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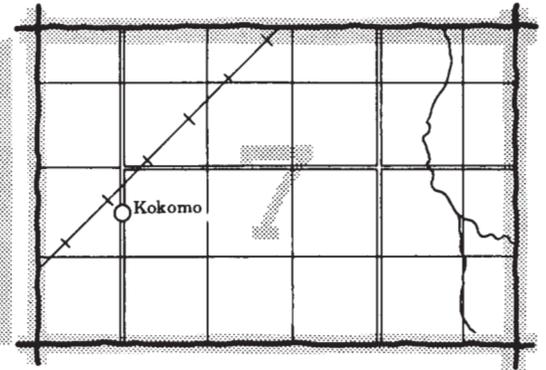
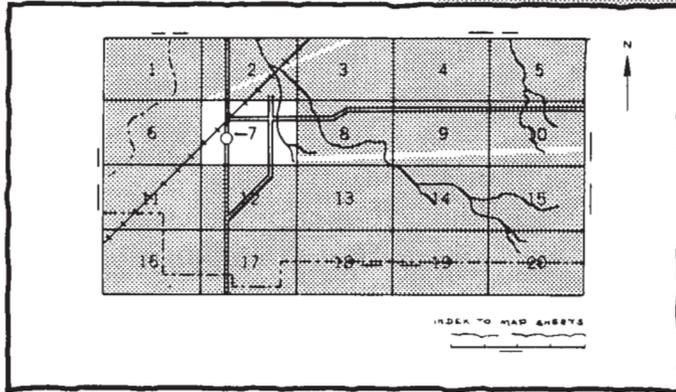
In Cooperation with  
Virginia Polytechnic Institute  
and State University

# Soil Survey of Albemarle County, Virginia



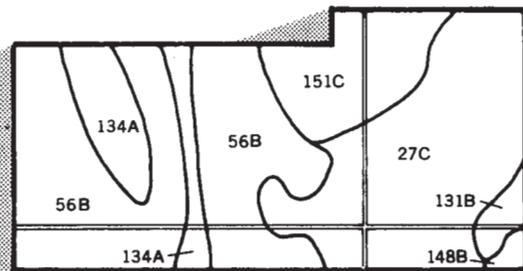
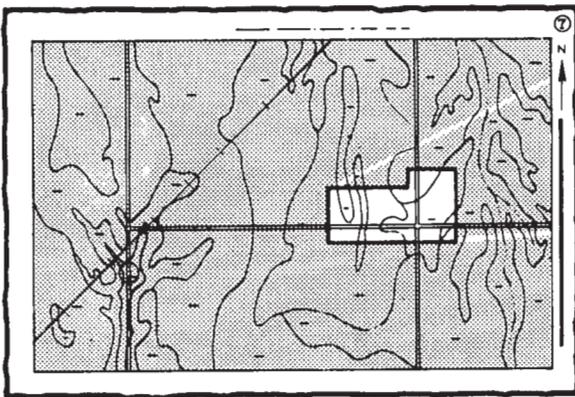
# HOW TO USE

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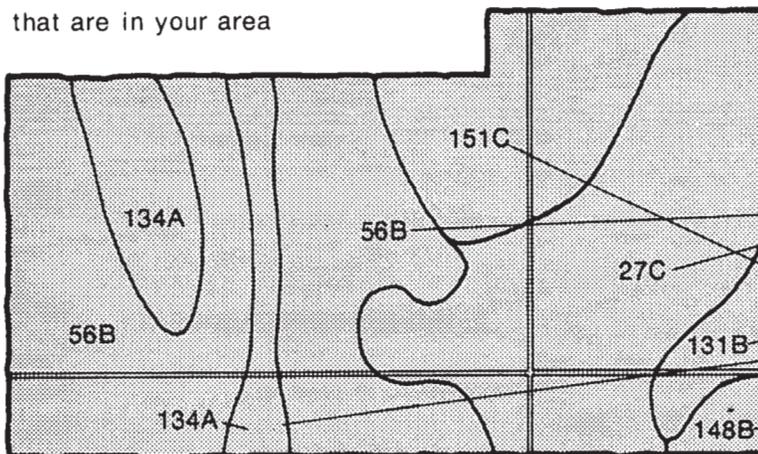


2. Note the number of the map sheet and turn to that sheet.

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



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



## Symbols

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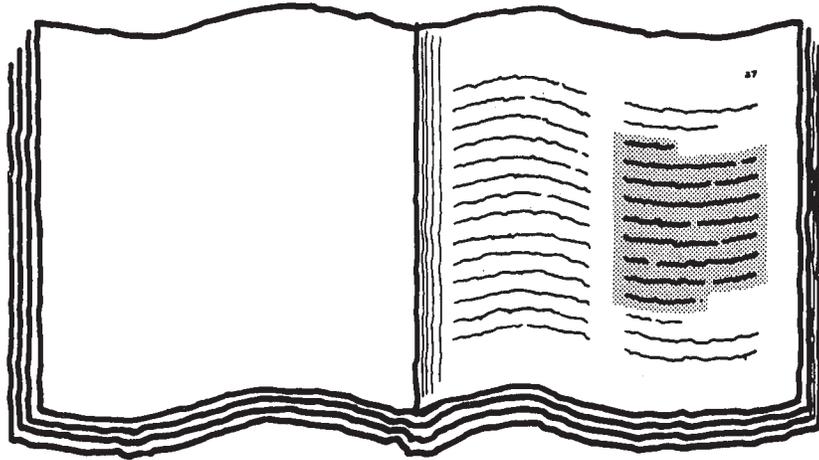
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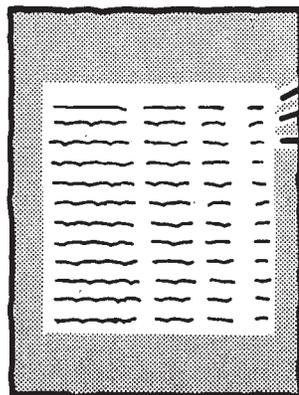
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# THIS SOIL SURVEY

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.

A detailed illustration of a table with multiple columns and rows, representing the 'Index to Soil Map Units'. The table is shaded with a halftone pattern. A light gray beam of light from the book illustration points to this table.

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

Three detailed illustrations of tables, each with a caption and a grid of data. The top table is labeled 'TABLE 1 - Summary of Tables', the middle one 'TABLE 2 - Summary of Tables', and the bottom one 'TABLE 3 - Summary of Tables'. Each table is shaded with a halftone pattern.

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

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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 completed in 1981. Soil names and descriptions were approved in 1981. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1980. This survey was made cooperatively by the Soil Conservation Service and the Virginia Polytechnic Institute and State University. It is part of the technical assistance furnished to the Thomas Jefferson Soil and Water Conservation District. This survey was financed partly by the Virginia Soil and Water Conservation Commission and the Albemarle County Board of Supervisors.

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: Monticello, the home of Thomas Jefferson, in an area of Davidson clay loam, 2 to 7 percent slopes. Thomas Jefferson, an early leader in conservation in this nation, recognized the features of a productive soil and chose an excellent site for his home. Photo by courtesy of the Thomas Jefferson Memorial Foundation.**

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# Foreword

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This soil survey contains information that can be used in land-planning programs in Albemarle County, Virginia. 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.

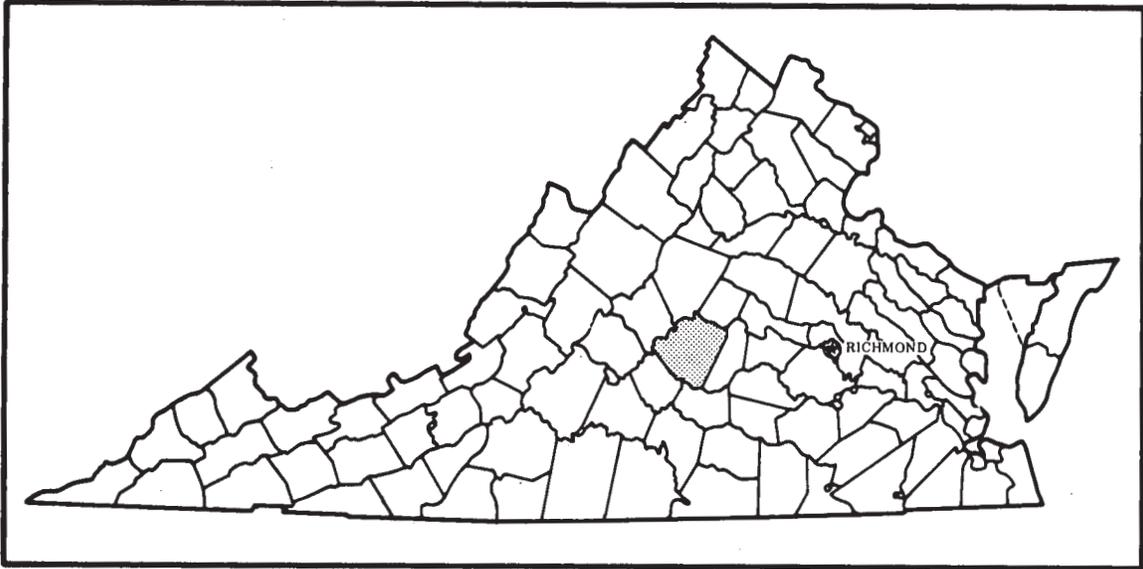
This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey 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.



Manly Wilder  
State Conservationist  
Soil Conservation Service



**Location of Albemarle County in Virginia.**

# Soil Survey of Albemarle County, Virginia

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By John B. Carter, Kenneth E. Harward, and Rim C. Gardner  
Soil Conservation Service

Fieldwork by John B. Carter, James D. Wright, Jr., Rim C. Gardner  
Roy L. Vick, Jr., Kenneth E. Harward, Earl H. Brunger, Louis W. Heidel  
and John C. Nicholson, Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service  
in cooperation with Virginia Polytechnic Institute and State University

ALBEMARLE COUNTY is in north central Virginia. The county is about 39 miles north and south and about 21 miles east and west. The total area of the county is about 741 square miles, or 474,000 acres. Charlottesville is the county seat.

Greene and Orange Counties form the northern boundary of Albemarle County. Louisa and Fluvanna Counties are along the eastern boundary. The James River is the southeastern boundary and separates Albemarle County from Buckingham County. Nelson County is on the south. The crest of the Blue Ridge is the western boundary and separates Albemarle County from Augusta and Rockingham Counties.

Many of the soils in the county are suited to a large number of crops, and farming is an important occupation. The climate is favorable for general farming and the raising of livestock. Many areas of the county are suited to the use of modern farm machinery. Much of the land in farms is used for pasture and hay. Corn, barley, oats, and other crops are grown and are fed mainly to livestock. Dairy cattle and beef cattle are the dominant livestock, but some sheep, hogs, and horses are also raised. Poultry and poultry products and orchards are important sources of farm income.

In 1964 about 75 percent of the total income from farm products was derived from the sale of livestock and livestock products, including dairy products and poultry and poultry products.

Many industries are in the county. Among these are manufacturers of office equipment, frozen foods, aircraft instruments, and telephone equipment. Also included are manufacturers of tire cord and fabric, welding products, circuit breakers, and panel boards. Other industries are lumber mills, grain mills, and radio and television transmitting.

About 60 percent of the survey area is wooded. Wood products are important to the economy of the county.

An older soil survey of Albemarle County was published in 1940. The present survey updates the earlier one and provides additional information and larger maps that show the soils in greater detail.

## General Nature of the Survey Area

This section gives general information about the county. It discusses history and development; climate; physiography, geology, and drainage; water supply; and transportation.

## History and Development

Settlement of the survey area started about 1734. Albemarle County was formed from a part of Goochland County in 1744. It was named in honor of the second Earl of Albemarle, who later became Governor of Virginia. The first courthouse was built in 1745 near

present-day Scottsville. In 1761 the courthouse was moved north near the Rivanna River. Here, Charlottesville was established in 1762 and was incorporated as a city in 1888. Today, the city of Charlottesville covers about 10 square miles or 6,600 acres.

In 1980, the population of Albemarle County was about 50,600. This did not include Charlottesville, which had a population of about 45,000.

The survey area abounds in many points of historic and scenic interest and draws thousands of visitors throughout the year. Monticello, the home of Thomas Jefferson; Ash Lawn, the home of James Monroe; The University of Virginia, and the Shenandoah National Park are among the most visited places.

## Climate

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

Table 1 gives data on temperature and precipitation for the survey area as recorded at Charlottesville in the period 1949 to 1978. 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 37 degrees F, and the average daily minimum temperature is 28 degrees. The lowest temperature on record, which occurred at Charlottesville on January 17, 1977, is -2 degrees. In summer the average temperature is 75 degrees, and the average daily maximum temperature is 85 degrees. The highest recorded temperature, which occurred at Charlottesville on September 7, 1954, is 107 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 (40 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 inches. Of this, 24 inches, or 54 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 20 inches. The heaviest 1-day rainfall during the period of record was 7.49 inches at Charlottesville on June 29, 1972. Thunderstorms occur on about 24 days each year, and most occur in summer.

The average seasonal snowfall is 23 inches. The greatest snow depth at any one time during the period of record was 20 inches. On an average of 6 days, at least 1 inch of snow is on the ground. The number of such days varies greatly from year to year.

## Physiography, Geology, and Drainage

Albemarle County is within the Piedmont and Blue Ridge physiographic provinces. Elevation ranges from 250 feet where the Rivanna River and the James River leave the county to 3,250 feet at the summit of Loft Mountain.

The Piedmont province makes up about 82 percent of the county. It is well dissected by many small streams and rivers that flow in narrow, meandering valleys. The landscape is mostly gently sloping to moderately steep, but in places it is steep. Along the lower tributaries of the major streams, entrenchment has been rapid and bluffs and V-shaped valleys are common. The walls of the valleys are steep, and they rise abruptly from the flood plains.

This province is broken in places by long, low hills and mountains. These include Ragged Mountain, Dudley Mountain, Fan Mountain, Bucks Mountain, Piney Mountain, and Southwest Mountain. Elevation ranges from 1,200 feet to 2,400 feet in these mountains. The low hills range from 600 to 1,200 feet in elevation. The smoothest relief in the Piedmont province is east of Southwest Mountain. The elevation ranges from 250 to 600 feet. Most of the soils are well drained throughout the Piedmont, but a few poorly drained soils are along streams, on toe slopes, and in a few saddles.

The Blue Ridge province makes up most of the western part of the county and is only 18 percent of the total land area. It is steep and rugged. It has been strongly dissected by many intermittent and permanent streams that have cut deep, narrow valleys bordered by steep rocky slopes and narrow ridges. Slopes are moderately steep to very steep. Elevation ranges from about 1,200 feet to 3,250 feet. The soils are stony, shallow to deep, and well drained to excessively drained.

Albemarle County is drained by the James River and three of its major tributaries, the Rockfish, Hardware, and Rivanna Rivers, and the numerous tributaries of these rivers. The headwaters of the South Anna River extend into this county a fraction of a mile near Gordonsville. The headwaters of the North Anna River extend into this county over a mile near Barboursville. All of the tributaries of the James River flow in entrenched, meandering channels that cross the structural trend of this area. The drainage, in places, is in a well defined trellis pattern. In other places, it is in a poorly defined pattern of the same type.

The rocks of Albemarle County are igneous, sedimentary, and metamorphic.

## Water Supply

Albemarle County is within two major watersheds. About 98 percent is within the James River watershed and 2 percent is within the York River watershed.

The Rivanna River, a major tributary of the James River, drains a large part of the northern and central sections of the county. The principal tributaries of the Rivanna River include the North Fork Rivanna River, Buck Mountain Creek, Moormans River, and Mechum River. The southern part of the county is drained by the Hardware River and a few small tributaries of the James River. The James River forms the southeastern boundary of the county. A small northeastern part of the county that is in the York River watershed is drained by small headwater tributaries of the South Anna River and the Rapidan River.

Surface water is soft and of good quality. There are five reservoirs in the county being used for water supply. Charlottesville, Crozet, and Scottsville have publicly owned water systems.

Albemarle County is within the unglaciated Appalachian ground water region, which is characterized by mountains and hilly uplands separated by broad valleys. The availability of ground water in a given area varies as a result of differences in the underlying rock formation. Adequate ground water supplies for domestic, public, and industrial uses can be developed in most areas of Albemarle County. The eastern part of the county offers the lowest ground water potential. Wells in the county range from 30 to 1,100 feet in depth. Water yields range from 1 gallon to 165 gallons per minute. Depth to hard rock ranges from 2 to 110 feet below the surface.

In most parts of the county an adequate supply of water is obtained from springs, wells, and streams. Farm ponds are used to supply water for livestock. Approximately 1,200 farm ponds have been built in the county.

## Transportation

Albemarle County has approximately 31 miles of interstate highway. Interstate 64 crosses the center of the county. It runs from the top of the Blue Ridge in Nelson County to the southern tip of Charlottesville and through Fluvanna County en route to Richmond.

There are approximately 146 miles of primary roads in the county. Of these, about 45 miles are divided highway or three-lane highway. U.S. Highway 29 runs north and south, and U.S. Highway 250 runs east and west. They intersect in the city of Charlottesville. There are approximately 745 miles of secondary roads in the county. Of these, about 477 miles are hard-surface. Except during periods of extreme weather most farms have fairly easy access to markets and to Charlottesville.

Major railroads in the county provide freight and passenger service to parts of the county and to connected points outside the county.

An airport is near Charlottesville. This airport is served by a major airline that maintains daily schedules to other

cities in Virginia and to connecting points outside the state.

Motor freight service is provided by local and long-distance carriers. Major commercial buslines serve the county with daily schedules and charter, freight, and express package service. Some city buslines provide transportation within cities. Several companies offer taxi service throughout the county.

## How This Survey Was Made

This survey was made to provide information about the soils in the survey area. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; the kinds of crops and native plants growing on the soils; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biologic activity.

The soils in the survey area occur in an orderly pattern that is related to the geology, the landforms, relief, climate, and the natural vegetation of the area. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientist to predict with considerable accuracy the kind of soil at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another resulting in gradual changes in characteristics. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, acidity, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil

characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpreted the data from these analyses and tests as well as the field-observed characteristics and the soil properties in terms of expected behavior of the soils under different uses. Interpretations for all of the soils were field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and new interpretations sometimes are developed to meet local needs. Data were assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management were assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can state with a fairly high degree of probability that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

## Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by several kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. These latter soils are called inclusions or included soils.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use of require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed, and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soils on the landscape.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of the soil data. The objective of soil mapping is not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation to precisely define and locate the soil is needed to plan for intensive uses in small areas.

# General Soil Map Units

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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.

## Upland Areas of the Blue Ridge

These soils are in the western part of the survey area. They formed in the residuum of greenstone, granite, and gneiss. Most of the soils have rock fragments on the surface. Most of the soils are strongly sloping to steep, but some on ridgetops and in colluvial areas are gently sloping.

### 1. Myersville-Catoctin-Lew

*Deep and moderately deep, well drained soils that have stones on the surface and a loamy subsoil; formed in colluvium or material weathered from greenstone*

This map unit consists of high mountain ridges, mountain sides, and colluvial slopes in mountains. The ridges are strongly sloping, the mountain sides are moderately steep or steep, and the colluvial slopes are strongly sloping or moderately steep.

This map unit makes up about 6 percent of the county. It is about 49 percent Myersville soils, 23 percent Catoctin soils, and 11 percent Lew soils. Soils of minor extent make up about 17 percent.

The Myersville and Catoctin soils are strongly sloping to steep and are in a complex pattern on the landscape. They have a dark brown silt loam surface layer that is very stony. The Myersville soils have a yellowish red silty clay loam subsoil. The Catoctin soils have a strong brown very channery silt loam subsoil.

The Lew soils are mostly along drainageways and are strongly sloping and moderately steep. They have a dark brown channery silt loam surface layer that is very stony or extremely stony. The subsoil is yellowish red very channery silty clay loam.

Of minor extent in this map unit are the well drained Hartleton soils on ridges and mountain sides and the excessively drained Cataska soils on the steeper positions.

Most of the acreage of this map unit is wooded (fig. 1). A small acreage is used for pasture. All of the Skyline Drive in Albemarle County is in areas of this map unit.

