.5	Low	0.17	
BsC3, BsD3	0-4	0.6-2.0	0.18-0.23	4.5-5.5	Low	0.37	2
Brandon	4-24	0.6-2.0	0.18-0.23	4.5-5.5	Low	0.28	
	24-72	2.0-20.0	0.05-0.12	4.5-5.5	Low	0.17	
BxE:*							
Brandon	0-8	0.6-2.0	0.18-0.23	4.5-5.5	Low	0.37	3
	8-28	0.6-2.0	0.18-0.23	4.5-5.5	Low	0.28	
	28-72	2.0-20.0	0.05-0.12	4.5-5.5	Low	0.17	
Saffell	0-6	2.0-6.0	0.10-0.15	4.5-5.5	Low	0.28	4
	6-15	0.6-2.0	0.06-0.10	4.5-5.5	Low	0.28	
	15-70	0.6-2.0	0.06-0.12	4.5-5.5	Low	0.28	
Cp	0-6	2.0-6.0	0.10-0.18	4.5-6.0	Low	0.28	5
Clifty	6-34	2.0-6.0	0.08-0.16	4.5-6.0	Low	0.28	
	34-60	2.0-20	0.05-0.12	4.5-6.0	Low	0.28	
CrA, CrB	0-8	0.6-2.0	0.19-0.23	5.1-7.3	Low	0.32	4
Crider	8-40	0.6-2.0	0.18-0.23	5.1-6.0	Low	0.28	
	40-66	0.6-2.0	0.12-0.18	5.1-6.0	Moderate	0.28	
CsC:*							
Crider	0-8	0.6-2.0	0.19-0.23	5.1-7.3	Low	0.32	4
	8-40	0.6-2.0	0.18-0.23	5.1-6.0	Low	0.28	
	40-66	0.6-2.0	0.12-0.18	5.1-6.0	Moderate	0.28	
Pembroke	0-6	0.6-2.0	0.18-0.23	4.5-7.3	Low	0.32	4
	6-34	0.6-2.0	0.18-0.22	4.5-6.0	Low	0.28	
	34-46	0.6-2.0	0.13-0.19	4.5-6.0	Moderate	0.28	
	46-75	0.6-2.0	0.12-0.17	4.5-6.0	Moderate	0.28	
ElA, ElB	0-10	0.6-2.0	0.19-0.23	5.1-7.3	Low	0.32	4
Elk	10-44	0.6-2.0	0.18-0.22	5.1-6.5	Low	0.28	
	44-50	0.6-2.0	0.14-0.20	5.1-6.5	Low	0.28	
FdB:*							
Fredonia	0-9	0.6-2.0	0.18-0.22	5.1-7.3	Low	0.37	3
	9-30	0.06-0.6	0.13-0.18	5.1-7.8	Moderate	0.28	
	30	---	---	---	---	---	
Pembroke	0-6	0.6-2.0	0.18-0.23	4.5-7.3	Low	0.32	4
	6-34	0.6-2.0	0.18-0.22	4.5-6.0	Low	0.28	
	34-46	0.6-2.0	0.13-0.19	4.5-6.0	Moderate	0.28	
	46-75	0.6-2.0	0.12-0.17	4.5-6.0	Moderate	0.28	
FrD:*							
Fredonia	0-6	0.6-2.0	0.15-0.22	4.5-7.3	Low	0.43	3
	6-34	0.06-0.6	0.12-0.18	5.1-7.8	Moderate	0.28	
	34	---	---	---	---	---	