The soils in this map unit are not suited to cultivation. They are moderately well suited to poorly suited to pasture. They are suited to trees. Potential productivity for trees is moderate to high. The steep slope, however, restricts the use of logging equipment. Erosion is a hazard along logging roads and skid trails.

This map unit is poorly suited to sanitary facilities and building sites. Slope and rock fragments are the main limitations.

### 2. Parker-Chester-Porters

*Deep, excessively drained and well drained soils that have stones on the surface and a loamy subsoil; formed in material weathered from granite and gneiss*

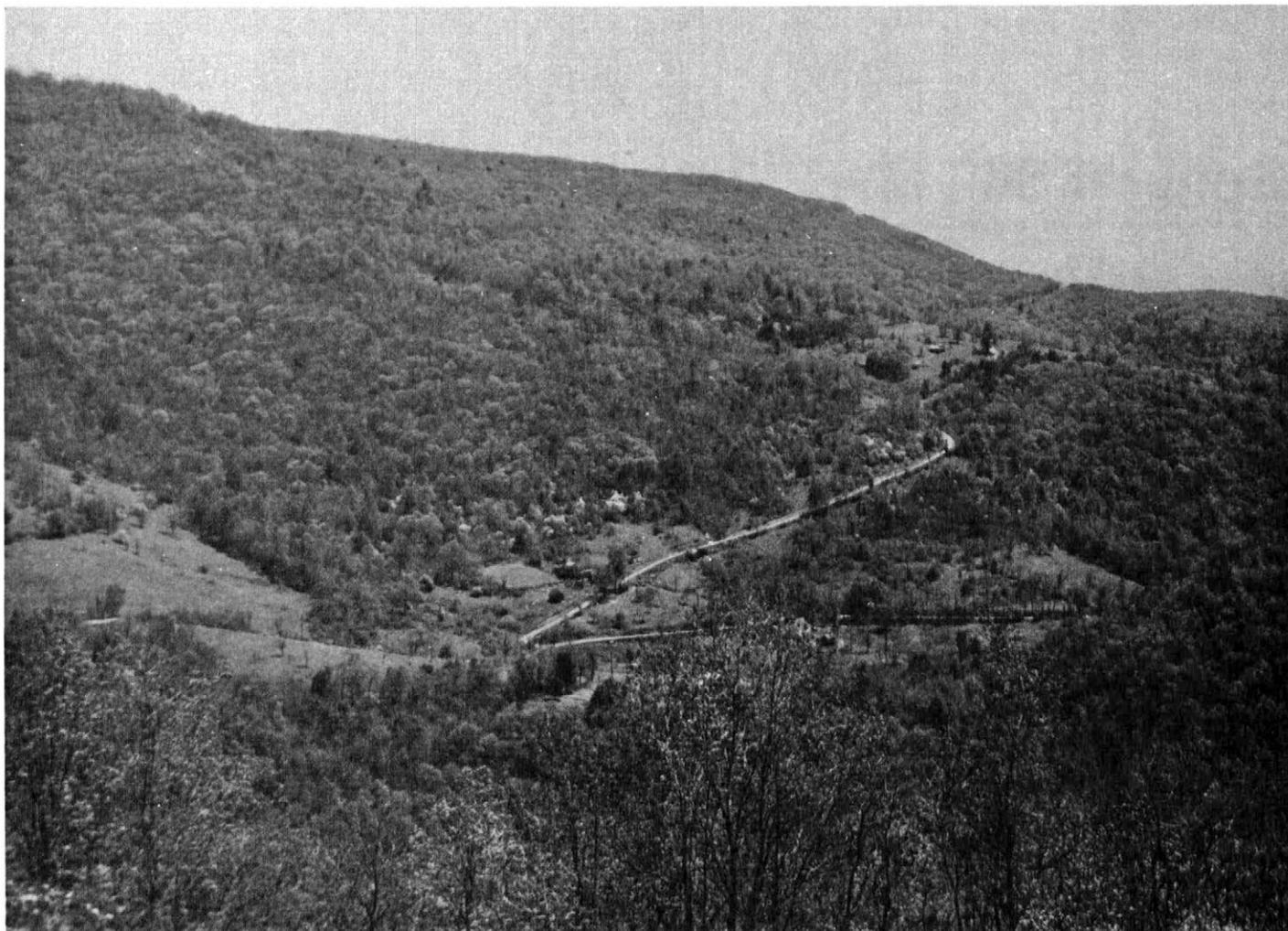
This map unit consists of mountain ridges and sides slopes in mountains. The ridges are strongly sloping, and the side slopes are moderately steep or steep.

This map unit makes up about 11 percent of the county. It is about 43 percent Parker soils, 34 percent Chester soils, and 4 percent Porters soils. Soils of minor extent make up about 19 percent.

The Parker soils are mainly on side slopes and narrow convex ridgetops and are excessively drained. They have a brownish yellow very cobbly loam surface layer that is very stony or extremely stony. The subsoil is dark yellowish brown extremely cobbly loam.

The Chester soils are mostly on side slopes and ridges and are well drained. They have a very stony dark brown loam surface layer and a yellowish red clay loam subsoil.

The Porters soils are mostly on ridges and on north- or west-facing side slopes and are well drained. They have a black cobbly loam surface layer that is very stony. The subsoil is brown loam.



**Figure 1.—An area of the Myersville-Catoctin-Lew map unit on side slopes of the Blue Ridge. Catoctin very stony silt loam, 7 to 15 percent slopes, is near the top left; Lew very stony silt loam, 15 to 25 percent slopes, is near the middle of the slopes; and Myersville silt loam, 7 to 15 percent slopes, is in the cleared area near the road.**

Of minor extent in this map unit are the somewhat excessively drained Ashe soils and the well drained Cullen and Hayesville soils on broad ridgetops and side slopes on uplands. The well drained Braddock, Dyke, Thurmont, and Unison soils are on uplands on old colluvial terraces and side slopes, and the well drained Hiwassee soils are on high stream terraces on uplands. Also of minor extent, on recent alluvial or colluvial positions, are the somewhat poorly drained Belvoir soils, the well drained Lew soils, the moderately well drained to well drained Meadowville soils, the well drained Tusquitee soils, and the poorly drained Worsham soils. These soils are along streams, at the heads of

drainageways, and in depressions. The well drained Craigsville and Toccoa soils are on flood plains.

Most of the acreage of this map unit is in woodland. Some of the acreage on the less steep slopes is used for pasture.

The soils in this map unit are not suitable for cultivation mainly because of the very stony surface layer and steep slope. They are moderately well suited to poorly suited to pasture, depending on the steepness of slope and the amount of stones on the surface. Establishing and maintaining a mixture of grasses and legumes and prevention of overgrazing are major pasture management concerns.

These soils are well suited to trees. Potential productivity for trees is moderately high to high, and the soils are managed mostly for mixed hardwoods. The steep slope, however, restricts the use of logging equipment, and erosion is a hazard along logging roads and skid trails. The soils are poorly suited to sanitary facilities and building site development. Steep slope and rock fragments are the main limitations.

### **Colluvial Terraces in the Blue Ridge and on the Piedmont**

These soils are in the western part of the survey area at the base of the Blue Ridge. They formed in colluvial material derived mainly from granite and greenstone that was washed out of the Blue Ridge. Some of the soils have rock fragments on the surface. Most of the soils are on gently sloping broad ridgetops and strongly sloping to moderately steep side slopes.

#### **3. Braddock-Thurmont-Unison**

*Deep, well drained soils that have a clayey or loamy subsoil; formed in colluvium*

This map unit consists of broad to narrow colluvial ridges and side slopes that extend outward from the base of mountains. The ridges are gently sloping, and the side slopes are strongly sloping or moderately steep.

This map unit makes up about 8 percent of the county. It is about 32 percent Braddock soils, 18 percent Thurmont soils, and 8 percent Unison soils. Soils of minor extent make up about 42 percent.

The Braddock soils have a brown loam surface layer and a red clay subsoil. The surface layer is very stony in some areas.

The Thurmont soils have a brown loam surface layer and a yellowish red clay loam subsoil. The surface layer is very stony in some areas.

The Unison soils have a dark brown silt loam surface layer and a reddish brown clay and silty clay loam subsoil. The surface layer is very stony in some areas.

Of minor extent in this map unit, on residual uplands, are the somewhat excessively drained Ashe soils on side slopes and narrow ridgetops and the well drained Chester, Cullen, and Hayesville soils on broad to narrow ridgetops and side slopes. On alluvial or colluvial uplands are the well drained Dyke soils on old colluvial terraces and side slopes and the well drained Hiwassee soils on high stream terraces. On recent alluvial or colluvial positions are the somewhat poorly drained Belvoir soils, the well drained Starr soils, and the poorly drained Worsham soils along streams, at the heads of drainageways, and in depressions. On flood plains are the somewhat poorly drained Chewacla soils, the well drained Riverview soils, and the poorly drained Wehadkee soils.

About three-fourths of the acreage of this map unit is used for cultivated crops, hay, and pasture. Some of the acreage is in woodland, and some is in Urban land.

The gently sloping soils are well suited to cultivated crops, hay, and pasture. The strongly sloping soils are moderately well suited to cultivated crops and hay. They are well suited to pasture. The hazard of erosion, the need to increase organic matter in the surface layer, and the need to increase the fertility are major management concerns.

The soils in this map unit are well suited to trees. Potential productivity for trees ranges from moderately high to high. A few areas are managed for mixed hardwoods and pines.

This map unit is limited for nonfarm uses because of the moderately permeable clayey subsoil and moderate shrink-swell potential. These are limitations for sanitary facilities and building site development.

### **Upland Areas of the Piedmont**

These soils are in the central and eastern parts of the survey area. They formed in residuum from granite, quartz mica schist, greenstone, sericitic schist, Triassic shale and conglomerate, arkosic sandstone, amphibolite, soapstone, granite gneiss, and limestone. Some of the soils have stones or gravel on the surface. Most of the soils are on gently sloping ridges and strongly sloping side slopes. Some of the soils are on moderately steep and steep side slopes along deeply incised drainageways and streams.

#### **4. Hayesville-Ashe-Chester**

*Deep and moderately deep, well drained and somewhat excessively drained soils that have a clayey or loamy subsoil; formed in material weathered from granite and gneiss*

This map unit consists of deeply dissected, broad ridgetops and side slopes on uplands. The ridgetops are gently sloping and strongly sloping, and the side slopes are moderately steep and steep.

This map unit makes up about 21 percent of the county. It is about 52 percent Hayesville soils, 23 percent Ashe soils, and 14 percent Chester soils. Soils of minor extent make up about 11 percent.

The Hayesville soils are mainly on broad ridgetops and side slopes and are deep and well drained. They have a strong brown loam surface layer and a red clay subsoil.

The Ashe soils are mostly on side slopes and narrow ridgetops and are moderately deep and somewhat excessively drained. They have a dark brown loam surface layer and a strong brown loam subsoil.

The Chester soils are on broad to narrow ridgetops and side slopes and are deep and well drained. They have a dark brown loam surface layer and a yellowish red clay loam subsoil.

Of minor extent in this map unit are the well drained Cullen soils on ridgetops and side slopes on uplands, the excessively drained Parker soils on side slopes, the well drained Braddock and Thurmont soils on colluvial ridges and side slopes, and the well drained Hiwassee and Masada soils on high stream terraces. Also of minor extent are the moderately well drained Dogue soils, the well drained McQueen soils, and the somewhat poorly drained Wahee soils on low stream terraces. The somewhat poorly drained Belvoir soils, the moderately well drained to well drained Meadowville soils, and the poorly drained Worsham soils are on foot slopes and toe slopes at the heads of drainageways and along streams. The excessively drained Buncombe soils, the somewhat poorly drained Chewacla soils, the well drained Riverview and Toccoa soils, and the poorly drained Wehadkee soils are on flood plains.

About half of the acreage of this map unit has been cleared. It is used for cropland and pasture. The rest is woodland and Urban land.

The gently sloping soils are well suited to cultivated crops, hay and pasture. The strongly sloping soils are well suited to pasture and moderately well suited to cultivated crops and hay. Major management concerns are the hazard of erosion, maintaining or increasing organic matter in the surface layer, and increasing the fertility of the soil.

The soils in this map unit are suited to trees. Potential productivity for trees is moderately high to high. The soils are managed for mixed hardwoods and pines. Erosion is a hazard along logging roads and skid trails on the steeper slopes.

This map unit is limited for nonfarm uses. The moderately permeable clayey subsoil and depth to rock are limitations for sanitary facilities and building site development.

## 5. Elioak-Hazel-Glenelg

*Deep and moderately deep, well drained and excessively drained soils that have a clayey or loamy subsoil; formed in material weathered from quartz mica schist*

This map unit consists of gently sloping and strongly sloping, narrow ridgetops and side slopes and moderately steep and steep areas adjacent to streams.

This map unit makes up about 17 percent of the county. It is about 22 percent Elioak soils, 18 percent Hazel soils, and 15 percent Glenelg soils. Soils of minor extent make up about 45 percent.

The Elioak soils are deep, well drained, and gently sloping to moderately steep. They are on the highest positions on narrow ridgetops. They have a dark brown loam surface layer and a red silty clay subsoil.

The Hazel soils are moderately deep, excessively drained, and strongly sloping to steep. They are on slopes leading down to drainageways. They have a brown loam surface layer and a brown loam subsoil.

The Glenelg soils are deep, well drained, and gently sloping to steep. They are on narrow ridgetops and side slopes. They have a dark yellowish brown loam surface layer and yellowish red silty clay loam subsoil.

Of minor extent in this map unit, on broad to narrow upland ridgetops and side slopes, are the well drained Albemarle, Cullen, Culpeper, Fauquier, and Fluvanna soils and the somewhat poorly drained to moderately well drained Orange soils. On upland side slopes and narrow ridgetops are the well drained to excessively drained Louisburg soils, the well drained to somewhat excessively drained Manor soils, and the somewhat excessively drained Watt soils. The well drained Hiwassee and Turbeville soils are on high stream terraces. The moderately well drained Dogue soils and somewhat poorly drained Wahee soils are on low stream terraces. The excessively drained Buncombe soils, the somewhat poorly drained Chewacla soils, the well drained Riverview and Toccoa soils, and the poorly drained Wehadkee soils are on flood plains.

About one-fourth of the acreage of this map unit has been cleared. It is used for cropland and pasture. Most of the rest is in woodland; a small portion is in Urban land.

The gently sloping soils are well suited to cultivated crops, hay, and pasture. The strongly sloping soils are well suited to pasture and moderately well suited to cultivated crops and hay. Major management concerns are the hazard of erosion, maintaining or increasing organic matter of the surface layer, and increasing the fertility of the soil.

The soils of this map unit are suited to trees. Potential productivity for trees is moderate to high. The soils are managed mostly for loblolly pine. Erosion is a hazard along logging roads and skid trails on the steeper slopes.

This map unit is limited for nonfarm uses. The moderately permeable clayey subsoil and the depth to rock are limitations for sanitary facilities and building site development.

## 6. Rabun-Myersville-Catoctin

*Deep and moderately deep, well drained soils that have a clayey or loamy subsoil; formed in material weathered from greenstone*

This map unit consists of a low mountain range that is gently sloping to steep. Much of the area is mountainsides facing east or west. At the base of these small mountains are gently sloping and sloping ridges and side slopes.

This map unit makes up about 15 percent of the county. It is about 40 percent Rabun soils, 22 percent Myersville soils, and 11 percent Catoctin soils. Soils of minor extent make up about 27 percent.

The Rabun soils are mainly on gently sloping to moderately steep positions but are on steep positions in

small areas. These soils are on the lower positions of the mountains and at the base of the low mountains. They are deep and well drained and have a dark reddish brown clay loam or clay surface layer and a dark red clay subsoil. Some areas have a very stony surface.

The Myersville soils are on narrow ridges and side slopes leading down toward drainageways. They are gently sloping to steep. Some areas on steep slopes have a very stony surface. The Myersville soils are deep and well drained and have a brown silt loam surface layer and a yellowish red silty clay loam subsoil.

The Catoclin soils are on moderately steep and steep side slopes and sides of mountains. They are on the steepest positions in mapped areas. Some areas have a very stony surface. The Catoclin soils are moderately deep and well drained and have a dark yellowish brown silt loam surface layer and a strong brown channery silt loam subsoil.

Of minor extent in this map unit are the well drained Davidson and Fauquier soils on broad ridgetops and side slopes and the well drained Dyke and Unison soils on old colluvial ridges and side slopes. Also of minor extent are the moderately well drained to somewhat poorly drained Mount Lucas soils and well drained Starr soils in upland depressions, on concave lower slopes, and along small drainageways.

About half of the acreage of this map unit is used for cropland and pasture. The rest is in woodland.

The gently sloping soils are well suited to cultivated crops, hay, and pasture. The strongly sloping soils are moderately well suited to cultivated crops and hay and well suited to pasture. Major management concerns are the hazard of erosion, maintaining or increasing organic matter in the surface layer, and applying lime and fertilizer according to soil tests to offset the acidity and increase the fertility of the soil.

The soils in this map unit are well suited to trees. Potential productivity for trees ranges from moderate to very high. The soils are managed mostly for mixed hardwoods. Erosion is a hazard along logging roads and skid trails on the steeper slopes.

This map unit is limited for nonfarm uses. The moderately permeable, clayey subsoil and depth to rock are limitations for sanitary facilities and building site development.

## 7. Manteo-Nason-Tatum

*Shallow and deep, somewhat excessively drained and well drained soils that have a loamy or clayey subsoil; formed in material weathered from sericite-schist*

This map unit consists of wide upland ridges and side slopes. The ridges are gently sloping and strongly sloping. Some areas adjacent to streams and flood plains are moderately steep and steep.

This map unit makes up about 17 percent of the county. It is about 43 percent Manteo soils, 29 percent

Nason soils, and 6 percent Tatum soils. Soils of minor extent make up about 22 percent.

The Manteo soils are mainly on moderately steep and steep side slopes. They are shallow and somewhat excessively drained. The Manteo soils have a brown channery or very channery silt loam surface layer and a yellowish brown very channery silt loam subsoil.

The Nason soils are on broad gently sloping ridges and strongly sloping and moderately steep side slopes. They are deep and well drained. The Nason soils have a yellowish brown silt loam surface layer and a yellowish red silty clay subsoil.

The Tatum soils are on gently sloping ridges and strongly sloping side slopes. They are deep and well drained. The Tatum soils have a yellowish brown silt loam surface layer and a red clay subsoil.

Of minor extent in this map unit are the well drained Cullen and Fluvanna soils and the somewhat poorly drained to moderately well drained Orange soils on upland ridges, side slopes, and broad, gently sloping, low lying areas. The well drained Hiwassee, Masada, and Turbeville soils are on high stream terraces, and the moderately well drained Dogue soils, well drained McQueen soils, and somewhat poorly drained Wahee soils are on low stream terraces. The moderately well drained to well drained Abell soils, moderately well drained to somewhat poorly drained Lignum soils, and poorly drained Worsham soils are on foot slopes and toe slopes, in upland depressions, and along small drainageways. The excessively drained Buncombe soils, somewhat poorly drained Chewacla soils, well drained Riverview and Toccoa soils, and poorly drained Wehadkee soils are on flood plains.

About one-fourth of the acreage of this map unit is used for cropland and pasture. The rest is in woodland.

Most of this map unit is poorly suited or not suited to cultivated crops and hay. Some of the gently sloping soils are well suited to cultivated crops, hay, and pasture. The strongly sloping soils are mostly not suited to cultivated crops, but some areas are moderately well suited to cultivated crops and hay and moderately well suited or well suited to pasture. Major management concerns are the hazard of erosion, maintaining or increasing organic matter in the surface layer, and increasing the fertility of the soil.

The soils in this map unit are moderately well suited to trees. Potential productivity for trees ranges from moderate to moderately high. The soils are managed mostly for loblolly pine. Erosion is a hazard along logging roads and skid trails on the steeper slopes.

This map unit is limited for nonfarm uses. The shallow depth to bedrock and the moderately permeable clayey subsoil are limitations for sanitary facilities and building site development.

## 8. Totier-Klinesville-Rapidan

*Deep and shallow, well drained soils that have a clayey or loamy subsoil; formed in material weathered from red shale and conglomerate*

This map unit consists of gently sloping to moderately steep soils on Piedmont uplands known as the Triassic Basin. Much of the area is gently sloping broad upland ridges. Side slopes leading down toward drainageways are strongly sloping or moderately steep.

This map unit makes up about 5 percent of the county. It is about 25 percent Totier soils, 15 percent Klinesville soils, and 14 percent Rapidan soils. Soils of minor extent make up about 46 percent.

The Totier soils are mainly on gently sloping broad ridgetops and strongly sloping side slopes. They are deep and have a reddish brown silt loam surface layer and a red clay subsoil.

The Klinesville soils are mainly on strongly sloping and moderately steep side slopes. They are shallow and have a reddish brown channery silt loam surface layer and a dark red very channery silt loam subsoil.

The Rapidan soils are mainly on gently sloping ridges and strongly sloping side slopes. They are deep and have a dark reddish brown silt loam surface layer and a dark red clay subsoil.

Of minor extent in this map unit are the well drained Bermudian soils and the moderately well drained Rowland soils on flood plains. The well drained to

moderately well drained Manassas soils are on foot slopes, in upland depressions, and along small drainageways. The well drained Mayodan soils are on gently sloping and strongly sloping side slopes. The well drained Penn soils are mostly on strongly sloping and moderately steep areas between areas of Totier and Klinesville soils. The moderately well drained and somewhat poorly drained Creedmoor soils are on upland flats, along drainageways, and on toe slopes.

More than three-fourths of the acreage of this map unit is used for cropland and pasture. The rest is in woodland.

The gently sloping soils are well suited to cultivated crops, hay, and pasture. The strongly sloping soils are moderately well suited to cultivated crops and hay and well suited to pasture. Major management concerns are the hazard of erosion, maintaining or increasing organic matter in the surface layer, and increasing fertility of the soil.

The soils in this map unit are suited to trees. Potential productivity for trees is moderate or high. The soils are managed for mixed hardwoods and pines. Erosion is a hazard along logging roads and skid trails on the steeper slopes.

This map unit is limited for nonfarm uses. The moderately permeable, clayey subsoil and the depth to rock are limitations for sanitary facilities and building site development.

## Detailed Soil Map Units

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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, Hayesville loam, 2 to 7 percent slopes, is one of several phases in the Hayesville series.

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

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. Myersville-Catoctin very stony silt loams, 7 to 15 percent slopes, 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, quarry 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.

**1B—Abell silt loam, 2 to 7 percent slopes.** This deep, gently sloping, moderately well drained soil is along drainageways, on foot slopes, and in depressions. Slopes commonly are slightly concave and about 200 to 500 feet long. Areas of this soil are long and narrow and range from 3 to about 15 acres.

Typically, the surface layer of this soil is dark grayish brown and light yellowish brown silt loam about 12 inches thick. The subsoil is about 24 inches thick. It is mostly yellowish brown clay loam and has gray mottles below a depth of about 28 inches. Commonly, a thin gravel line is in the lower part of the subsoil. The substratum, to a depth of 60 inches or more, is multicolored loam and weathered bedrock.

Included with this soil in mapping are small areas of moderately well drained to somewhat poorly drained Lignum soils and poorly drained Worsham soils. The Lignum and Worsham soils are along drainageways and in depressions. Also included are small areas of soils that have a gravelly surface layer. Included soils make up about 20 percent of mapped areas.

Permeability is moderate, and available water capacity is high. Surface runoff is medium. The hazard of erosion is moderate. This soil has good tilth. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 36 inches or more. The natural fertility and the organic matter content are low. This soil commonly is strongly acid to very strongly acid throughout, but reaction in the surface layer is variable because of local liming. A seasonal high water table is at a depth of 2 to 3 1/2 feet during winter and early in spring.

Most areas of this soil are used for pasture or woodland. Some areas are cultivated.

This soil is well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. The soil is wet and cold in spring, and wetness commonly interferes with tillage. In places, crops are damaged by ponded water after heavy rains. Drainage and control of ponded water help to alleviate wetness and crop damage. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter and tilth, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is wet causes compaction of the surface soil and damages the stand of grasses and legumes.

Potential productivity for trees on this soil is high, especially for loblolly pine, yellow-poplar, and black walnut. Seeds and seedlings survive and grow well if competing vegetation is controlled.

The seasonal high water table, low strength, and moderate shrink-swell potential are the main limitations for nonfarm uses. The seasonal high water table limits use of the soil as a building site, as a site for sanitary landfills, and for septic tank absorption fields. Low strength limits use of the soil for local roads and streets. The low strength and excess fines limit its use as a source of roadfill.

This soil is in capability subclass IIw.

**2B—Albemarle fine sandy loam, 2 to 7 percent slopes.** This deep, gently sloping, well drained soil is on convex ridgetops that are about 200 to 800 feet wide. Areas of this soil commonly are long and winding. They range from 5 to about 30 acres.

Typically, the surface layer of this soil is very dark grayish brown and brownish yellow fine sandy loam about 5 inches thick. The subsoil is mostly strong brown and yellowish red clay loam about 25 inches thick. The substratum is mostly yellowish brown, light gray, and yellow sandy loam. Hard rock is at a depth of 50 inches.

Included with this soil in mapping are small areas of well drained Culpeper and Elioak soils, excessively drained Hazel soils, and well drained to excessively drained Louisburg soils. The Culpeper and Elioak soils are mainly on broad, flat ridges but can be on other positions. The Hazel and Louisburg soils are mainly on the points of ridges and on side slopes. Also included are small areas of soils that have a gravelly surface layer and severely eroded soils that have a surface layer of yellowish red clay loam. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is medium. The hazard of erosion is moderate. This soil has good tilth. The subsoil has low shrink-swell potential. The root zone extends to a depth of 30 inches or more. Natural fertility and organic matter content are low. This soil is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Depth to bedrock is 40 to 60 inches or more.

Most areas of this soil are in woodland. Some areas are farmed.

This soil is well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil.

The depth to bedrock and the moderately permeable subsoil are the main limitations for nonfarm uses. The depth to bedrock and seepage limit use of the soil for most sanitary facilities. Seepage is a limitation for sewage lagoons and sanitary landfills. The low strength and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass IIe.

**2C—Albemarle fine sandy loam, 7 to 15 percent slopes.** This deep, strongly sloping, well drained soil is on convex ridgetops and side slopes that are about 100 to 500 feet wide. Areas of this soil commonly are long and winding. They range from 5 to about 30 acres.

Typically, the surface layer of this soil is very dark grayish brown and brownish yellow fine sandy loam about 5 inches thick. The subsoil is mostly strong brown and yellowish red clay loam about 25 inches thick. The substratum is mostly yellowish brown, gray, and yellow sandy loam. Hard rock is at a depth of 50 inches.

Included with this soil in mapping are small areas of well drained Culpeper and Glenelg soils, excessively drained Hazel soils, and well drained to excessively drained Louisburg soils. The Culpeper and Elioak soils are mainly on the less steep positions but can also be on other positions. The Hazel and Louisburg soils are mainly on the points of ridges and on side slopes. Also included are small areas of soils that have a gravelly

surface layer and severely eroded soils that have a surface layer of yellowish red clay loam. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. The surface layer is friable and is easily tilled. The subsoil has low shrink-swell potential. The root zone extends to a depth of 30 inches or more. Natural fertility and organic matter content are low. This soil commonly is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Depth to bedrock is 40 to 60 inches.

Most areas of this soil are in woodland. Some areas are farmed.

This soil is moderately well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil.

The slope, depth to bedrock, and the moderately permeable subsoil are the main limitations for nonfarm uses. Depth to bedrock and the slope limit use of the soil as a building site. The slope, depth to bedrock, and seepage limit use of the soil for sanitary facilities. The low strength and excess fines limit its use as a source of roadfill.

This soil is in capability subclass IIIe.

**2D—Albemarle fine sandy loam, 15 to 25 percent slopes.** This deep, moderately steep, well drained soil is on side slopes that are about 100 to 500 feet wide. Areas of this soil commonly are long and winding. They range from 5 to about 30 acres.

Typically, the surface layer of this soil is very dark grayish brown and brownish yellow fine sandy loam about 5 inches thick. The subsoil is mostly strong brown and yellowish red clay loam about 25 inches thick. The substratum is mostly yellowish brown, light gray, and yellow sandy loam. Hard rock is at a depth of 50 inches.

Included with this soil in mapping are small areas of well drained Culpeper and Glenelg soils, excessively drained Hazel soils, and well drained to excessively drained Louisburg soils. The Culpeper and Glenelg soils

are on landscape positions similar to this Albemarle soil. The Hazel and Louisburg soils are mainly on the steeper positions. Also included are small areas of soils that have a gravelly surface layer and severely eroded soils that have a surface layer of yellowish red clay loam. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. The surface layer is friable and is easily tilled. The subsoil has low shrink-swell potential. The root zone extends to a depth of 30 inches or more. Natural fertility and the organic matter content are low. This soil commonly is strongly acid to very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Depth to bedrock is more than 40 inches.

Most areas of this soil are in woodland. Some areas are farmed.

This soil is poorly suited to cultivated crops. The severe erosion hazard is a major management concern. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil.

The slope and depth to bedrock are the main limitations for nonfarm uses. The slope limits use of the soil as a building site. The slope, depth to rock, and seepage limit use of the soil for sanitary facilities. The low strength and excess fines limit its use as a source of roadfill.

This soil is in capability subclass IVe.

**3C—Albemarle very stony fine sandy loam, 7 to 15 percent slopes.** This deep, strongly sloping, well drained soil is on convex ridgetops and side slopes that are about 200 to 500 feet wide. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Areas of this soil commonly are long and winding. They range from 5 to about 30 acres.

Typically, the surface layer of this soil is very dark grayish brown and brownish yellow fine sandy loam about 5 inches thick. The subsoil is mostly strong brown

and yellowish red clay loam about 25 inches thick. The substratum is mostly yellowish brown, light gray, and yellow sandy loam. Hard rock is at a depth of 50 inches.

Included with this soil in mapping are small areas of well drained Culpeper soils, excessively drained Hazel soils, and well drained to excessively drained Louisburg soils. The Culpeper soils are mainly on the less steep positions. The Hazel and Louisburg soils are mainly on points of ridges and the steeper side slopes. Also included are small areas of soils that do not have stones on the surface and soils that have slopes of less than 7 percent. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of 30 inches or more. Natural fertility and organic matter content are low. This soil commonly is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Depth to bedrock is more than 40 inches.

Most areas of this soil are in woodland. Some areas are in permanent pasture.

This soil is not suited to cultivated crops. The stones on the surface make use of tillage equipment impractical.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil.

Low strength, slope, depth to bedrock, and a moderately permeable subsoil are the main limitations for nonfarm uses. The low strength, slope, and depth to bedrock limit use of the soil as a building site. The slope, depth to bedrock, and seepage limit its use for sanitary facilities. The low strength and excess fines limit its use as a source of roadfill.

This soil is in capability subclass VIs.

**3D—Albemarle very stony fine sandy loam, 15 to 25 percent slopes.** This deep, moderately steep, well drained soil is on side slopes that are about 200 to 500 feet wide. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Areas of this soil commonly are long and winding. They range from 5 to about 30 acres.

Typically, the surface layer of this soil is very dark grayish brown and brownish yellow fine sandy loam about 5 inches thick. The subsoil is mostly strong brown and yellowish red clay loam about 25 inches thick. The

substratum is mostly yellowish brown, light gray, and yellow sandy loam. Hard rock is at a depth of 50 inches.

Included with this soil in mapping are small areas of well drained Culpeper soils, excessively drained Hazel soils, and well drained to excessively drained Louisburg soils. The Culpeper soils are mainly on the steeper positions. The Hazel and Louisburg soils are mainly on the less steep positions. Also included are small areas of soils that do not have stones on the surface and soils that have slopes of more than 25 percent. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of 30 inches or more. The organic matter content and the natural fertility are low. The soil commonly is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Depth to bedrock is more than 40 inches.

Most areas of this soil are in woodland. Some areas are in permanent pasture.

This soil is not suited to hay and cultivated crops. The stones on the surface make the use of equipment impractical.

This soil is moderately well suited to pasture. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil.

Slope, depth to rock, and a moderately permeable subsoil are the main limitations for nonfarm uses. Slope limits use of the soil as a building site. The slope, depth to bedrock, and seepage limit its use for sanitary facilities. Low strength and excess fines limit its use as a source of roadfill.

This soil is in capability subclass VIs.

**3E—Albemarle very stony fine sandy loam, 25 to 45 percent slopes.** This deep, steep, well drained soil is on side slopes that are about 200 to 500 feet wide. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Areas of this soil commonly are long and winding. They range from 5 to about 50 acres.

Typically, the surface layer of this soil is very dark grayish brown and brownish yellow fine sandy loam about 5 inches thick. The subsoil is mostly strong brown and yellowish red clay loam about 25 inches thick. The substratum is mostly yellowish brown, light gray, and yellow sandy loam. Hard rock is at a depth of 50 inches.

Included with this soil in mapping are small areas of excessively drained Hazel soils and well drained to excessively drained Louisburg soils. The Hazel and Louisburg soils are on the same landscape positions as this Albemarle soil. Also included are small areas of soils that do not have stones on the surface and soils that have slopes of less than 25 percent. Included soils make up about 25 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is very rapid. The hazard of erosion is very severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of 30 inches or more. The organic matter content and natural fertility are low. This soil commonly is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Depth to bedrock is more than 40 inches.

Most areas of this soil are in woodland. A few areas are in permanent pasture.

This soil is not suited to hay and cultivated crops. The stones on the surface and steep slopes make the use of equipment impractical.

This soil is poorly suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil.

Slope, depth to bedrock, and a moderately permeable subsoil are the main limitations for nonfarm uses. The slope limits use of the soil as a building site. The slope, depth to bedrock, and seepage limit its use for sanitary facilities. Slope and excess fines limit its use as a source of roadfill.

This soil is in capability subclass VII<sub>s</sub>.

**4B—Ashe loam, 2 to 7 percent slopes.** This moderately deep, gently sloping, somewhat excessively drained soil is on convex ridgetops and on points of ridges. Areas of this soil are irregularly oblong. They range from 5 to about 15 acres.

Typically, the surface layer of this soil is dark brown and brown loam about 10 inches thick. The subsoil is strong brown loam about 9 inches thick. The substratum is multicolored brown, yellow, white, and black partially weathered bedrock that crushes to sandy loam to a depth of about 50 inches. Bedrock is at a depth of 50 inches.

Included with this soil in mapping are small areas of well drained Chester and Porters soils. These soils are scattered throughout the mapped area. Also included are small areas of soils that have a very gravelly or very

stony surface layer and areas that have outcrops of rock. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability of this soil is moderately rapid, and available water capacity is low. Surface runoff is medium. The hazard of erosion is moderate. The surface layer is friable, and tilth is fair through a wide range of soil moisture. The subsoil has low shrink-swell potential. The root zone extends to a depth of about 30 inches. The organic matter content is low to moderate, and natural fertility is low. The soil is strongly acid or very strongly acid throughout, but reaction is variable because of local liming. Bedrock is generally at a depth of more than 48 inches.

Most areas of this soil are in woodland or in pasture.

This soil is moderately well suited to cultivated crops. The soil is droughty during the growing season, and response to lime and fertilizer is limited by the low available water capacity. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high, especially for loblolly pine and Virginia pine. The survival of seeds and seedlings is affected by drought during the growing season. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion.

The moderately rapid permeability and the depth to bedrock are the main limitations for nonfarm uses. These limit use of the soil as a building site and as a site for sanitary facilities. Slope is a limitation for playgrounds. The soil is a poor source of roadfill.

This soil is in capability subclass III<sub>e</sub>.

**4C—Ashe loam, 7 to 15 percent slopes.** This moderately deep, strongly sloping, somewhat excessively drained soil is on convex ridgetops, on points of ridges, and on side slopes. Areas of this soil are irregularly oblong. They range from 5 to about 30 acres.

Typically, the surface layer of this soil is dark brown and brown loam about 10 inches thick. The subsoil is strong brown loam about 9 inches thick. The substratum is multicolored brown, yellow, white, and black partially weathered bedrock that crushes to sandy loam to a depth of about 50 inches. Bedrock is at a depth of 50 inches.

Included with this soil in mapping are small areas of well drained Chester and Porters soils and excessively drained Parker soils. These soils are scattered throughout the mapped area. Also included are small areas of soils that have a very gravelly or very stony surface layer and areas that have outcrops of rock. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability of this soil is moderately rapid, and available water capacity is low. Surface runoff is rapid. The hazard of erosion is severe. The surface layer is friable, and tilth is fair through a wide range of soil moisture. The subsoil has low shrink-swell potential. The root zone extends to a depth of about 30 inches. The organic matter content is low to moderate, and the natural fertility is low. This soil is strongly acid or very strongly acid throughout, but reaction is variable because of local liming. Bedrock is generally at a depth of more than 48 inches.

Most areas of this soil are in woodland or pasture.

This soil is poorly suited to cultivated crops. It is droughty during the growing season, and response to lime and fertilizer is limited by the low available water capacity. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high, especially for loblolly pine and Virginia pine. The survival of seeds and seedlings is affected by drought during the growing season. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion.

Slope, moderately rapid permeability, and depth to bedrock are the main limitations for nonfarm uses. These limit the use of the soil as a building site and as a site for sanitary facilities. Slope is a limitation for recreational areas. This soil is a poor source of roadfill.

This soil is in capability subclass IVe.

**4D—Ashe loam, 15 to 25 percent slopes.** This moderately deep, moderately steep, somewhat excessively drained soil is on narrow convex ridgetops, on points of ridges, and on side slopes. Areas of this soil are slightly elongated or wide and winding. They range from 10 to about 50 acres.

Typically, the surface layer of this soil is dark brown and brown loam about 10 inches thick. The subsoil is

strong brown loam about 9 inches thick. The substratum is multicolored brown, yellow, white, and black partially weathered bedrock that crushes to sandy loam to a depth of about 50 inches. Bedrock is at a depth of about 50 inches.

Included with this soil in mapping are small areas of well drained Chester and Porters soils and excessively drained Parker soils. These soils are scattered throughout the mapped area. Also included are small areas of soils that have a very gravelly or very stony surface layer and areas that have outcrops of rock. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability of this soil is moderately rapid, and the available water capacity is low. Surface runoff is rapid. The hazard of erosion is severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of about 30 inches. The organic matter content is low to moderate, and natural fertility is low. This soil is strongly acid or very strongly acid throughout, but reaction is variable because of local liming. Bedrock is generally at a depth of more than 48 inches.

Most areas of this soil are in woodland or pasture.

This soil is not suited to cultivated crops. It is droughty during the growing season, and response to lime and fertilizer is limited by the low available water capacity.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high, especially for loblolly pine and Virginia pine. The survival of seeds and seedlings is affected by drought during the growing season. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits safe operation of heavy equipment.

Slope, moderately rapid permeability, and depth to rock are the main limitations for nonfarm uses. These limit the use of the soil as a building site and as a site for most sanitary facilities. Slope is a limitation for recreational development. The soil is a poor source of roadfill.

This soil is in capability subclass VIe.

**4E—Ashe loam, 25 to 45 percent slopes.** This moderately deep, steep, somewhat excessively drained soil is on points of ridges and on side slopes. Areas of this soil are slightly elongated or wide and winding. They range from 15 to about 100 acres.

Typically, the surface layer of this soil is dark brown and brown loam about 10 inches thick. The subsoil is strong brown loam about 9 inches thick. The substratum

is multicolored brown, yellow, white, and black partially weathered bedrock that crushes to sandy loam to a depth of about 50 inches. Bedrock is at a depth of 50 inches.

Included with this soil in mapping are small scattered areas of well drained Chester and Porters soils and excessively drained Parker soils. Also included are small areas of soils that have a very gravelly or very stony surface layer and areas that have outcrops of rock. The included soils and outcrops make up about 25 percent of mapped areas.

Permeability of this soil is moderately rapid, and available water capacity is low. Surface runoff is very rapid. The hazard of erosion is very severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of about 30 inches. The organic matter content is low to moderate, and the natural fertility is low. This soil is strongly acid or very strongly acid throughout, unless limed. Bedrock is generally at a depth of more than 48 inches.