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
FrD:*							
Rock outcrop.							
FwC,* FwD,* FwF:*							
Frondorf	0-5	0.6-2.0	0.18-0.22	4.5-5.5	Low	0.32	3
	5-21	0.06-2.0	0.17-0.22	4.5-5.5	Low	0.32	
	21-29	0.6-2.0	0.08-0.16	4.5-5.5	Low	0.17	
	29	---	---	---	---	---	
Weikert	0-5	2.0-6.0	0.08-0.14	4.5-6.0	Low	0.28	2
	5-19	2.0-6.0	0.04-0.08	4.5-6.0	Low	0.28	
	19	---	---	---	---	---	
Wellston	0-5	0.6-2.0	0.18-0.22	5.1-6.5	Low	0.37	4
	5-46	0.6-2.0	0.17-0.21	4.5-5.5	Low	0.37	
	46-54	0.6-2.0	0.12-0.17	4.5-5.5	Low	0.37	
	54	---	---	---	---	---	
HaC	0-8	0.6-6.0	0.16-0.24	4.5-5.5	Low	0.32	4
Hagerstown	8-48	0.6-2.0	0.10-0.24	4.5-7.3	Moderate	0.28	
	48	---	---	---	---	---	
HbC3	0-5	0.6-6.0	0.16-0.24	4.5-5.5	Low	0.32	4
Hagerstown	5-44	0.6-2.0	0.10-0.24	4.5-7.3	Moderate	0.28	
	44	---	---	---	---	---	
HcD:*							
Hagerstown	0-8	0.6-6.0	0.16-0.24	4.5-5.5	Low	0.32	4
	8-48	0.6-2.0	0.10-0.24	5.1-7.3	Moderate	0.28	
	48	---	---	---	---	---	
Fredonia	0-6	0.6-2.0	0.15-0.22	5.1-7.3	Low	0.43	3
	6-34	0.06-0.6	0.12-0.18	5.1-7.8	Moderate	0.28	
	34	---	---	---	---	---	
HmB	0-6	0.6-2.0	0.19-0.23	5.1-7.3	Low	0.32	4
Hammack	6-25	0.6-2.0	0.18-0.23	5.1-6.5	Low	0.32	
	25-30	0.6-2.0	0.05-0.10	4.5-6.0	Low	0.24	
	30-94	0.6-2.0	0.08-0.12	4.5-6.0	Moderate	0.24	
HxC:*							
Hammack	0-6	0.6-2.0	0.19-0.23	5.1-7.3	Low	0.32	4
	6-25	0.6-2.0	0.18-0.23	5.1-6.5	Low	0.32	
	25-30	0.6-2.0	0.05-0.10	4.5-6.0	Low	0.24	
	30-94	0.6-2.0	0.08-0.12	4.5-6.0	Moderate	0.24	
Baxter	0-10	0.6-2.0	0.14-0.18	4.5-6.5	Low	0.32	4
	10-18	0.6-2.0	0.14-0.18	4.5-5.5	Moderate	0.24	
	18-95	0.6-2.0	0.10-0.14	4.5-5.5	Moderate	0.24	
HxC3:*							
Hammack	0-5	0.6-2.0	0.18-0.22	5.1-7.3	Low	0.32	4
	5-21	0.6-2.0	0.18-0.23	5.1-6.5	Low	0.32	
	21-26	0.6-2.0	0.05-0.10	4.5-6.0	Low	0.24	
	26-94	0.6-2.0	0.08-0.12	4.5-6.0	Moderate	0.24	
Baxter	0-6	0.6-2.0	0.12-0.18	4.5-6.5	Low	0.32	4
	6-14	0.6-2.0	0.14-0.18	4.5-6.5	Moderate	0.24	
	14-95	0.6-2.0	0.10-0.14	4.5-5.5	Moderate	0.24	
HxD:*							
Hammack	0-6	0.6-2.0	0.19-0.23	5.1-7.3	Low	0.32	4
	6-25	0.6-2.0	0.18-0.23	5.1-6.5	Low	0.32	
	25-30	0.6-2.0	0.05-0.10	4.5-6.0	Low	0.24	
	30-94	0.6-2.0	0.08-0.12	4.5-6.0	Moderate	0.24	
Baxter	0-10	0.6-2.0	0.14-0.18	4.5-6.5	Low	0.32	4
	10-18	0.6-2.0	0.14-0.18	4.5-5.5	Moderate	0.24	
	18-95	0.6-2.0	0.10-0.14	4.5-5.5	Moderate	0.24	