Most areas of this soil are in woodland.

This soil is not suited to hay or cultivated crops. Steep slopes make use of modern tillage equipment impractical. The soil is droughty during the growing season.

This soil is poorly suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high, especially for loblolly pine and Virginia pine. The survival of seeds and seedlings is affected by drought during the growing season. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. Slope limits safe operation of heavy equipment.

Slope and depth to rock are the main limitations for nonfarm uses. These limit use of the soil as a building site and as a site for most sanitary facilities. Slope is a limitation for recreational development. This soil is a poor source of roadfill.

This soil is in capability subclass VIIe.

**5B—Belvoir loam, 2 to 7 percent slopes.** This deep, gently sloping, somewhat poorly drained soil is on saddles, in depressions, on foot slopes, and along small drainageways. Areas of this soil are elongated, irregularly oval, or rectangular. They range from 3 to about 20 acres.

Typically, the surface layer of this soil is dark grayish brown and light yellowish brown loam about 12 inches thick. The upper part of the subsoil is brownish yellow loam about 7 inches thick with light brownish gray mottles. Next is a brittle, compact fragipan of brownish

yellow sandy loam that is about 6 inches thick and has light brownish gray mottles. The lower 20 inches of the subsoil is yellowish brown clay loam that has light gray mottles. The substratum is gray, reddish yellow, and yellowish brown clay and clay loam to a depth of 72 inches or more.

Included with this soil in mapping are small areas of well drained to moderately well drained Meadowville soils, well drained Thurmont soils, and poorly drained Worsham soils. The Meadowville and Thurmont soils are on the higher positions. The Worsham soils are along small drainageways and on toe slopes. Also included are small areas of soils that do not have a fragipan and soils that have slopes of more than 7 percent. Included soils make up about 20 percent of mapped areas.

Permeability of this soil is slow, and available water capacity is moderate. Surface runoff is medium. The hazard of erosion is moderate. This soil has good tilth. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of about 25 inches, where root growth is severely restricted by the brittle compact layer. The organic matter content and natural fertility are low. The surface layer and subsoil commonly are strongly acid or very strongly acid, but reaction in the surface layer is variable because of local liming. A seasonal high water table is at a depth of 1 foot to 2 feet during winter and early in spring. Depth to bedrock is more than 5 feet.

Most areas of this soil are in woodland or pasture.

This soil is moderately well suited to cultivated crops. Deep-rooted crops commonly are stunted or short lived because of the restricted rooting depth. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is wet causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, yellow-poplar, sweetgum, and oaks do moderately well on this soil. The soil is soft when wet, limiting the use of heavy equipment. Windthrow causes some losses when the soil is wet because of the limited rooting depth above the brittle compact layer.

The shallow depth to the seasonal high water table and the slowly permeable subsoil are the main limitations for nonfarm uses. The seasonal high water table limits use of the soil as a site for most sanitary facilities. Many

of the areas dry out slowly in spring and after heavy rains. The slowly permeable subsoil limits use of the soil for septic tank absorption fields and picnic areas. The soil is a fair source of roadfill.

This soil is in capability subclass IIIw.

**6—Bermudian silt loam.** This deep, nearly level, well drained soil is on flood plains along the rivers and large streams. Areas of this soil commonly are elongated and along the course of the adjacent stream. They range from about 5 to 30 acres.

Typically, the surface layer is dark reddish brown silt loam about 4 inches thick. The subsoil is 41 inches thick. The upper 35 inches is dark reddish brown and reddish brown silt loam and silty clay loam. The lower 6 inches of the subsoil is reddish brown clay loam and sandy clay loam. The substratum to a depth of 60 inches is yellowish red extremely gravelly silt loam.

Included with this soil in mapping are small intermingled areas, generally less than 3 acres, of well drained to moderately well drained Manassas soils, moderately well drained to somewhat poorly drained Rowland soils, and poorly drained Wehadkee soils. The Manassas soils are on the higher positions, generally away from the stream, and on foot slopes. The Rowland and Wehadkee soils are in depressions and on flats generally away from the adjacent stream or river at the base of upland side slopes. Also included in abandoned stream channels are small areas of soil that have a very gravelly surface. Included soils make up about 15 percent of mapped areas.

Permeability of this soil is moderate to moderately rapid, and available water capacity is moderate. Runoff is slow, and the hazard of erosion is slight. This soil has good tilth. The natural fertility is medium, and the organic matter content is moderate. The subsoil has low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and subsoil commonly are medium acid, unless lime has been applied. Bedrock is generally at a depth of more than 5 feet and is not usually a factor in the use of this soil. During winter and early in spring the soil is occasionally flooded for brief periods and the seasonal high water table is between depths of 3 and 6 feet.

Many areas of this soil are in cultivated cropland. Some areas are in hay or pasture.

This soil is well suited to cultivated crops. The hazard of erosion is slight and is not a major management concern. Management concerns are the need to increase organic matter content and the use of lime and fertilizer according to soil tests. If this soil is cultivated, conservation tillage, use of cover crops, and including grasses and legumes in the cropping system increase the organic matter content and help to maintain tilth. Crop residue should be kept on or near the surface.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and

legumes and overgrazing are major pasture management concerns. Proper stocking rates to maintain desirable grasses and legumes, controlled grazing, and use of lime and fertilizer according to soil tests are useful in pasture management.

Potential productivity for trees on this soil is very high. The soil is managed mostly for hardwoods. Seeds and seedlings survive and grow well on this soil.

The flooding is a main limitation for nonfarm uses of this soil. It limits the use of the soil for most sanitary facilities, building sites, and recreational areas. The low strength and excess fines limit the soil as a source of roadfill.

This soil is in capability class I.

**7B—Braddock loam, 2 to 7 percent slopes.** This soil is deep, gently sloping, and well drained. It is on narrow to broad convex ridgetops. Areas of this soil are 100 to 500 feet wide and are elongated along the ridge or are highly variable in shape. They range from about 10 to 25 acres.

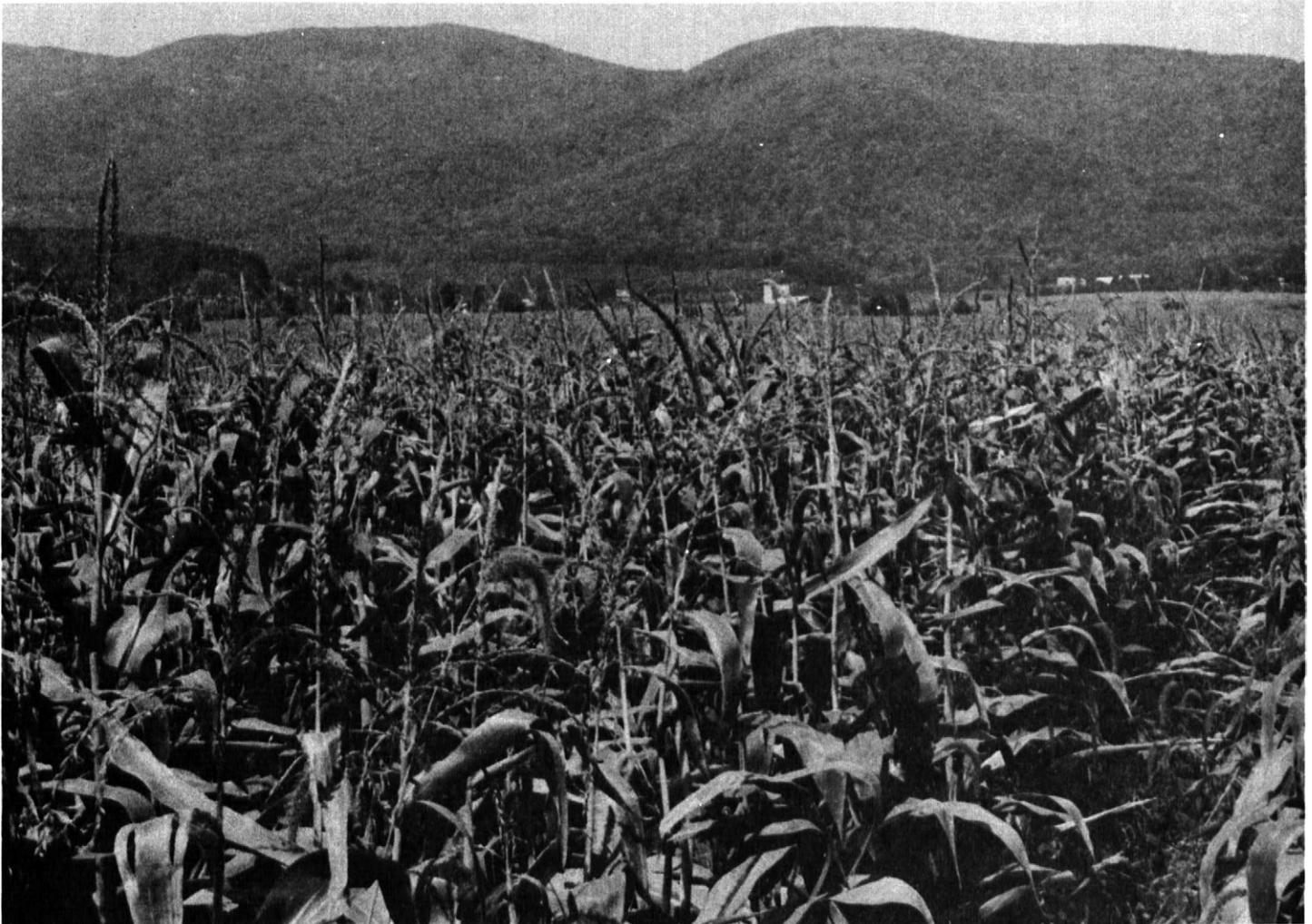
Typically, the surface layer of this soil is brown loam about 8 inches thick. The subsoil is about 52 inches thick. It is yellowish red clay loam and red clay in the upper part and below that, between depths of 40 and 60 inches, is red clay loam with strong brown mottles.

Included with this soil in mapping are small areas of well drained Hayesville and Thurmont soils and moderately well drained to well drained Meadowville soils. The Hayesville and Thurmont soils commonly are intermingled on the same landscape positions as this Braddock soil. The Meadowville soils are in shallow depressions and along drainageways. Also included are small areas of soils that have slopes of more than 7 percent and severely eroded soils that have a clay loam surface layer. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is medium. The hazard of erosion is moderate. This soil has fair tilth. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content is low, and the natural fertility is medium. The soil commonly is very strongly acid or strongly acid, unless limed. Bedrock is generally at a depth of more than 60 inches.

Most areas of this soil are farmed. A few areas are in permanent pasture or woodland.

This soil is well suited to cultivated crops (fig. 2). When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, using cover crops and grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and control erosion. Increasing the organic matter content of this soil improves tilth, infiltration, and fertility. It also reduces crusting and improves soil-seed contact.



**Figure 2.—Corn on Braddock loam, 2 to 7 percent slopes, in foreground. Catoctin, Lew, and Myersville soils on the mountain slopes in background.**

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface layer, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is high, especially for yellow-poplar, oaks, and pines. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, mowing, and girdling.

This soil is limited for most nonfarm uses. The moderately permeable clayey subsoil and seepage are limitations for sanitary facilities. The clayey subsoil and shrink-swell potential are limitations for most building sites. This soil is well suited to lawns, landscaping, and golf fairways. It is well suited to recreational development. Slope limits its use for playgrounds. Low strength and excess fines limit its use as a source of roadfill. This soil is good for use as openland and woodland wildlife habitats.

This soil is in capability subclass IIe.

**7C—Braddock loam, 7 to 15 percent slopes.** This soil is deep, strongly sloping, and well drained. It commonly is on side slopes that border small

drainageways. Areas of this soil are 100 to 500 feet wide and are irregularly elongated along the drainageways. They range from about 10 to 20 acres.

Typically, the surface layer of this soil is brown loam about 8 inches thick. The subsoil is about 52 inches thick. It is yellowish red clay loam and red clay in the upper part. The lower part of the subsoil between depths of 40 and 60 inches is red clay loam that has strong brown mottles.

Included with this soil in mapping are small areas of somewhat excessively drained Ashe soils, well drained Hayesville and Thurmont soils, and well drained to moderately well drained Meadowville soils. The Ashe, Hayesville, and Thurmont soils are commonly intermingled and on the same landscape positions as this Braddock soil. The Meadowville soils are on the less sloping positions along drainageways and in depressions. Also included are small areas of Braddock soils that have slopes of more than 15 percent. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. The surface layer is friable and easily tilled when moist, but it breaks up into clods if tilled when too wet. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content is low, and natural fertility is medium. This soil is commonly very strongly acid or strongly acid, unless limed. Bedrock is generally at a depth of more than 60 inches.

Most areas of this soil are farmed. Some areas are in permanent pasture or woodland.

This soil is moderately well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, using cover crops and grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and control erosion. Increasing the organic matter content of this soil improves tilth, infiltration, and fertility. It also reduces crusting and improves soil-seed contact.

This soil is well suited to pasture and hay crops (fig. 3). Establishing and maintaining a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface layer, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is high, especially for yellow-poplar, oaks, and pines. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, mowing, and girdling.

This soil is poorly suited to most community development. The moderately permeable clayey subsoil

and seepage are limitations for sanitary facilities. The clayey subsoil and shrink-swell potential are limitations for most building sites. This soil is fairly well suited to lawns, landscaping, and golf fairways. It is well suited to recreational development. Low strength and excess fines limit its use as a source of roadfill. Slope limits its use for playgrounds. This soil is good for use as openland and woodland wildlife habitats.

This soil is in capability subclass IIIe.

**7D—Braddock loam, 15 to 25 percent slopes.** This soil is deep, moderately steep, and well drained. It is on narrow convex side slopes and along drainageways. Areas of this soil are generally 200 to 400 feet wide and are highly variable in shape. They range from about 5 to 25 acres.

Typically, the surface layer of this soil is brown loam about 6 inches thick. The subsoil is about 52 inches thick. It is red and yellowish red clay and clay loam. The lower part of the subsoil is mottled in some pedons.

Included with this soil in mapping are small areas of well drained Chester, Hayesville, and Thurmont soils. The Chester and Thurmont soils commonly are intermingled and on the same landscape positions as this Braddock soil. The Hayesville soils are along the lower part of the side slopes. Also included are small areas of severely eroded soils and small areas of soils that are less than 40 inches thick. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. The surface layer is friable and easily tilled when moist, but it breaks up into clods if tilled when too wet or too dry. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content is low, and the natural fertility is moderate. This soil is commonly very strongly acid or strongly acid, unless limed. Bedrock is generally at a depth of more than 60 inches.

Most areas of this soil are in permanent pasture or woodland. A few areas are being farmed.

This soil is poorly suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, using cover crops and grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain the organic matter content, and control erosion. They also improve tilth, infiltration, and fertility, reduce crusting, and improve soil-seed contact.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface layer, reduces plant growth, and increases runoff and erosion.



Figure 3.—Round bales of fescue hay in an area of Braddock loam, 7 to 15 percent slopes. The grass vegetation helps reduce runoff and erosion on this strongly sloping soil.

The potential productivity for trees on this soil is high, especially for yellow-poplar, oaks, and pines. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, mowing, and girdling. Slope and erosion are the major hazards or limitations to the growing and harvesting of trees.

This soil is poorly suited to most community development. Slope, moderately permeable clayey subsoil, and seepage are limitations for sanitary facilities. The clayey subsoil and shrink-swell potential are limitations for most building sites. Because of slope, this soil is poorly suited to lawns, landscaping, and golf fairways. It is poorly suited to most recreational development. Slope limits its use for playgrounds. Low strength and excess fines limit the use of this soil as a source of roadfill. This soil is fair for use as openland wildlife habitat and good for use as woodland wildlife habitat.

This soil is in capability subclass IVe.

**8C3—Braddock clay loam, 7 to 15 percent slopes, severely eroded.** This deep, strongly sloping, well drained soil is on narrow convex ridgetops and medium to short side slopes. Areas of this soil are 100 to 400 feet wide and are irregularly elongated along the ridge. They range from about 10 to 20 acres.

Typically, the surface layer of this soil is yellowish red clay loam about 4 inches thick. The subsoil is about 48 inches thick. It is red clay and clay loam. The lower part of the subsoil is mottled in some pedons.

Included with this soil in mapping are small areas of well drained Hayesville and Thurmont soils and moderately well drained to well drained Meadowville soils. The Hayesville and Thurmont soils commonly are intermingled and on the same landscape positions as this Braddock soil. The Meadowville soils are in shallow depressions and along drainageways. Also included are

small areas of soils that are less than 40 inches thick. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe, and past erosion has reduced the range of moisture content for good workability. The surface layer is friable when moist, but it breaks up into clods if tilled when too wet. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content is low and natural fertility is medium. This soil commonly is very strongly acid or strongly acid, unless limed. Bedrock generally is at a depth of more than 60 inches.

Many areas of this soil are farmed. Some areas are in permanent pasture or woodland.

This soil is poorly suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, using cover crops, grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and control erosion. Increasing the organic matter content of this soil improves tilth, infiltration, and fertility. It also reduces crusting and improves soil-seed contact.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface layer, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is high, especially for yellow-poplar, oaks, and pines. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, mowing, and girdling.

This soil is limited for most nonfarm uses. The moderately permeable, clayey subsoil and seepage are limitations for sanitary facilities. The clayey subsoil and shrink-swell potential are limitations for most building sites. This soil is suited to lawns, landscaping, and golf fairways. Low strength and excess fines limit its use as a source of roadfill. Slope limits its use as playgrounds. This soil is good for use as openland and woodland wildlife habitats.

This soil is in capability subclass IVe.

**9B—Braddock very stony loam, 2 to 7 percent slopes.** This soil is deep, gently sloping, and well drained. It is on narrow to broad convex ridgetops. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Areas of this soil are 100 to 400 feet wide and are elongated along the ridge or are highly variable in shape. They range from about 5 to 20 acres.

Typically, the surface layer of this soil is brown loam about 8 inches thick. The subsoil is about 52 inches thick. It is yellowish red clay loam and red clay. The lower part of the subsoil is mottled with strong brown.

Included with this soil in mapping are small areas of well drained Hayesville and Thurmont soils. The Hayesville and Thurmont soils commonly are intermingled and on the same landscape positions as this Braddock soil. Also included are small areas of Braddock soils that have slopes of more than 7 percent. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is medium. The hazard of erosion is moderate. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content is low, and the natural fertility is medium. This soil commonly is very strongly acid or strongly acid, unless limed. Bedrock is generally at a depth of more than 60 inches.

Most areas of this soil are in permanent pasture or woodland.

This soil is not suited to hay and cultivated crops. The stones on the surface make the use of tillage equipment impractical.

This soil is moderately well suited to pasture crops. Establishing and maintaining a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface layer, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is high, especially for yellow-poplar, oaks, and pines. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, mowing, and girdling.

This soil is limited for most nonfarm uses. The moderately permeable, clayey subsoil and seepage are limitations for sanitary facilities. The clayey subsoil is a limitation for most building sites. The stones on the surface are limitations for lawns, landscaping, and golf fairways. Low strength and excess fines limit the use of this soil as a source of roadfill. Stoniness limits its use as playgrounds. This soil is good for use as woodland wildlife habitat.

This soil is in capability subclass VIi.

**9C—Braddock very stony loam, 7 to 15 percent slopes.** This soil is deep, strongly sloping, and well drained. It is on narrow convex ridgetops and side slopes. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Areas of this soil are 100 to 400 feet wide and are elongated along the ridge or highly variable in shape. They range from 10 to 20 acres.

Typically, the surface layer of this soil is brown loam about 8 inches thick. The subsoil is about 52 inches thick. It is yellowish red clay loam and red clay. The lower part of the subsoil is mottled with strong brown.

Included with this soil in mapping are small areas of well drained Hayesville and Thurmont soils that commonly are intermingled and on the same landscape positions as this Braddock soil. Some areas of soils have bedrock at a depth of less than 40 inches. Also included are small areas of Braddock soils that have slopes of more than 15 percent. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content is low, and the natural fertility is medium. The soil commonly is very strongly acid or strongly acid, unless limed. Bedrock is generally at a depth of more than 60 inches.

Most areas of this soil are in permanent pasture or woodland.

This soil is not suited to hay and cultivated crops. The stones on the surface make use of tillage equipment impractical.

This soil is moderately well suited to pasture crops. Establishing and maintaining a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface layer, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is high, especially for yellow-poplar, oaks, and pines. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, mowing, and girdling.

This soil is limited for most nonfarm uses. The moderately permeable, clayey subsoil and seepage are limitations for sanitary facilities. The clayey subsoil is a limitation for most building sites. The stones on the surface are limitations for lawns, landscaping, and golf fairways. Low strength and excess fines limit the use of this soil as a source of roadfill. Stoniness limits its use as playgrounds. This soil is good for use as woodland wildlife habitat.

This soil is in capability subclass VI<sub>s</sub>.

**9D—Braddock very stony loam, 15 to 25 percent slopes.** This soil is deep, moderately steep, and well drained. It is on convex side slopes. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Areas of this soil are 100 to 400 feet wide and are elongated along the drainage pattern. They range from 10 to about 20 acres.

Typically, the surface layer of this soil is brown loam about 8 inches thick. The subsoil is about 52 inches thick. It is yellowish red clay loam and red clay. The lower part of the subsoil is mottled with strong brown.

Included with this soil in mapping are small areas of somewhat excessively drained Ashe soils and well drained Hayesville and Thurmont soils. The Ashe soils are on the steeper positions and near outcrops of rock. The Hayesville and Thurmont soils commonly are intermingled and on the same landscape positions as this Braddock soil. Also included are small areas of Braddock soils that have slopes of less than 15 percent. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content is low, and the natural fertility is medium. This soil commonly is very strongly acid or strongly acid, unless limed. Bedrock is generally at a depth of more than 60 inches.

Most areas of this soil are in woodland. A few areas are in permanent pasture.

This soil is not suited to hay and cultivated crops. The stones on the surface make use of tillage equipment impractical.

This soil is moderately well suited to pasture crops. Establishing and maintaining a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface layer, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is high, especially for yellow-poplar, oaks, and pines. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, mowing, and girdling.

This soil is limited for most nonfarm uses. The moderately permeable, clayey subsoil and seepage are limitations for sanitary facilities. The clayey subsoil is a limitation for most building sites. The stones on the surface are limitations for lawns, landscaping, and golf fairways. Low strength and excess fines limit the use of this soil as a source of roadfill. Stoniness limits its use as playgrounds. This soil is good for use as woodland wildlife habitat.

This soil is in capability subclass VI<sub>s</sub>.

**10—Buncombe loamy sand.** This deep, nearly level, excessively drained soil is on flood plains along streams and large drainageways. Areas of this low-lying soil commonly are long and narrow. They range from 3 to about 20 acres. Slopes range from 0 to 2 percent.

Typically, the surface layer of this soil is dark yellowish brown loamy sand about 10 inches thick. The substratum to a depth of 60 inches is mostly brown sand and dark yellowish brown loamy sand.

Included with this soil in mapping are small areas of somewhat poorly drained Chewacla soils and well drained Riverview and Toccoa soils. The Chewacla soils are on slightly lower positions, mainly in that part of the map unit farthest from the stream. The Riverview and Toccoa soils are throughout the mapped area. Also included are small areas of gravelly soils. Included soils make up about 15 percent of mapped areas.

Permeability is rapid or very rapid, and available water capacity is low. Surface runoff is slow. The hazard of erosion is slight. This soil has good tilth. The substratum has low shrink-swell potential. The root zone extends to a depth of 60 inches or more. The organic matter content and natural fertility are low. This soil is commonly medium acid or strongly acid throughout, but reaction of the surface layer is variable because of local liming. Flooding is frequent for brief periods during the winter and spring.

Most areas of this soil are in pasture. Some areas are in woodland, and a few areas are farmed.

This soil is poorly suited to cultivated crops. The response of crops to lime and fertilizer that are applied according to soil tests is limited by the droughtiness of the soil. If the soil is not protected from flooding, crops are damaged by brief flooding during spring on an average of once every 2 years. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth, reduce crusting, and increase water infiltration.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, control of flooding, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface soil and damages stands of grasses and legumes.

Potential productivity for trees on this soil is high, especially for loblolly pine, American sycamore, yellow-poplar, and sweetgum. Seeds and seedlings survive and grow well if competing vegetation is controlled. The soil is soft, and the use of heavy equipment is limited.

Flooding, rapid permeability, and a sandy substratum are the main limitations for nonfarm uses. Flooding prevents use of the soil as a building site. Flooding, the rapid permeability, and the sandy substratum limit its use as a site for most sanitary facilities. The sandy substratum limits excavations. Flooding and the sandy substratum limit use of the soil for recreational areas. This soil is good as a source of roadfill.

This soil is in capability subclass IVw.

**11D—Cataska-Hartleton very stony loams, 15 to 25 percent slopes.** This complex consists of moderately steep, excessively drained and well drained, moderately deep and deep soils on side slopes. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Slopes are smooth and about 300 to 600 feet long. Areas of this complex are along the mountain ranges and are long and winding. They range from 20 to 50 acres or more.

This complex is about 60 percent Cataska soils and 30 percent Hartleton soils. Other soils make up the rest. The areas of individual soils are so small or so intermingled that to separate them in mapping was not practical.

Typically, the surface layer of the Cataska soil is very dark grayish brown and brown channery loam about 5 inches thick. The subsoil is yellowish brown very channery silt loam about 15 inches thick. The substratum is about 18 inches thick. It is 90 percent phyllite and shale fragments coated with yellowish brown loam. Hard phyllite and shale are at a depth of 38 inches.

Typically, the surface layer of the Hartleton soil is yellowish brown channery loam about 7 inches thick. The subsoil is yellowish brown and brownish yellow channery and very channery loam about 25 inches thick. The substratum is about 12 inches thick. It is brownish yellow extremely channery loam. Hard phyllite and shale are at a depth of 44 inches.

Included with these soils in mapping are small areas, generally less than 3 acres in size, of well drained Tusquee soils. The Tusquee soils are along small streams and in valleys. Also included are small areas of soils that have an extremely stony surface layer, areas that have outcrops of rock, and small areas that do not have stones on the surface. The included soils and outcrops make up about 10 percent of mapped areas.

Permeability is moderately rapid or rapid in the Cataska soil and moderate or moderately rapid in the Hartleton soil. The available water capacity is low for the Cataska soil and moderate for the Hartleton soil. Surface runoff is rapid. The hazard of erosion is severe. The natural fertility and organic matter content are low. The subsoil has low shrink-swell potential. The root zone extends to a depth of less than 20 inches in the Cataska soil and to more than 30 inches in the Hartleton soil. The surface layer and subsoil are commonly very strongly acid or strongly acid, unless limed.

Most areas of this complex are in woodland.

This complex is not suited to hay and cultivated crops. Large stones on the surface make use of modern tillage equipment impractical. The soils are droughty during the growing season. The hazard of erosion is a major management concern.

This complex is poorly suited to pasture crops. Maintaining a mixture of grasses and legumes and overgrazing are major pasture management concerns. Proper stocking rates to maintain desirable grasses and legumes, addition of lime and fertilizer according to soil

tests, and controlled grazing are useful in pasture management.

Potential productivity for trees is low for the Cataska soil and moderately high for the Hartleton soil. The soils are managed mostly for pine. The survival of seeds and seedlings is severely affected by droughtiness during the growing season. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits the safe operation of heavy equipment.

Depth to bedrock and slope are the main limitations for nonfarm uses of this complex.

This complex is in capability subclass VIIc.

**11E—Cataska-Hartleton very stony loams, 25 to 60 percent slopes.** This complex consists of steep to very steep, excessively drained and well drained, moderately deep and deep soils on side slopes. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Slopes are smooth and about 500 to 1,000 feet long. Areas of this complex are along the mountain ranges and are long and winding. They range from 20 to about 100 acres.

This complex is about 60 percent Cataska soils and 30 percent Hartleton soils. Other soils make up the rest. The areas of individual soils are so small or so intermingled that to separate them in mapping was not practical.

Typically, the surface layer of the Cataska soil is very dark grayish brown and brown channery loam about 5 inches thick. The subsoil is yellowish brown, friable very channery silt loam about 15 inches thick. The substratum is about 18 inches thick. It is 90 percent phyllite and shale fragments coated with yellowish brown silt loam. Hard phyllite and shale are at a depth of 38 inches.

Typically, the surface layer of the Hartleton soil is yellowish brown channery loam about 7 inches thick. The subsoil is yellowish brown and brownish yellow channery and very channery loam about 25 inches thick. The substratum is about 12 inches thick. It is brownish yellow extremely channery loam. Hard phyllite and shale are at a depth of 44 inches.

Included with these soils in mapping are small areas, generally less than 3 acres in size, of well drained Tusquee soils. The Tusquee soils are along small streams and in valleys. Also included are small areas of soils that have an extremely stony surface layer, areas that have outcrops of rock, and small areas that do not have stones on the surface. The included soils and outcrops make up about 10 percent of mapped areas.

Permeability is moderately rapid or rapid in the Cataska soil and moderate or moderately rapid in the Hartleton soil. The available water capacity is very low for the Cataska soil and moderate for the Hartleton soil. Surface runoff is very rapid. The hazard of erosion is very severe. The natural fertility and organic matter content are low. The subsoil has low shrink-swell potential. The root zone extends to a depth of less than

20 inches in the Cataska soil and to more than 30 inches in the Hartleton soil. The surface layer and subsoil are commonly very strongly acid or strongly acid, unless limed.

Most areas of this complex are in woodland.

This complex is not suited to hay and cultivated crops. Large stones and steep slopes make the use of modern tillage equipment impractical. The soils are droughty during the growing season. The hazard of erosion is a major management concern.

This complex is poorly suited to pasture crops. Maintaining a mixture of grasses and legumes and overgrazing are major pasture management concerns. Proper stocking rates to maintain desirable grasses and legumes, addition of lime and fertilizer according to soil tests, and controlled grazing are useful in pasture management.

Potential productivity for trees on this complex is low for the Cataska soil and moderately high for the Hartleton soil. The soils are managed mostly for pine. The survival of seeds and seedlings is severely affected by droughtiness during the growing season. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits the safe operation of heavy equipment.

Depth to bedrock and slope are the main limitations for nonfarm uses of this complex.

This complex is in capability subclass VIIc.

**12C—Catoctin silt loam, 7 to 15 percent slopes.** This soil is moderately deep, strongly sloping, and well drained. It is on side slopes and narrow convex ridgetops. Areas are irregularly elongated and range from 5 to about 20 acres.

Typically, the surface layer is dark brown and dark yellowish brown silt loam about 5 inches thick. The subsoil is about 13 inches thick. It is strong brown very channery silt loam containing pockets of reddish brown silty clay loam. The substratum below a depth of 18 inches is yellowish brown extremely channery silty loam. Hard greenstone bedrock is at a depth of 28 inches.

Included with this soil in mapping are small areas of well drained Myersville, Rabun, and Starr soils. The Myersville and Rabun soils are throughout the mapped area. The Starr soils are on foot slopes and along small drainageways. Also included are small areas that have outcrops of rock and areas that have slopes of less than 7 percent. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability is moderately rapid, and available water capacity is very low. Surface runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The subsoil has low shrink-swell potential. The root zone is 20 to 30 inches thick. The organic matter content is low to moderate, and the natural fertility is medium. This soil

commonly is strongly acid to slightly acid, unless limed. Depth to bedrock is 20 to 40 inches.

Most areas of this soil are in woodland. A few areas are in pasture.

This soil is moderately well suited to cultivated crops. Crop response to lime and fertilizer is limited by the very low available water capacity. Conservation tillage, using cover crops and grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and control erosion. They also improve tilth, infiltration, and fertility and increase the available water capacity.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface layer, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is moderate for oaks and pines. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, mowing, and girdling. Slope and erosion are the major hazards or limitations to the growing and harvesting of trees.

This soil is limited for most nonfarm uses. Slope, depth to bedrock, and seepage are limitations for sanitary facilities. Slope and depth to bedrock are limitations for most building sites. Because of slope and droughtiness this soil is poorly suited to lawns, landscaping, and golf fairways. Depth to bedrock limits its use as a source of roadfill. This soil is limited for most recreational development. Slope limits its use for playgrounds. This soil is good for use as openland wildlife habitat and fair for use as woodland wildlife habitat.

This soil is in capability subclass IIIe.

**12D—Catoctin silt loam, 15 to 25 percent slopes.**

This soil is moderately deep, moderately steep, and well drained. It is on side slopes. Areas are irregularly elongated and range from 5 to about 50 acres.

Typically, the surface layer is dark brown and dark yellowish brown silt loam about 5 inches thick. The subsoil is about 13 inches thick. It is strong brown very channery silt loam containing pockets of reddish brown silty clay loam. The substratum below a depth of 18 inches is yellowish brown extremely channery silt loam. Hard greenstone bedrock is at a depth of 28 inches.

Included with this soil in mapping are small areas of well drained Myersville, Rabun, and Starr soils. The Myersville and Rabun soils are throughout the mapped area. The Starr soils are on foot slopes and along small drainageways. The included soils make up about 20 percent of mapped areas.

Permeability is moderately rapid, and available water capacity is very low. Surface runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The subsoil has low shrink-swell potential. The root zone is 20 to 30 inches thick. The organic matter content is low to moderate, and natural fertility is medium. This soil is commonly strongly acid to slightly acid. Depth to bedrock is 20 to 40 inches.

Most areas of this soil are in woodland. A few areas are in pasture.

This soil is poorly suited to cultivated crops. Crop response to lime and fertilizer is limited by the very low available water capacity. Conservation tillage, using cover crops, grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and control erosion. They also improve tilth, infiltration, and fertility and increase the available water capacity.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface layer, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is moderate for oaks and pines. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, mowing, and girdling. Slope and erosion are the major hazards or limitations to the growing and harvesting of trees.

This soil is limited for most nonfarm uses. Slope, depth to bedrock, and seepage are limitations for sanitary facilities. Slope and depth to bedrock are limitations for most building sites. Because of the moderately steep slopes this soil is poorly suited to lawns, landscaping, and golf fairways. Slope, excess fines, and depth to bedrock limit its use as a source of roadfill. This soil is limited for most recreational development. Slope limits its use for playgrounds. This soil is good for use as openland wildlife habitat and fair for use as woodland wildlife habitat.

This soil is in capability subclass IVe.

**12E—Catoctin silt loam, 25 to 45 percent slopes.**

This soil is moderately deep, steep, and well drained. It is on side slopes. Areas are irregularly elongated and range from 5 to 50 acres or more.

Typically, the surface layer is dark brown and dark yellowish brown silt loam about 5 inches thick. The subsoil is about 13 inches thick. It is strong brown very channery silt loam containing pockets of reddish brown silty clay loam. The substratum below a depth of 18

inches is yellowish brown extremely channery silt loam. Hard greenstone bedrock is at a depth of 28 inches.

Included with this soil in mapping are small areas of well drained Myersville, Rabun, and Starr soils. The Myersville and Rabun soils are throughout the mapped areas. The Starr soils are on foot slopes and along small drainageways. Also included are small areas that have outcrops of rock and areas that have slopes of less than 25 percent. The included soils and outcrops make up about 25 percent of mapped areas.

Permeability is moderately rapid, and available water capacity is low. Surface runoff is very rapid. The hazard of erosion is very severe. The subsoil has low shrink-swell potential. The root zone is 20 to 30 inches thick. The organic matter content is low to moderate, and the natural fertility is medium. This soil commonly is strongly acid to slightly acid. Depth to bedrock is 20 to 40 inches.

Most areas of this soil are in woodland. A few areas are in pasture.

This soil is not suited to cultivated crops. The use of modern tillage equipment is impractical because of the steep slope.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface layer, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is moderate for oaks and pines. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, mowing, and girdling. Slope and erosion are the major hazards or limitations to the growing and harvesting of trees.

This soil is very limited for most nonfarm uses. Slope, depth to bedrock, and seepage are limitations for sanitary facilities. Slope and depth to bedrock are limitations for most building sites. Because of the steep slope this soil is severely limited for lawns, landscaping, and golf fairways. Slope and bedrock limit its use as a source of roadfill. This soil is limited for most recreational development. Slope limits its use for playgrounds. This soil is fair for use as openland wildlife habitat and fair for use as woodland wildlife habitat.

This soil is in capability subclass VIe.

**13C—Catoctin very stony silt loam, 7 to 15 percent slopes.** This soil is moderately deep, strongly sloping, and well drained. It is on side slopes and narrow convex ridgetops. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Areas are irregularly elongated and range from 5 to about 20 acres.

Typically, the surface layer is dark brown and dark yellowish brown silt loam about 5 inches thick. The subsoil is about 13 inches thick. It is strong brown very channery silt loam containing pockets of reddish brown silty clay loam. The substratum below a depth of 18 inches is yellowish brown extremely channery silt loam. Hard greenstone bedrock is at a depth of 28 inches.

Included with this soil in mapping are small areas of well drained Myersville, Rabun, and Starr soils. The Myersville and Rabun soils are throughout the mapped area. The Starr soils are on foot slopes and along small drainageways. Also included are small areas that have outcrops of rock and areas that have slopes of less than 7 percent. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability is moderately rapid, and available water capacity is very low. Surface runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The subsoil has low shrink-swell potential. The root zone is 20 to 30 inches thick. The organic matter content is low to moderate, and the natural fertility is medium. This soil commonly is strongly acid to slightly acid, unless limed. Depth to bedrock is 20 to 40 inches.

Most areas of this soil are in woodland. A few areas are in pasture.

This soil is not suited to hay and cultivated crops. The stones on the surface make use of modern equipment impractical.

This soil is moderately well suited to pasture crops. Establishing and maintaining a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface layer, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is moderate for oaks and pines. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, mowing, and girdling. Slope and erosion are the major hazards or limitations to the growing and harvesting of trees.

This soil is limited for most nonfarm uses. Slope, depth to bedrock, and seepage are limitations for sanitary facilities. Slope and depth to bedrock are limitations for most building sites. Because of slope, large stones, and droughtiness this soil is poorly suited to lawns, landscaping, and golf fairways. Excess fines and depth to bedrock limit its use as a source of roadfill. This soil is limited for most recreational development. Slope and large stones limit its use as playgrounds. This soil is poor for use as openland wildlife habitat and fair for use as woodland wildlife habitat.

This soil is in capability subclass VIi.

**13D—Catoctin very stony silt loam, 15 to 25 percent slopes.** This soil is moderately deep, moderately steep, and well drained. It is on side slopes. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Areas are irregularly elongated and range from 5 to about 50 acres.

Typically, the surface layer is dark brown and dark yellowish brown silt loam about 5 inches thick. The subsoil is about 13 inches thick. It is strong brown very channery silt loam containing pockets of reddish brown silty clay loam. The substratum below a depth of 18 inches is yellowish brown extremely channery silt loam. Hard greenstone bedrock is at a depth of 28 inches.

Included with this soil in mapping are small areas of well drained Myersville, Rabun, and Starr soils. The Myersville and Rabun soils are throughout the mapped area. The Starr soils are on foot slopes and along small drainageways. Also included are small areas that have outcrops of rock, areas that have slopes of more than 25 percent, and areas that do not have stones on the surface. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability is moderately rapid, and available water capacity is very low. Surface runoff is rapid. The hazard of erosion is severe. The subsoil has low shrink-swell potential. The root zone is 20 to 30 inches thick. The organic matter content is low to moderate, and the natural fertility is medium. This soil is commonly strongly acid to slightly acid. Depth to bedrock is 20 to 40 inches.

Most areas of this soil are in woodland. A few areas are in pasture.

This soil is not suited to hay and cultivated crops. The stones on the surface make use of modern equipment impractical.

This soil is moderately well suited to pasture crops. Establishing and maintaining a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface layer, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is moderate for oaks and pines. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, mowing, and girdling. Slope and erosion are the major hazards or limitations to the growing and harvesting of trees.

This soil is limited for most nonfarm uses. Slope, depth to bedrock, and seepage are limitations for sanitary facilities. The slope is a limitation for most building sites. Because of the slope this soil is severely limited for lawns, landscaping, and golf fairways. Excess fines and depth to bedrock limit its use as a source of roadfill. This soil is limited for most recreational development. Slope

and large stones limit its use as playgrounds. This soil is poor for use as openland wildlife habitat and fair for use as woodland wildlife habitat.