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/In	pH			
HxD3*:							
Hammack	0-5	0.6-2.0	0.18-0.22	5.1-7.3	Low	0.32	4
	5-21	0.6-2.0	0.18-0.23	5.1-6.5	Low	0.32	
	21-26	0.6-2.0	0.05-0.10	4.5-6.0	Low	0.24	
	26-94	0.6-2.0	0.08-0.12	4.5-6.0	Moderate	0.24	
Baxter	0-6	0.6-2.0	0.12-0.18	4.5-6.5	Low	0.32	4
	6-14	0.6-2.0	0.14-0.18	4.5-5.5	Moderate	0.24	
	14-95	0.6-2.0	0.10-0.14	4.5-5.5	Moderate	0.24	
La	0-8	0.6-2.0	0.19-0.23	4.5-5.5	Low	0.43	3
Lawrence	8-23	0.6-2.0	0.18-0.22	4.5-5.5	Low	0.37	
	23-43	0.06-0.2	0.08-0.12	4.5-5.5	Low	0.43	
	43-60	0.06-0.6	0.08-0.12	4.5-7.3	Low	0.37	
LbB, LbC	0-7	0.6-2.0	0.18-0.22	4.5-6.5	Low	0.43	3
Lax	7-24	0.6-2.0	0.16-0.20	4.5-5.5	Low	0.43	
	24-39	0.06-0.2	0.06-0.10	4.5-5.5	Low	0.43	
	39-49	0.06-0.2	0.06-0.10	4.5-5.5	Low	0.37	
	49-72	0.6-6.0	0.06-0.10	4.5-5.5	Moderate	0.32	
LcC3	0-3	0.6-2.0	0.16-0.20	4.5-6.5	Low	0.43	3
Lax	3-21	0.6-2.0	0.16-0.20	4.5-5.5	Low	0.43	
	21-35	0.06-0.2	0.06-0.10	4.5-5.5	Low	0.43	
	35-45	0.06-0.2	0.06-0.10	4.5-5.5	Low	0.37	
	45-72	0.6-6.0	0.06-0.10	4.5-5.5	Moderate	0.32	
LeC	0-10	0.6-2.0	0.17-0.22	4.5-6.0	Low	0.43	3
Lexington	10-31	0.6-2.0	0.16-0.21	4.5-6.0	Low	0.43	
	31-42	2.0-6.0	0.06-0.12	4.5-6.0	Low	0.24	
	42-74	2.0-6.0	0.05-0.10	4.5-6.0	Low	0.24	
LeC3*	0-5	0.6-2.0	0.17-0.22	4.5-6.0	Low	0.43	3
Lexington	5-26	0.6-2.0	0.16-0.21	4.5-6.0	Low	0.43	
	26-37	2.0-6.0	0.06-0.12	4.5-6.0	Low	0.24	
	37-74	2.0-6.0	0.05-0.10	4.5-6.0	Low	0.24	
LfD*	0-10	0.6-2.0	0.17-0.22	4.5-6.0	Low	0.43	3
Lexington	10-31	0.6-2.0	0.16-0.21	4.5-6.0	Low	0.43	
	31-42	2.0-6.0	0.06-0.12	4.5-6.0	Low	0.24	
	42-74	2.0-6.0	0.05-0.10	4.5-6.0	Low	0.24	
Ln	0-7	0.6-2.0	0.20-0.26	5.6-7.8	Low	0.43	3
Lindside	7-47	0.6-2.0	0.17-0.22	5.1-7.8	Low	0.43	
	47-60	0.2-2.0	0.12-0.18	5.6-7.8	Low	0.43	
Me	0-8	0.6-2.0	0.18-0.23	6.1-7.8	Low	0.43	5
Melvin	8-60	0.6-2.0	0.18-0.23	6.1-7.8	Low	0.43	
Ne	0-7	0.6-2.0	0.15-0.23	5.6-7.8	Low	0.43	5
Newark	7-35	0.6-2.0	0.18-0.23	5.6-7.8	Low	0.43	
	35-60	0.6-2.0	0.15-0.22	5.6-7.8	Low	0.43	
NhA, NhB, NhC	0-8	0.6-2.0	0.19-0.23	4.5-6.5	Low	0.43	3
Nicholson	8-27	0.6-2.0	0.18-0.22	4.5-6.5	Low	0.43	
	27-45	0.06-0.2	0.07-0.12	4.5-6.5	Low	0.43	
	45-70	0.06-0.6	0.07-0.12	5.1-7.8	Moderate	0.37	
NlC3	0-5	0.6-2.0	0.18-0.22	4.5-6.5	Low	0.43	3
Nicholson	5-21	0.6-2.0	0.18-0.22	4.5-6.5	Low	0.43	
	21-40	0.06-0.2	0.07-0.12	4.5-6.5	Low	0.43	
	40-70	0.06-0.6	0.07-0.12	5.1-7.8	Moderate	0.37	