This soil is in capability subclass IVs.

**13E—Catoctin very stony silt loam, 25 to 45 percent slopes.** This soil is moderately deep, steep, and well drained. It is on side slopes of the Blue Ridge and Southwest Mountain. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Areas are irregularly elongated and range from 5 to about 50 acres.

Typically, the surface layer is dark brown and dark yellowish brown silt loam about 5 inches thick. The subsoil is about 13 inches thick. It is strong brown very channery silt loam containing pockets of reddish brown silty clay loam. The substratum below a depth of 18 inches is yellowish brown extremely channery silt loam. Hard greenstone bedrock is at a depth of 28 inches.

Included with this soil in mapping are small areas of well drained Myersville, Rabun, and Starr soils. The Myersville and Rabun soils are throughout the mapped area. The Starr soils are on foot slopes and along small drainageways. Also included are small areas that have outcrops of rock, areas that have slopes of less than 25 percent, and areas that do not have stones on the surface. The included soils and outcrops make up about 25 percent of mapped areas.

Permeability is moderately rapid, and available water capacity is low. Surface runoff is very rapid. The hazard of erosion is very severe. The subsoil has low shrink-swell potential. The root zone is 20 to 30 inches thick. The organic matter content is low to moderate, and natural fertility is medium. This soil commonly is strongly acid to slightly acid. Depth to bedrock is 20 to 40 inches.

Most areas of this soil are in woodland. A few areas are in pasture.

This soil is not suited to hay and cultivated crops. The stones on the surface and steep slopes make use of tillage equipment impractical.

This soil is poorly suited to pasture crops. Establishing and maintaining a mixture of adapted grasses and legumes and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface layer, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is moderate for oaks and pines. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, mowing, and girdling. Slope and erosion are the major hazards or limitations to the growing and harvesting of trees.

This soil is severely limited for most nonfarm uses. Slope, depth to bedrock, and seepage are limitations for sanitary facilities. Slope and depth to bedrock are limitations for most building sites. Because of the steep

slope this soil is severely limited for lawns, landscaping, and golf fairways. Slope, excess fines, and depth to bedrock limit its use as a source of roadfill. This soil is severely limited for most recreational development. Slope and large stones limit its use as playgrounds. This soil is poor for use as openland wildlife habitat and fair for use as woodland wildlife habitat.

This soil is in capability subclass VII.

**14B—Chester loam, 2 to 7 percent slopes.** This deep, gently sloping, well drained soil is on narrow to broad, convex ridgetops in the Piedmont. Slopes are smooth and about 100 to 300 feet long. Areas of this soil commonly are irregularly rounded or long and winding. They range from 3 to about 20 acres.

Typically, the surface layer of this soil is dark brown loam about 7 inches thick. The subsoil is mostly strong brown loam and yellowish red clay loam about 34 inches thick. The substratum is multicolored yellowish red, strong brown, white, and yellowish brown loam and sandy loam to a depth of 60 inches.

Included with this soil in mapping are small areas of somewhat excessively drained Ashe soils and well drained Hayesville and Thurmont soils. The Ashe soils are near breaks to steeper slopes and around outcrops of rock. The Hayesville and Thurmont soils are throughout the mapped area. Also included are small areas of soils that have a gravelly or very stony surface layer and severely eroded soils that have a surface layer of yellowish red clay loam. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is medium. The hazard of erosion is moderate. This soil has good tilth. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content and the natural fertility are low. This soil commonly is strongly acid to very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 60 inches.

Most areas of this soil are farmed. Some areas are in pasture, and a few areas are in woodland.

This soil is well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Hardwoods do well on this soil.

The potential frost action and the moderately permeable subsoil are the main limitations for nonfarm uses. The moderately permeable subsoil limits use of the soil for septic tank absorption fields and for sewage lagoons. The potential frost action is a limitation for local roads and streets. Slope is a limitation for playgrounds. This soil is a good source of roadfill.

This soil is in capability subclass IIe.

**14C—Chester loam, 7 to 15 percent slopes.** This deep, strongly sloping, well drained soil is on narrow, convex ridgetops, the points of ridges, and narrow, convex side slopes. Slopes are smooth and about 200 to 500 feet long. Areas of this soil commonly are long and winding. They range from 5 to about 40 acres.

Typically, the surface layer of the Chester soil is dark brown loam about 7 inches thick. The subsoil is about 34 inches thick. It is mostly strong brown loam and yellowish red clay loam. The substratum to a depth of 60 inches is multicolored yellowish red, strong brown, white, and yellowish brown loam and sandy loam.

Included with this soil in mapping are small areas of somewhat excessively drained Ashe soils, well drained Hayesville and Thurmont soils, and well drained to moderately well drained Meadowville soils. The Ashe soils are near breaks to steeper slopes and around outcrops of rock. The Hayesville and Thurmont soils are throughout the mapped area. The Meadowville soils are along small drainageways and in depressions. Also included are small areas of soils that have a gravelly or very stony surface layer and small areas of severely eroded soils that have a yellowish red clay loam surface layer. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content and the natural fertility are low. This soil commonly is strongly acid or very strongly acid, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 60 inches.

Most areas of this soil are farmed. Some areas are in pasture, and some areas are in woodland.

This soil is moderately well suited to cultivated crops. The severe hazard of erosion is a major management concern. When lime and fertilizer are applied according to soil tests, crops respond well. Minimum tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain tilth and the content of organic matter and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. Hardwoods do well. Seeds and seedlings survive and grow well if competing vegetation is controlled.

Slope, a moderately permeable subsoil, and potential frost action are the main limitations for nonfarm uses. Slope limits use of the soil as a building site and for recreational development. Slope and the moderately permeable subsoil limit most sanitary facilities. The potential frost action and slope limit use of the soil for local roads and streets. This soil is a good source of roadfill.

This soil is in capability subclass IIIe.

**14D—Chester loam, 15 to 25 percent slopes.** This deep, moderately steep, well drained soil is on narrow, convex side slopes. Slopes are smooth and about 200 to 500 feet long. Areas of this soil commonly are long and winding. They range from 15 to about 40 acres.

Typically, the surface layer of the Chester soil is dark brown loam about 7 inches thick. The subsoil is about 34 inches thick. It is mostly strong brown loam and yellowish red loam and clay loam. The substratum to a depth of 60 inches is multicolored yellowish red, strong brown, white, and yellowish brown loam and sandy loam.

Included with this soil in mapping are small areas of somewhat excessively drained Ashe soils, well drained Hayesville and Thurmont soils, and well drained to moderately well drained Meadowville soils. The Ashe soils are near breaks to steeper slopes and around the outcrops of rock. The Hayesville and Thurmont soils are throughout the mapped area. The Meadowville soils are along small drainageways and in depressions. Also included are small areas of soils that have a gravelly or very stony surface layer and small areas of severely eroded soils that have a yellowish red clay loam surface layer. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content and natural fertility are low. This soil commonly is strongly acid or very strongly acid, but reaction in the surface layer is variable because of local liming. Bedrock generally is at a depth of more than 60 inches.

Most areas of this soil are in pasture, and some areas are in woodland.

This soil is poorly suited to cultivated crops. The severe erosion hazard is a major management concern.

When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. Hardwoods do well. Seeds and seedlings survive and grow well if competing vegetation is controlled. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff to help control erosion. The slope limits safe operation of heavy equipment.

Slope is the main limitation for nonfarm uses. Slope limits use of the soil as a building site, for recreational development, and for most sanitary facilities. The soil is a fair source of roadfill.

This soil is in capability subclass IVe.

**14E—Chester loam, 25 to 45 percent slopes.** This deep, steep, well drained soil is on convex side slopes in the Piedmont and Blue Ridge. Slopes are smooth and about 200 to 800 feet long. Areas of this soil commonly are long and winding. They range from 15 to about 75 acres.

Typically, the surface layer of the Chester soil is dark brown loam about 7 inches thick. The subsoil is about 34 inches thick. It is mostly strong brown loam and yellowish red loam and clay loam. The substratum to a depth of 60 inches is multicolored yellowish red, strong brown, white, and yellowish brown loam and sandy loam.

Included with this soil in mapping are small areas of somewhat excessively drained Ashe soils, well drained Hayesville soils, excessively drained Parker soils, and well drained to moderately well drained Meadowville soils. The Ashe, Hayesville, and Parker soils are throughout the mapped area. The Meadowville soils are along small drainageways and on foot slopes. Also included are small areas of soils that have a gravelly or very stony surface layer and small areas of severely eroded soils that have a yellowish red clay loam surface layer. Included soils make up about 25 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is very rapid. The hazard of erosion is very severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content and the natural fertility are low. This soil commonly is strongly acid or

very strongly acid, but reaction in the surface layer is variable because of local liming. Bedrock generally is at a depth of more than 60 inches.

Some areas of this soil are in pasture, and some areas are in woodland.

This soil is not suited to hay and cultivated crops. The use of modern equipment is impractical because of the steep slopes. The severe hazard of erosion is a major management concern.

This soil is moderately well suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. Hardwoods do well. Seeds and seedlings survive and grow well if competing vegetation is controlled. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits safe operation of heavy equipment.

The slope is the main limitation for nonfarm uses. Slope limits use of the soil as a building site and for recreational development, most sanitary facilities, and local roads and streets. This soil is a poor source of roadfill because of steep slopes.

This soil is in capability subclass VIe.

**15C—Chester very stony loam, 7 to 15 percent slopes.** This soil is deep, strongly sloping, and well drained. It is on narrow, convex ridgetops, the points of ridges, and narrow, convex side slopes. Stones, about 3 to 10 feet apart, cover 3 to 15 percent of the surface. Slopes are smooth and about 200 to 600 feet long. Areas of this soil commonly are long and winding. They range from 5 to about 50 acres.

Typically, the surface layer of this soil is dark brown loam about 7 inches thick. The subsoil is about 34 inches thick. It is mostly strong brown loam and yellowish red loam and clay loam. The substratum to a depth of 60 inches is mostly yellowish red, strong brown, white, and yellowish brown loam and sandy loam.

Included with this soil in mapping are small areas of somewhat excessively drained Ashe soils, excessively drained Parker soils, and well drained Hayesville and Porters soils. The Ashe and Parker soils are near breaks to steeper slopes and around outcrops of rock. The Hayesville soils are throughout the mapped area. The Porters soils are mainly on north-facing slopes. Also included are small areas of soils that do not have stones on the surface. The included soils and outcrops make up about 25 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. The subsoil has low shrink-swell potential. The

root zone extends to a depth of 40 inches or more. The organic matter content and natural fertility are low. This soil commonly is strongly acid or very strongly acid.

Bedrock is generally at a depth of more than 60 inches.

Most areas of this soil are in woodland. A few areas are in permanent pasture.

This soil is not suited to hay and cultivated crops. Stones on the surface make use of modern equipment impractical.

This soil is moderately well suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. Hardwoods do well. Seeds and seedlings survive and grow well if competing vegetation is controlled.

The slope, the moderately permeable subsoil, low strength, and stones are the main limitations for nonfarm uses. Slope and large stones limit use of the soil as a building site and for recreational development. Slope, large stones, and the moderately permeable subsoil limit its use for most sanitary facilities. The low strength and slope limit its use for local roads and streets. This soil is a fair source of roadfill.

This soil is in capability subclass VIe.

**15D—Chester very stony loam, 15 to 25 percent slopes.** This deep, moderately steep and sloping, well drained soil is on narrow convex ridgetops and side slopes. Stones, about 3 to 10 feet apart, cover 3 to 15 percent of the surface. Slopes are smooth and about 300 to 1,200 feet long. Areas of this soil commonly are long and winding.

Typically, the surface layer of this soil is dark brown loam about 7 inches thick. The subsoil is about 34 inches thick. It is mostly strong brown and yellowish red loam and clay loam. The substratum to a depth of 60 inches is mostly yellowish red, strong brown, white, and yellowish brown loam and sandy loam.

Included with this soil in mapping are small areas of somewhat excessively drained Ashe soils, excessively drained Parker soils, and well drained Hayesville and Porters soils. The Ashe and Parker soils are near breaks to steeper slopes and around outcrops of rock. The Hayesville soils are throughout the mapped area. The Porters soils are mainly on north-facing slopes. Also included are small areas of soils that do not have stones on the surface. The included soils and outcrops make up about 25 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content and the natural fertility are low.

This soil commonly is strongly acid or very strongly acid. Bedrock is generally at a depth of more than 60 inches.

Most areas of this soil are in woodland. A few areas are in permanent pasture.

This soil is not suited to hay and cultivated crops. Stones on the surface make use of modern equipment impractical.

This soil is moderately well suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. Hardwoods do well. Seeds and seedlings survive and grow well if competing vegetation is controlled.

The slope and the large stones are the main limitations for nonfarm uses. Slope limits use of the soil as a building site and for recreational development. Slope and large stones limit its use for most sanitary facilities. The slope limits its use for local roads and streets. This soil is a fair source of roadfill.

This soil is in capability subclass VIs.

**15E—Chester very stony loam, 25 to 45 percent slopes.** This deep, steep, well drained soil is on mountain side slopes. Stones, about 3 to 10 feet apart, cover 3 to 15 percent of the surface. Slopes are smooth and about 400 to 1,500 feet long. Areas of this soil commonly are long and winding. They range from 15 to about 100 acres.

Typically, the surface layer of this soil is dark brown loam about 7 inches thick. The subsoil is about 34 inches thick. It is mostly strong brown and yellowish red loam and clay loam. The substratum to a depth of 60 inches is mostly yellowish red, strong brown, white, and yellowish brown loam and sandy loam.

Included with this soil in mapping are small areas of somewhat excessively drained Ashe soils, excessively drained Parker soils, and well drained Hayesville and Porters soils. The Ashe and Parker soils are throughout the mapped area, generally around outcrops of rock. The Hayesville soils are throughout the area. The Porters soils are mainly on north-facing slopes. Also included are small areas of soils that do not have stones on the surface. Included soils and outcrops make up about 25 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is very rapid. The hazard of erosion is very severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content and the natural fertility are low. This soil commonly is strongly acid or very strongly acid. Bedrock is generally at a depth of more than 60 inches.

Most areas of this soil are in woodland. A few areas are in permanent pasture.

This soil is not suited to hay and cultivated crops. Large stones and steep slopes make use of modern equipment impractical.

This soil is poorly suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. Hardwoods do well. Seeds and seedlings survive and grow well if competing vegetation is controlled.

The slope limits use of this soil for most nonfarm uses. Slope and large stones limit use of the soil for topsoil. The soil is a poor source of roadfill because of the steep slopes.

This soil is in capability subclass VIIIs.

**16—Chewacla silt loam.** This deep, nearly level, somewhat poorly drained soil is on flood plains along streams and large drainageways in the Piedmont. Areas of this low-lying soil commonly are long and narrow. They range from 5 to about 50 acres. Slopes are 0 to 2 percent.

Typically, the surface layer of this soil is dark brown silt loam about 8 inches thick. The subsoil is 52 inches thick. The upper part of the subsoil to a depth of 26 inches is mostly pale brown and light yellowish brown silt loam and silty clay loam and has light gray mottles. The lower part of the subsoil to a depth of 60 inches or more is light brownish gray and yellowish brown silty clay loam and silt loam.

Included with this soil in mapping are small areas of well drained Riverview soils and poorly drained Wehadkee soils. The Riverview soils are on the slightly higher positions, mainly close to the stream. The Wehadkee soils are in depressions, mainly away from the stream. Also included are small areas of sandy soils and gravelly soils. Included soils make up about 15 percent of mapped areas.

Permeability is moderate, and available water capacity is high. Surface runoff is slow. The hazard of erosion is slight. This soil has good tilth. The substratum has low shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content is low to moderate, and the natural fertility is medium. This soil commonly is slightly acid to strongly acid throughout, but reaction in the surface layer is variable because of local liming. Flooding occurs on occasion for brief periods from late in fall to spring. A seasonal high water table is at depth of 1/2 foot to 1 1/2 feet during winter and spring.

Most areas of this soil are farmed. Some areas are in pasture.

This soil is well suited to cultivated crops where drained and protected from flooding. When lime and fertilizer are applied according to soil tests, crops respond well. The soil is wet and cold in spring, and wetness commonly interferes with tillage. If the soil is not protected from flooding, crops are damaged by brief flooding on an average of once or less every 2 years. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth, reduce crusting, and increase water infiltration.

This soil is well suited to most pasture and hay crops. Alfalfa is short lived because of the seasonal wetness. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, drainage, control of flooding, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is wet causes compaction of the surface soil and damages stands of grasses and legumes.

Potential productivity for trees on this soil is very high, especially for loblolly pine, American sycamore, yellow-poplar, and sweetgum. Seeds and seedlings are limited by the seasonal wetness. The soil is soft when wet, and the use of heavy equipment is limited during wet periods.

The shallow depth to the seasonal high water table and flooding are the main limitations for nonfarm uses. The seasonal high water table and flooding prevent use of the soil as a building site, for most sanitary facilities, and for recreational areas. Many areas dry out slowly in spring and after heavy rains. Low strength and excess fines limit use of this soil as a source of roadfill.

This soil is in capability subclass IIIw.

**17—Craigs ville loam.** This deep, nearly level, well drained soil is on flood plains and first bottoms. Areas of this soil commonly are elongated. They are along the course of the adjacent stream. They range from 5 to about 100 acres. Slopes commonly are 0 to 2 percent (fig. 4).

Typically, the surface layer of this soil is brown loam about 8 inches thick. The subsoil is about 15 inches thick. It is mostly brown gravelly or very cobbly sandy loam. The substratum to a depth of 60 inches or more is strong brown extremely cobbly sandy loam and extremely gravelly loamy sand.

Included with this soil in mapping are small spots and strips that are somewhat poorly drained and poorly drained. These spots and strips are in depressions and areas away from the streams and where springs enter the flood plain. They are indicated on the soil maps by wet spot symbols. Also included are small areas of soils that have a cobbly surface layer. The somewhat poorly drained and poorly drained soils make up about 15 percent of mapped areas, and the other included soils make up about 35 percent.

Permeability is moderately rapid or rapid, and available water capacity is very low or low. This soil has good tilth. The surface layer is friable and easily tilled, but cobbly spots may interfere with tillage. Surface runoff is slow. The hazard of erosion is slight. The subsoil has low shrink-swell potential. The root zone extends to a depth of 60 inches or more. The organic matter content is low to high, and the natural fertility is medium. This soil commonly is very strongly acid or strongly acid throughout, but reaction in the surface layer is variable as a result of local liming. Flooding occurs on occasion for very brief periods during winter and spring.

Most areas of this soil are in pasture. A few areas are farmed, and a few areas are in woodland.

This soil is moderately well suited to cultivated crops. It is droughty during the growing season. Crops are damaged by very brief flooding on an average of once in 2 to 5 years. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to reduce crusting and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is wet causes compaction of the surface soil and damages the stand of grasses and legumes.

Potential productivity for trees on this soil is high, especially for loblolly pine, eastern white pine, and yellow-poplar. The soil is managed mostly for hardwoods. Seeds and seedlings survive and grow well if competing vegetation is controlled.

Flooding is the main limitation for nonfarm uses (fig. 5). It limits the use of the soil for building sites, for sanitary landfills, for septic tank absorption fields, and for most recreational uses. This soil is a fair source of roadfill, but the large stones limit this use.

This soil is in capability subclass IIIw.

**18B—Creedmoor loam, 2 to 7 percent slopes.** This deep, gently sloping, moderately well drained to somewhat poorly drained soil is on toe slopes, in upland depressions, at the heads of drainageways, and along intermittent drainageways. Slopes are smooth and about 100 to 300 feet long. Most areas of this soil are irregularly long and winding. They range from 3 to about 15 acres.

Typically, the surface layer of this soil is brown loam about 8 inches thick. The subsoil is about 52 inches thick. The upper 35 inches of the subsoil is mostly yellowish brown silty clay loam and clay and has gray mottles below a depth of about 22 inches. The lower 17 inches of the subsoil is light gray clay and has reddish yellow and brownish yellow mottles. The substratum to a



Figure 4.—Streambank in Craigsville loam on flood plain. McQueen loam, 2 to 7 percent slopes, on terrace behind the fence. Chester loam, 25 to 45 percent slopes, on forested side slopes in background.

depth of 70 inches is multicolored red and reddish yellow clay loam and has pockets of light gray silty clay.

Included with this soil in mapping are small areas of well drained to moderately well drained Manassas soils and poorly drained Worsham soils. The Manassas soils are on the higher positions throughout the mapped area, and the Worsham soils are on the slightly lower positions. Also included are small areas that have slopes of less than 2 percent. Included soils make up about 20 percent of mapped areas.

Permeability is very slow, and available water capacity is moderate. Surface runoff is medium. The hazard of erosion is moderate. This soil has good tilth. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 30 inches. Depth to bedrock is generally more than 5 feet. The organic matter content is low, and the natural fertility is medium. This soil

commonly is very strongly acid throughout, but reaction in the surface layer is variable because of local liming. A seasonal high water table is at a depth of 1 1/2 to 2 feet during winter and early in spring.

Most areas of this soil are in pasture or woodland.

This soil is moderately well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. The soil is wet and cold early in spring, and wetness commonly interferes with early tillage. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled

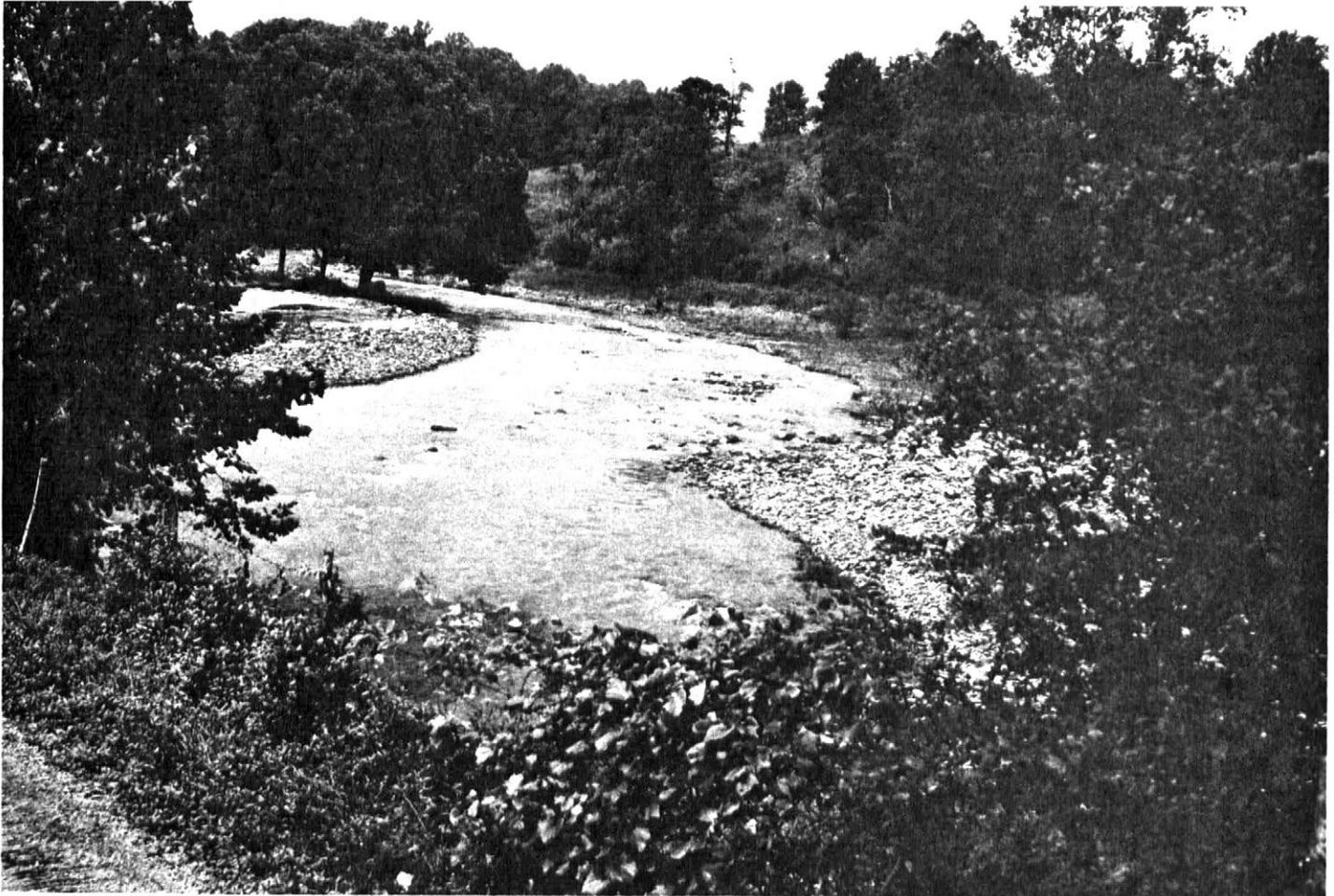


Figure 5.—An active stream flowing through an area of Craigsville loam.

grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is wet causes compaction of the surface soil and damages stands of grasses and legumes.

Potential productivity for trees on this soil is moderately high, especially for loblolly pine, yellow-poplar, sweetgum, and oaks. Seeds and seedlings survive and grow well. The soil is soft when wet, and the use of heavy equipment is limited during wet periods.

The shallow depth to the seasonal high water table, the moderate shrink-swell potential, and the clayey, slowly permeable subsoil are the main limitations for nonfarm uses. The seasonal high water table and moderate shrink-swell potential limit use of this soil as a building site. The slowly permeable clayey subsoil and the seasonal wetness limit most sanitary facilities. The seasonal wetness and slow permeability are limitations

for recreational development. The low strength and excess fines limit use of this soil as a source of roadfill.

This soil is in capability subclass IIIw.

**19B—Cullen loam, 2 to 7 percent slopes.** This deep, gently sloping, well drained soil is on narrow to broad convex ridgetops. Areas of this soil commonly are irregularly rounded or oblong. They range from 3 to 15 or more acres.

Typically, the surface layer of this soil is reddish brown loam about 8 inches thick. The subsoil is mostly red or dark red clay and clay loam about 52 inches thick. The substratum is mostly red, yellowish red, and yellowish brown loam.

Included with this soil in mapping are small areas of well drained Ashe and Hayesville soils. The Hayesville soils are on landscape positions similar to this Cullen soil. The Ashe soils are on the more sloping positions.

Also included are small areas of soils that have bedrock at a depth of about 24 inches and severely eroded areas that have a surface layer of red clay loam and clay. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is medium. The hazard of erosion is moderate. This soil has good tilth. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 60 inches or more. The organic matter content is low to moderate, and the natural fertility is medium. This soil commonly is medium acid to strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are farmed. Some areas are in woodland.

This soil is well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil.

The low strength, the moderate shrink-swell potential, and the moderately permeable clayey subsoil are the main limitations for nonfarm uses. The low strength and the shrink-swell potential limit use of this soil as a building site, and the clayey subsoil limits excavations. When wet, the clayey subsoil limits vehicular traffic. The moderately permeable subsoil limits use of the soil for septic tank absorption fields. The low strength and excess fines limit its use as a source of roadfill.

This soil is in capability subclass IIe.

**19C—Cullen loam, 7 to 15 percent slopes.** This deep, strongly sloping, well drained soil is on narrow convex ridgetops and on convex side slopes. Areas of this soil are commonly long and winding. They range from 3 to about 20 acres.

Typically, the surface layer of this soil is reddish brown loam about 8 inches thick. The subsoil is mostly red or dark red clay and clay loam about 52 inches thick. The substratum to a depth of 67 inches is mostly red, yellowish red, and yellowish brown loam.

Included with this soil in mapping are small areas of well drained Ashe and Hayesville soils. The Hayesville soils are on landscape positions similar to those of this Cullen soil. The Ashe soils are on the more sloping positions. Also included are small areas of soils that have bedrock at a depth of about 24 inches and of severely eroded soils that have a red clay loam or clay surface layer. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The subsoil has moderate shrink-swell potential. The organic matter content is low to moderate, and the natural fertility is medium. This soil is commonly medium acid to strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are farmed. A few areas are in woodland.

This soil is moderately well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high, especially for loblolly pine, Virginia pine, yellow-poplar, and oaks. Seeds and seedlings survive and grow well if competing vegetation is controlled.

Slope, low strength, moderate shrink-swell potential, and a moderately permeable, clayey subsoil are the main limitations for nonfarm uses. Slope, low strength, and the shrink-swell potential limit the use of this soil as a building site, and the clayey subsoil limits excavations. When wet, the clayey subsoil limits vehicular traffic. Slope and the moderately permeable subsoil limit use of the soil as a site for septic tank absorption fields and recreational areas. The low strength and excess fines limit its use as a source of roadfill.

This soil is in capability subclass IIIe.

**19D—Cullen loam, 15 to 25 percent slopes.** This deep, moderately steep, well drained soil is on narrow convex side slopes. Slopes are commonly complex. Areas of this soil are elongated or long and winding. They range from 3 to about 10 acres.

Typically, the surface layer of this soil is reddish brown loam about 8 inches thick. The subsoil is mostly red or dark red clay and clay loam about 52 inches thick. The substratum to a depth of 67 inches is red, yellowish red, and yellowish brown loam.

Included with this soil in mapping are small areas of well drained Ashe and Hayesville soils. The Hayesville soils are on landscape positions similar to those of this Cullen soil. The Ashe soils are mainly on the more sloping positions. Also included are small areas of soils that have bedrock at a depth of about 24 inches, severely eroded soils that have a red clay or clay loam surface layer, and gullied soils. Small outcrops of rock are mainly on the lower part of slopes. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 60 inches or more. The organic matter content is low to moderate, and the natural fertility is medium. This soil is medium acid to strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are in woodland. Some areas are in permanent pasture.

This soil is poorly suited to cultivated crops. It is somewhat droughty during the growing season because of the rapid surface runoff, and crop response to lime and fertilizer is somewhat limited by the lack of moisture. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits safe operation of heavy equipment.

The slope and clayey subsoil are the main limitations for nonfarm uses. Slope limits the use of this soil as sites for buildings, septic tank absorption fields, and recreational areas. The slope and the clayey subsoil limit the use of this soil for sanitary landfills. When wet, the

clayey subsoil limits vehicular traffic. The low strength and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass IVe.

**20B3—Cullen clay loam, 2 to 7 percent slopes, severely eroded.** This soil is deep, gently sloping and well drained. It is on narrow to broad convex ridgetops of Piedmont uplands. Areas of this soil are 200 to 400 feet wide and are elongated along the ridge or highly variable in shape. They range from 5 to about 25 acres.

Typically, the surface layer of this soil is reddish brown clay loam about 4 inches thick. The subsoil is red clay loam and dark red clay about 48 inches thick. The substratum to a depth of 67 inches is mottled red, yellowish red, and yellowish brown loam.

Included with this soil in mapping are small areas of somewhat excessively drained Ashe soils, well drained Hayesville and Chester soils, and well drained to moderately well drained Meadowville soils. The Ashe, Hayesville, and Chester soils commonly are intermingled on the same landscape positions. The Meadowville soils are in shallow depressions and along drainageways. Also included are small areas of Cullen soils that have slopes of more than 7 percent. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is medium. The hazard of erosion is moderate. Tilth is fair, and the surface layer breaks up into clods if tilled when too wet. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content is low, and the natural fertility is medium. This soil commonly is strongly acid to medium acid, unless limed. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are farmed. A few small areas are in permanent pasture or woodland.

This soil is moderately well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, using cover crops and grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and control erosion. Increasing the organic matter content of this soil improves tilth, infiltration, and fertility. It reduces crusting and improves soil-seed contact.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface layer, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is moderate, especially for yellow-poplar, oaks, and pines.

Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, mowing, and girdling.

This soil is limited for most nonfarm uses. The moderately permeable, clayey subsoil and seepage are limitations for sanitary facilities. The clayey subsoil and shrink-swell potential are limitations for most building sites. This soil is fairly well suited to lawns, landscaping, and golf fairways. It is well suited to recreational development. Slope limits its use for playgrounds. Low strength and excess fines limit the use of this soil as a source of roadfill. This soil is good for use as openland and woodland wildlife habitats.

This soil is in capability subclass IIIe.

**20C3—Cullen clay loam, 7 to 15 percent slopes, severely eroded.** This soil is deep, strongly sloping, and well drained. It is on narrow convex ridgetops and convex side slopes. Areas of this soil are 100 to 300 feet wide and are elongated along the ridge or highly variable in shape. They range from 5 to about 25 acres.

Typically, the surface layer of this soil is reddish brown clay loam about 4 inches thick. The subsoil is red clay loam and dark red clay about 48 inches thick. The substratum to a depth of 67 inches is mottled red, yellowish red, and yellowish brown loam.

Included with this soil in mapping are small areas of somewhat excessively drained Ashe soils, well drained Hayesville and Chester soils, and moderately well drained Meadowville soils. The Ashe, Hayesville, and Chester soils commonly are intermingled on the same landscape positions. The Meadowville soils are in shallow depressions and along drainageways. Also included are small areas of Cullen soils that have slopes of more than 15 percent. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. Tilth is fair, and the surface layer breaks up into clods if tilled when too wet. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content is low, and the natural fertility is medium. This soil commonly is strongly acid through medium acid, unless limed. Bedrock is generally at a depth of more than 5 feet.

Some areas of this soil are farmed. Most areas are in permanent pasture or woodland.

This soil is poorly suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, using cover crops and grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and control erosion. Increasing the organic matter content of this soil improves tilth,

infiltration, and fertility. It also reduces crusting and improves soil-seed contact.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface layer, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is moderate, especially for yellow-poplar, oaks, and pines. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, mowing, and girdling.

This soil is limited for most nonfarm uses. The slope, moderately permeable, clayey subsoil, and seepage are limitations for sanitary facilities. The slope, clayey subsoil, and shrink-swell potential are limitations for most building sites. Slope limits this soil for lawns, landscaping, and golf fairways. Low strength and excess fines limit the use of this soil as a source of roadfill. Slope limits its use for playgrounds. This soil is good for use as openland and woodland wildlife habitats.

This soil is in capability subclass IVe.

**20D3—Cullen clay loam, 15 to 25 percent slopes, severely eroded.** This soil is deep, moderately steep, and well drained. It is on side slopes of Piedmont uplands. Areas of this soil are 100 to 300 feet wide and are along the drainage pattern. They range from 5 to about 15 acres.

Typically, the surface layer of this soil is reddish brown clay loam about 4 inches thick. The subsoil is red clay loam and dark red clay about 48 inches thick. The substratum to a depth of 67 inches is mottled red, yellowish red, and yellowish brown loam.

Included with this soil in mapping are small areas of somewhat excessively drained Ashe soils, well drained Hayesville and Chester soils, and moderately well drained Meadowville soils. The Ashe, Hayesville, and Chester soils commonly are intermingled on the same landscape positions. The Meadowville soils are in shallow depressions and along drainageways. Also included are small areas of Cullen soils that have slopes of less than 15 percent. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content is low, and the natural fertility is medium. This soil commonly is strongly acid to medium acid, unless limed. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are in permanent pasture or woodland.

This soil is not suited to cultivated crops because of past erosion.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface layer, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is moderate, especially for yellow-poplar, oaks, shortleaf pine, and Virginia pine. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, mowing, and girdling.

This soil is limited for most nonfarm uses because of steep slopes. The slope and clayey subsoil are limitations for sanitary facilities. Low strength and excess fines limit the use of this soil as a source of roadfill, and slope limits its use for recreational development. This soil is good for use as woodland wildlife habitat.

This soil is in capability subclass VIe.

**21B—Culpeper fine sandy loam, 2 to 7 percent slopes.** This soil is deep, gently sloping, and well drained. It is on narrow to broad convex ridgetops. Slopes are smooth and range from about 100 to 300 feet in length. Areas of this soil commonly are oval or irregularly elongated, and they range from 3 to about 100 acres.

Typically, the surface layer is brown and yellowish brown fine sandy loam about 8 inches thick. The subsoil is 29 inches thick. It is yellowish red clay loam and red clay and sandy clay loam. The substratum is reddish yellow fine sandy loam. Hard rock is at a depth of about 50 inches.

Included with this soil in mapping are small areas of well drained Albemarle and Elioak soils and excessively drained Hazel soils. The Albemarle and Elioak soils are scattered throughout the mapped area. The Hazel soils are mainly on the steeper positions and near slope breaks. Also included are small areas of Culpeper soils that have slopes of more than 7 percent, small areas that have pebbles and cobbles in the surface layer, and small areas that are severely eroded. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Runoff is medium. The hazard of erosion is moderate. Tilth is good. The organic matter content and the natural fertility are low. Reaction commonly is very strongly acid or strongly acid throughout, but is variable in the surface layer because of local liming. The root zone extends to a depth of 36 inches. Bedrock is

generally at a depth of 50 inches or more. The subsoil has moderate shrink-swell potential.

Most areas of this soil are in woodland. Some areas are in permanent pasture, and some areas are farmed.

This soil is well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, using cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and control erosion. Increasing the organic matter content in this soil improves fertility and tilth, reduces crusting, and increases water infiltration and soil-seed contact.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface layer, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is moderately high, especially for loblolly pine, Virginia pine, yellow-poplar, and oaks. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, girdling, and mowing.

Low strength, moderate shrink-swell potential, a moderately permeable clayey subsoil, and depth to rock are the main limitations for nonfarm uses. The clayey subsoil and depth to rock are limitations for landfills and shallow excavations. The moderate shrink-swell potential is a limitation for building sites. Low strength and excess fines limit use of this soil for roadfill. The moderate permeability of the subsoil and depth to rock limit its use for septic tank absorption fields. This soil is well suited to many recreational uses. Slope limits its use for playgrounds. This soil is good for use as openland and woodland wildlife habitats.

This soil is in capability subclass IIe.

**21C—Culpeper fine sandy loam, 7 to 15 percent slopes.** This soil is deep, strongly sloping, and well drained. It is on narrow, convex ridgetops and on short side slopes. Slopes are smooth and range from about 200 to 400 feet in length. Areas of this soil commonly are long and winding, and they range from 10 to about 50 acres.

Typically, the surface layer is brown and yellowish brown fine sandy loam about 8 inches thick. The subsoil is about 29 inches thick. It is yellowish red clay loam and red clay and sandy clay loam. The substratum is reddish yellow fine sandy loam. Hard rock is at a depth of about 50 inches.

Included with this soil in mapping are small areas of well drained Albemarle and Elioak soils and excessively

drained Hazel soils. The Albemarle and Elioak soils are scattered throughout the mapped area. The Hazel soils are mainly on the steeper positions, near slope breaks, and on points of ridges. Also included are small areas of Culpeper soils that have slopes of more than 15 percent, small areas that have pebbles and cobbles in the surface layer, and small areas that are severely eroded. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Runoff is rapid, and the hazard of erosion is severe. Tilth is fair. The organic matter content and the natural fertility are low. Reaction commonly is very strongly acid or strongly acid throughout but is variable in the surface layer because of local liming. The root zone extends to a depth of about 36 inches. Bedrock is generally at a depth of 50 inches or more. The subsoil has moderate shrink-swell potential.

Most areas of this soil are in permanent pasture or woodland. Some areas are being farmed.

This soil is moderately well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, using cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and control erosion. These practices also improve fertility and tilth, reduce crusting, and increase water infiltration and soil-seed contact.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface layer, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is moderately high, especially for loblolly pine, Virginia pine, yellow-poplar, and oaks. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, girdling, and mowing.

The slope, low strength, the moderate shrink-swell potential, the moderately permeable, clayey subsoil, and depth to bedrock are the main limitations for nonfarm uses. The slope, clayey subsoil, and depth to rock limit use of this soil for landfills and shallow excavations. The slope and moderate shrink-swell potential are limitations for building sites. Low strength and excess fines limit use of this soil for roadfill. The slope, moderate permeability of the subsoil, and depth to rock limit its use for septic tank absorption fields. This soil is moderately well suited to many recreational uses. Slope limits its use for playgrounds, and the severe erosion hazard limits paths

and trails. This soil is good for use as openland and woodland wildlife habitats.