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
No----------	0-10	0.6-2.0	0.18-0.23	5.6-7.8	Low----------	0.43	5
Nolin	10-48	0.6-2.0	0.18-0.23	5.6-7.8	Low----------	0.43	
	48-98	0.6-6.0	0.10-0.23	5.6-7.8	Low----------	0.43	
OtA, OtB----------	0-8	0.6-2.0	0.22-0.24	4.5-7.3	Low----------	0.43	3
Otwell	8-22	0.6-2.0	0.18-0.22	5.1-5.5	Low----------	0.43	
	22-38	<0.06	0.06-0.08	4.5-5.5	Low----------	0.43	
	38-60	0.06-0.2	0.19-0.21	5.1-5.5	Low----------	0.43	
PcC3:*							
Pembroke--------	0-6	0.6-2.0	0.18-0.22	4.5-7.3	Low----------	0.32	3
	6-30	0.6-2.0	0.18-0.22	4.5-6.0	Low----------	0.28	
	30-42	0.6-2.0	0.13-0.19	4.5-6.0	Moderate-------	0.28	
	42-75	0.6-2.0	0.12-0.17	4.5-6.0	Moderate-------	0.28	
Crider----------	0-8	0.6-2.0	0.19-0.23	5.1-7.3	Low----------	0.32	4
	8-38	0.6-2.0	0.18-0.23	5.1-6.0	Low----------	0.28	
	38-80	0.6-2.0	0.12-0.18	5.1-6.0	Moderate-------	0.28	
Pg,* Pt.*							
Pits							
Ro----------	0-6	0.6-2.0	0.19-0.23	3.6-5.5	Low----------	0.43	3
Robertsville	6-26	0.6-2.0	0.18-0.22	3.6-5.5	Low----------	0.43	
	26-48	0.06-0.2	0.08-0.12	3.6-5.5	Low----------	0.43	
	48-62	0.2-0.6	0.08-0.12	4.5-7.3	Low----------	0.37	
SaA, SaB----------	0-8	0.6-2.0	0.19-0.23	4.5-5.5	Low----------	0.43	3
Sadler	8-26	0.6-2.0	0.18-0.22	4.5-5.5	Low----------	0.43	
	26-42	0.06-0.2	0.07-0.12	4.5-5.5	Low----------	0.43	
	42-60	0.2-2.0	0.07-0.12	4.5-5.5	Low----------	0.43	
SgC, SgF----------	0-7	2.0-6.0	0.07-0.15	4.5-5.5	Low----------	0.24	4
Saffell	7-15	0.6-2.0	0.06-0.10	4.5-5.5	Low----------	0.28	
	15-70	0.6-2.0	0.06-0.12	4.5-5.5	Low----------	0.28	
ZaB, ZaC----------	0-6	0.6-2.0	0.19-0.23	4.5-5.5	Low----------	0.37	3
Zanesville	6-29	0.6-2.0	0.17-0.22	4.5-5.5	Low----------	0.37	
	29-42	0.06-0.6	0.08-0.12	4.5-5.5	Low----------	0.37	
	42-65	0.2-2.0	0.08-0.12	4.5-5.5	Low----------	0.28	

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

TABLE 16.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Map symbol and soil name	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
BaE,* BaF:*											
Baxter	B	None	---	---	>6.0	---	---	>60	---	High	High.
Hammack	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
BrC, BrD, BsC3, BsD3---Brandon	B	None	---	---	>6.0	---	---	>60	---	Moderate	High.
BxE:*											
Brandon	B	None	---	---	>6.0	---	---	>60	---	Moderate	High.
Saffell	B	None	---	---	>6.0	---	---	>60	---	Low	Moderate.
Cp---Clifty	B	Occasional	Brief	Dec-May	>6.0	---	---	>60	---	Low	High.
CrA, CrB---Crider	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
CsC:*											
Crider	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
Pembroke	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
ElA, ElB---Elk	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
FdB:*											
Fredonia	C	None	---	---	>6.0	---	---	20-40	Hard	High	Moderate.
Pembroke	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
FrD:*											
Fredonia	C	None	---	---	>6.0	---	---	20-40	Hard	High	Moderate.
Rock outcrop.											
FwC,* FwD,* FwF:*											
Frondorf	B	None	---	---	>6.0	---	---	20-40	Soft	Moderate	High.
Weikert	C/D	None	---	---	>6.0	---	---	10-20	Soft	Moderate	Moderate.
Wellston	B	None	---	---	>6.0	---	---	>40	Hard	Moderate	High.
HaC, HbC3---Hagerstown	C	None	---	---	>6.0	---	---	>40	Hard	Moderate	Low.
HcD:*											
Hagerstown	C	None	---	---	>6.0	---	---	>40	Hard	Moderate	Low.
Fredonia	C	None	---	---	>6.0	---	---	20-40	Hard	High	Moderate.
HmB---Hammack	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
HxC,* HxC3,* HxD,* HxD3:*											
Hammack	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
Baxter	B	None	---	---	>6.0	---	---	>60	---	High	High.
La---Lawrence	C	Rare	---	---	1.0-2.0	Perched	Dec-Apr	>60	---	High	High.

See footnote at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
LbB, LbC, LcC3---- Lax	C	None--------	---	---	2.0-2.5	Perched	Dec-Mar	>60	---	High-----	Moderate.
LeC, LeC3,* LfD*-- Lexington	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
Ln---------- Lindside	C	Occasional--	Brief-----	Sep-Jun	1.5-3.0	Apparent	Dec-Apr	>60	---	Moderate	Low.
Me---------- Melvin	D	Occasional--	Brief-----	Dec-May	0-1.0	Apparent	Dec-May	>60	---	High-----	Low.
Ne---------- Newark	C	Occasional--	Brief-----	Dec-May	0.5-1.5	Apparent	Dec-May	>60	---	High-----	Low.
NhA, NhB, NhC, NlC3---------- Nicholson	C	None--------	---	---	1.5-2.5	Perched	Dec-Apr	>60	---	High-----	Moderate.
No---------- Nolin	B	Occasional	Brief-----	Dec-May	3.0-6.0	Apparent	Feb-Mar	>60	---	Low------	Moderate.
OtA, OtB---------- Otwell	C	None--------	---	---	1.5-2.5	Perched	Dec-Apr	>60	---	Moderate	High.
PcC3:* Pembroke---------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
Crider----------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
Pg,* Pt.* Pits											
Ro---------- Robertsville	D	Occasional	Brief-----	Dec-Apr	0-1.0	Perched	Dec-Apr	>60	---	High-----	High.
SaA, SaB---------- Sadler	C	None--------	---	---	1.5-2.0	Perched	Dec-Apr	>50	Hard	Moderate	High.
SgC, SgF---------- Saffell	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
ZaB, ZaC---------- Zanesville	C	None--------	---	---	2.0-3.0	Perched	Dec-Apr	>40	Hard	Moderate	High.

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

TABLE 17.--ENGINEERING INDEX TEST DATA

Soil name, report number, horizon, and depth in inches	Classification		Grain size distribution											Liquid limit	Plasticity index	Moisture density	
			Larger than 3 inches	Percentage passing sieve--						Percentage smaller than--						Max. dry density	Optimum moisture
	AASHTO	Unified		2 inch	3/4 inch	3/8 inch	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm				
			Pct											Pct		Lb/ ft3	Pct
Baxter cherty silt loam:[1] (S73KY-111-012)																	
B21t-----18 to 28	A-7-6(14)	CL	0	100	92	90	85	69	67	63	53	39	35	49	25	98	23
B24t-----48 to 80	A-7-6(17)	CH	17	100	69	66	63	56	56	55	47	38	33	59	38	91	28
Brandon silt loam:[2] (S73KY-111-014)																	
B21t-----12 to 28	A-4 (07)	ML	0	100	100	98	96	94	91	88	64	35	28	33	7	99	16
IIB24t---41 to 60	A-2-7(01)	GC	0	100	79	67	57	50	43	35	29	24	20	42	17	106	17
IIB3t----60 to 72	A-2-6(01)	GC	0	100	86	74	62	53	41	30	25	20	18	32	14	112	15
Nicholson silt loam:[3] (S74KY-221-019)																	
B21t------8 to 21	A-6 (14)	CL	0	100	100	100	100	87	87	86	64	33	28	40	16	103	20
Bx1------27 to 45	A-4 (07)	CL	0	100	100	99	99	98	95	92	59	28	22	29	8	109	15
IIBx2----45 to 55	A-4 (01)	GC	0	100	68	57	52	48	45	42	29	15	11	30	10	108	17
IIB23t---55 to 70	A-7-6(15)	CL	0	100	90	87	85	81	79	75	57	40	36	41	21	100	22
Saffell gravelly silt loam:[4] (S73KY-111-015)																	
B21t-----15 to 27	A-2-6(01)	GC	10	100	70	57	48	40	34	31	23	15	13	35	16	108	17
B22t-----27 to 44	A-2-6(00)	GC	10	100	87	75	63	57	43	32	25	17	13	29	11	112	14
B23t-----44 to 70	A-2-4(00)	GC	10	100	79	68	57	47	34	25	20	13	10	30	9	113	14

[1]Baxter cherty silt loam:
100 feet southeast of farm lane, 1 3/10 miles northeast of Highway 525, and 1 5/10 miles southwest of junction of Highways 139 and 525.

[2]Brandon silt loam:
2 2/10 miles north of Tennessee State line, 1 6/10 miles east of Joiner Chapel, in western part of Fort Campbell Reservation.

[3]Nicholson silt loam:
50 feet north of Kentucky Highway 778, 1 2/10 miles southeast of junction of Kentucky Highways 276 and 778, about 7 miles northeast of Cadiz. This pedon is a taxadjunct to the Nicholson series because more chert is in the IIBx2 horizon than is typical for the series.

[4]Saffell gravelly silt loam:
2 1/10 miles north of Tennessee State line, 1 6/10 miles east of Joiner Chapel, in western part of Fort Campbell Reservation.

TABLE 18.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Baxter	Fine, mixed, mesic Typic Paleudalfs
Brandon	Fine-silty, mixed, thermic Typic Hapludults
Clifty	Fine-loamy, mixed, mesic Fluventic Dystrochrepts
Crider	Fine-silty, mixed, mesic Typic Paleudalfs
Elk	Fine-silty, mixed, mesic Ultic Hapludalfs
Fredonia	Fine, mixed, mesic Typic Hapludalfs
Frondorf	Fine-loamy, mixed, mesic Ultic Hapludalfs
Hagerstown	Fine, mixed, mesic Typic Hapludalfs
Hammack*	Fine-silty, mixed, mesic Glossic Paleudalfs
Lawrence	Fine-silty, mixed, mesic Aquic Fragiudalfs
Lax*	Fine-silty, siliceous, thermic Typic Fragiudults
Lexington	Fine-silty, mixed, thermic Typic Paleudalfs
Lindside*	Fine-silty, mixed, mesic Fluvaquentic Eutrochrepts
Melvin	Fine-silty, mixed, nonacid, mesic Typic Fluvaquents
Newark	Fine-silty, mixed, nonacid, mesic Aeric Fluvaquents
Nicholson*	Fine-silty, mixed, mesic Typic Fragiudalfs
Nolin	Fine-silty, mixed, mesic Dystric Fluventic Eutrochrepts
Otwell*	Fine-silty, mixed, mesic Typic Fragiudalfs
Pembroke*	Fine-silty, mixed, mesic Mollic Paleudalfs
Robertsville	Fine-silty, mixed, mesic Typic Fragiaqualfs
Sadler	Fine-silty, mixed, mesic Glossic Fragiudalfs
Saffell	Loamy-skeletal, siliceous, thermic Typic Hapludults
Weikert	Loamy-skeletal, mixed, mesic Lithic Dystrochrepts
Wellston*	Fine-silty, mixed, mesic Ultic Hapludalfs
Zanesville	Fine-silty, mixed, mesic Typic Fragiudalfs

*The soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series.

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