This soil is in capability subclass IIIe.

**21D—Culpeper fine sandy loam, 15 to 25 percent slopes.** This soil is deep, moderately steep, and well drained. It is on convex side slopes. Slopes are smooth and range from about 200 to 600 feet in length. Areas of this soil commonly are long and winding, and they range from 10 to about 25 acres.

Typically, the surface layer is brown and yellowish brown fine sandy loam about 8 inches thick. The subsoil is about 29 inches thick. It is yellowish red clay loam and red clay and sandy clay loam. The substratum is reddish yellow fine sandy loam. Hard rock is at a depth of about 50 inches.

Included with this soil in mapping are small areas of well drained Albemarle and Elioak soils and excessively drained Hazel soils. The Albemarle and Elioak soils are scattered throughout the mapped area. The Hazel soils are mainly on the steeper positions, near slope breaks, and on points of ridges. Also included are small areas of Culpeper soils that have slopes of less than 15 percent, small areas that have pebbles and cobbles in the surface layer, and areas that are severely eroded. Included soils make up about 20 percent of the mapped areas.

Permeability and available water capacity are moderate. Runoff is rapid, and the hazard of erosion is severe. Tilth is fair. The organic matter content and the natural fertility are low. Reaction commonly is very strongly acid or strongly acid throughout, but is variable in the surface layer because of local liming. The root zone extends to a depth of about 36 inches. Bedrock is generally at a depth of more than 48 inches. The subsoil has moderate shrink-swell potential.

Most areas of this soil are in permanent pasture or woodland. Some areas are being farmed.

This soil is poorly suited to cultivated crops. The severe hazard of erosion is a major management concern. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, using cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and control erosion. These practices also improve fertility and tilth, reduce crusting, and increase water infiltration and soil-seed contact.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface layer, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is moderately high, especially for loblolly pine, Virginia pine, yellow-poplar, and oaks. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, girdling, and mowing.

The slope, low strength, and the depth to rock are the main limitations for nonfarm uses. The slope and depth to rock limit this soil for landfills and shallow excavations. Low strength and excess fines limit its use as a source of roadfill. The moderately steep slopes limit this soil for septic tank absorption fields. Slope limits the use of this soil for recreational development. This soil is fair for use as openland wildlife habitat and good for use as woodland wildlife habitat.

This soil is in capability subclass IVe.

**22C3—Culpeper clay loam, 7 to 15 percent slopes, severely eroded.** This soil is deep, strongly sloping, and well drained. It is on narrow, convex ridgetops and short side slopes. Slopes are smooth and range from about 100 to 400 feet in length. Areas of this soil commonly are long and winding, and they range from 10 to more than 30 acres.

Typically, the surface layer is reddish brown and yellowish red clay loam about 4 inches thick. The subsoil is about 27 inches thick. It is mainly red clay and sandy clay loam. The substratum is reddish yellow fine sandy loam. Hard rock is at a depth of 50 inches.

Included with this soil in mapping are small areas of well drained Albemarle and Elioak soils and excessively drained Hazel soils. The Albemarle and Elioak soils are scattered throughout the mapped area. The Hazel soils are mainly on the steeper positions, near slope breaks, and on points of ridges. Also included are small areas of Culpeper soils that have slopes of more than 15 percent and small areas that have pebbles and cobbles in the surface layer. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Runoff is rapid, and the hazard of erosion is severe. Tilth is fair. The organic matter content and the natural fertility are low. Reaction is very strongly acid or strongly acid throughout but is variable in the surface layer because of local liming. The root zone extends to a depth of about 34 inches. Bedrock is generally at a depth of more than 48 inches. The subsoil has moderate shrink-swell potential.

Most areas of this soil are in permanent pasture or woodland. Some areas are farmed.

This soil is poorly suited to cultivated crops. The severe hazard of erosion is a major management concern. When lime and fertilizer are applied according to soil tests, crops respond moderately well. Conservation tillage, using cover crops, including grasses and legumes in the cropping system, and returning crop

residue to the soil help to maintain organic matter content and control erosion. These practices also improve fertility and tilth, reduce crusting, and increase water infiltration and soil-seed contact.

This soil is moderately well suited to pasture and hay. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface layer, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is moderate, especially for loblolly pine, Virginia pine, yellow-poplar, and oaks. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, girdling, and mowing.

The slope, low strength, the moderate shrink-swell potential, the moderately permeable clayey subsoil, and depth to bedrock are the main limitations for nonfarm uses. The slope, clayey subsoil, and depth to rock limit this soil for landfills and shallow excavations. The slope and moderate shrink-swell potential are limitations for building sites. Low strength and excess fines limit use of this soil as a source for roadfill. The slope, moderate permeability of the subsoil, and depth to rock limit this soil for septic tank absorption fields. This soil is moderately well suited to many recreational uses. Slope limits the use of this soil for playgrounds, and the hazard of erosion is severe for paths and trails. This soil is good for use as openland and woodland wildlife habitats.

This soil is in capability subclass IVe.

**23B—Davidson clay loam, 2 to 7 percent slopes.** This deep, gently sloping, well drained soil is on narrow to broad convex ridgetops of Piedmont uplands. Slopes are smooth and 100 to 500 feet long. Areas of this soil commonly are irregularly rounded or oblong. They range from 5 to about 50 acres.

Typically, the surface layer of this soil is dark reddish brown clay loam about 4 inches thick. The subsoil is mostly dark red clay about 84 inches thick. The substratum is multicolored red, strong brown, and yellowish brown greenstone saprolite that crushes to silty clay loam to a depth of 105 inches.

Included with this soil in mapping are small areas of well drained Dyke and Rabun soils. The Dyke and Rabun soils are throughout the mapped area. Also included are severely eroded areas that have a surface layer of dark red clay and small areas that have stones on the surface. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is medium. The hazard of erosion is moderate. This soil has fair tilth. The subsoil

has low shrink-swell potential. The root zone extends to a depth of 60 inches. The organic matter content is moderate, and the natural fertility is medium. This soil commonly is medium acid to strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are farmed. Some areas are in woodland.

This soil is well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, eastern white pine, yellow-poplar, and oaks do well on this soil.

The low strength, the moderately permeable subsoil, and the clayey texture of the subsoil are the main limitations for nonfarm uses. The low strength limits use of the soil for local roads and streets, and the clayey subsoil limits excavations. The clayey, moderately permeable subsoil limits the use of the soil for sanitary facilities. Slope is a limitation for playgrounds. The soil is poor as a source of roadfill.

This soil is in capability subclass IIe.

### **23C—Davidson clay loam, 7 to 15 percent slopes.**

This deep, strongly sloping, well drained soil is on narrow convex ridgetops and convex side slopes. Slopes are smooth and 150 to 500 feet long. Areas of this soil commonly are long and winding. They range from 5 to about 25 acres.

Typically, the surface layer of this soil is dark reddish brown clay loam about 4 inches thick. The subsoil is mostly dark red clay about 84 inches thick. The substratum to a depth of 105 inches is multicolored red, strong brown, and yellowish brown greenstone saprolite that crushes to silty clay loam.

Included with this soil in mapping are small areas of well drained Dyke, Rabun, and Starr soils. The Dyke and Rabun soils are throughout the mapped area. The Starr soils are on foot slopes and along small drainageways. Also included are small areas of soils that are severely eroded and have a dark red clay surface layer and small

areas that have stones on the surface. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. This soil has fair tilth. The subsoil has low shrink-swell potential. The root zone extends to a depth of 60 inches. The organic matter content is moderate, and the natural fertility is medium. This soil commonly is medium acid to strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are farmed. A few areas are in woodland.

This soil is moderately well suited to cultivated crops. The severe hazard of erosion is a major management concern. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high, especially for loblolly pine, eastern white pine, yellow-poplar, and oaks. Seeds and seedlings survive and grow well if competing vegetation is controlled.

The slope, the low strength, and the clayey, moderately permeable subsoil are the main limitations for nonfarm uses. Low strength limits the use of this soil for local roads and streets. The slope and the clayey subsoil limit excavations. The slope and the clayey, moderately permeable subsoil limit use of the soil for most sanitary facilities. Slope is a limitation for recreational development. Low strength and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass IIIe.

**24B—Dogue silt loam, 2 to 7 percent slopes.** This deep, gently sloping, moderately well drained soil is on broad terraces along the larger streams. Areas of this soil are elongated, or irregularly rounded, and are slightly concave. They range from 3 to about 20 acres.

Typically, the surface layer of this soil is dark yellowish brown silt loam about 10 inches thick. The subsoil is mostly yellowish brown clay and clay loam about 42 inches thick. It has gray mottles below a depth of 24 inches. The substratum to a depth of 70 inches is strong brown clay loam and has light gray mottles.

Included with this soil in mapping are small areas of well drained McQueen soils and somewhat poorly drained Wahee soils. The Wahee soils are in depressions and along small drainageways. The McQueen soils are on slightly higher positions throughout the mapped area. Included soils make up about 15 percent of mapped areas.

Permeability is moderately slow, and available water capacity is high. Surface runoff is medium. The hazard of erosion is moderate. This soil has good tilth. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 60 inches. The organic matter content is low, and the natural fertility is medium. This soil commonly is strongly acid to very strongly acid, but reaction of the surface layer is variable because of local liming. A seasonal high water table is at a depth of 1 1/2 to 3 feet during winter and spring. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are farmed. Some areas are in woodland.

This soil is well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and crops. Alfalfa is short lived because of seasonal wetness. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees is high, especially for loblolly pine, Virginia pine, yellow-poplar, and oaks. Seeds and seedlings survive and grow well if competing vegetation is controlled.

The shallow depth to the seasonal high water table, the moderate shrink-swell potential, the low strength, and a clayey, slowly permeable subsoil are the main limitations for nonfarm uses. The seasonal high water table limits use of this soil as a site for sanitary landfills. Low strength and the shrink-swell potential limit its use as a building site, and the clayey subsoil limits excavations. When wet, the clayey subsoil is soft and is a limitation for local roads and streets. The slowly permeable subsoil limits use of this soil for septic tank absorption fields. Low strength and excess fines limit this soil's use as a source of roadfill.

This soil is in capability subclass IIe.

**25B—Dyke silt loam, 2 to 7 percent slopes.** This deep, gently sloping, well drained soil is on broad, convex foot slopes and colluvial fans. Slopes are smooth and are about 300 to 1,000 feet long. Areas of this soil

are long and wide. They range from 5 to about 30 acres (fig. 6).

Typically, the surface layer of this soil is dark reddish brown silt loam about 8 inches thick. The upper 35 inches of the subsoil is dark red clay loam and clay, and the lower part to a depth of 60 inches or more is dark red clay.

Included with this soil in mapping are small areas of well drained Braddock, Davidson, Rabun, and Unison soils. These soils are throughout the mapped area. Also included are small areas of severely eroded soils that have a clay loam surface layer and small areas that have a very stony surface layer. Included soils make up about 15 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is medium. The hazard of erosion is moderate. This soil has good tilth. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content is low, and the natural fertility is medium. This soil commonly is strongly acid or very strongly acid throughout, unless limed. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are farmed and in cultivated crops or hay.

This soil is well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

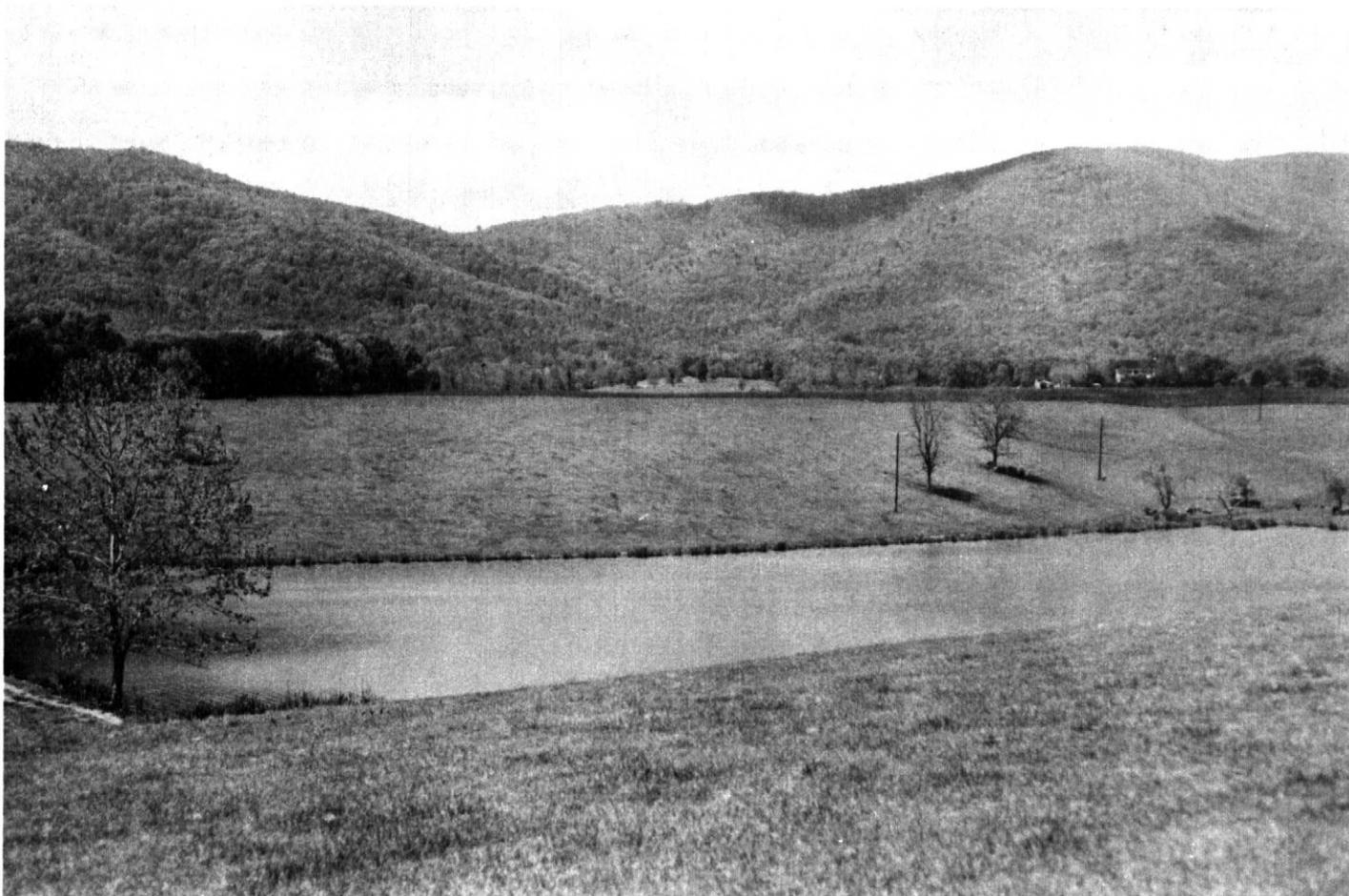
This soil is well suited to pasture and hay crops (fig. 7). Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. The soil is managed mostly for mixed hardwoods. Seeds and seedlings survive and grow well if competing vegetation is controlled.

The low strength, a moderately permeable, clayey subsoil, and the moderate shrink-swell potential are the main limitations for nonfarm uses. Low strength, the shrink-swell potential, and the clayey subsoil limit use of this soil as a building site. The clayey subsoil and moderately permeable subsoil limit its use as a site for some sanitary facilities. Slope is a limitation for playgrounds. Low strength and excess fines limit use of this soil as a source of roadfill.

This soil is in capability subclass IIe.

**25C—Dyke silt loam, 7 to 15 percent slopes.** This deep, strongly sloping, well drained soil is on convex side slopes of colluvial fans. Slopes are smooth and



**Figure 6.—An area of Dyke silt loam, 2 to 7 percent slopes, in foreground. Braddock clay loam, 7 to 15 percent slopes, severely eroded, in the area between the pond and the trees. The pond was designed and constructed to overcome the moderate seepage limitation in the Dyke soil.**

about 300 to 600 feet long. Most areas of this soil are long and narrow. They range from 5 to 30 acres or more.

Typically, the surface layer of this soil is dark reddish brown silt loam about 8 inches thick. The upper 35 inches of the subsoil is dark red clay loam and clay, and the lower part to a depth of 60 inches or more is dark red clay.

Included with this soil in mapping are small areas of well drained Braddock, Davidson, Rabun, and Unison soils. These soils are throughout the mapped area. Also included are small areas of severely eroded soils that have a clay loam surface layer and small areas that have a very stony surface layer. Included soils make up about 15 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion

is severe. This soil has good tilth. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content is low, and the natural fertility is medium. This soil commonly is strongly acid or very strongly acid throughout, unless limed. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are farmed and in cultivated crops or hay.

This soil is moderately well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and



Figure 7.—Alfalfa seeded late in summer on Dyke silt loam, 2 to 7 percent slopes, is being irrigated to increase growth before winter.

help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. The soil is managed mostly for mixed hardwoods. Seeds and seedlings survive and grow well if competing vegetation is controlled. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion.

The low strength, a moderately permeable, clayey subsoil, the moderate shrink-swell potential, and the slope are the main limitations for nonfarm uses. Low strength, slope, shrink-swell potential, and the clayey subsoil limit use of this soil as a building site. The clayey subsoil, slope, and the moderately permeable subsoil limit the use of this soil as a site for most sanitary facilities. Slope is a limitation for most recreational

development. Low strength and excess fines limit use of this soil as a source of roadfill.

This soil is in capability subclass IIe.

**26B3—Dyke clay loam, 2 to 7 percent slopes, severely eroded.** This deep, gently sloping, well drained soil is on broad, convex foot slopes and colluvial fans. Slopes are smooth and about 100 to 500 feet long. Areas of this soil are long and narrow. They range from 5 to about 15 acres.

Typically, the surface layer of this soil is dark red clay loam about 4 inches thick. The subsoil to depth of 60 inches or more is dark red clay.

Included with this soil in mapping are small areas of well drained Braddock, Davidson, Rabun, and Unison soils. These soils are throughout the mapped area. They make up about 15 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is medium. The hazard of erosion is moderate. The surface layer is firm, and tilth is fair. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content is low, and the natural fertility is medium.

This soil is strongly acid or very strongly acid throughout, unless limed. Bedrock generally is at a depth of more than 5 feet.

Most areas of this soil are farmed and in cultivated crops or hay.

This soil is moderately well suited to cultivated crops. The moderate hazard of erosion and the damage of past erosion are major management concerns. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. The soil is managed mostly for mixed hardwoods. Seeds and seedlings survive and grow well if competing vegetation is controlled.

The low strength, a moderately permeable, clayey subsoil, and the moderate shrink-swell potential are the main limitations for nonfarm uses. Low strength, the shrink-swell potential, and the clayey subsoil limit use of this soil as a building site. The clayey, moderately permeable subsoil limits this soil as a site for some sanitary facilities. Slope is a limitation for playgrounds. Low strength and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass IIIe.

**26C3—Dyke clay loam, 7 to 15 percent slopes, severely eroded.** This deep, strongly sloping, well drained soil is on convex side slopes of colluvial fans. Slopes are smooth and about 200 to 400 feet long. Areas of this soil are long and narrow. They range from 5 to about 30 acres.

Typically, the surface layer of this soil is dark red clay loam about 4 inches thick. The subsoil to a depth of 60 inches or more is dark red clay.

Included with this soil in mapping are small areas of well drained Braddock, Davidson, Rabun, and Unison soils. These soils are throughout the mapped area. They make up about 15 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. The surface layer is firm, and tilth is fair. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content is low, and the natural fertility is medium. This soil commonly is strongly acid or very strongly acid

throughout, unless limed. Bedrock is generally at a depth of more than 5 feet.

Some areas of this soil are in cultivated cropland. Some areas are in pasture.

This soil is poorly suited to cultivated crops. The severe hazard of erosion and the damage of past erosion are major management concerns. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase infiltration.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. The soil is managed mostly for mixed hardwoods. Seeds and seedlings survive and grow well if competing vegetation is controlled. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion.

The low strength, the moderately permeable, clayey subsoil, the moderate shrink-swell potential, and the slope are the main limitations for nonfarm uses. Low strength, slope, shrink-swell potential, and the clayey subsoil limit use of this soil as a building site. The clayey, moderately permeable subsoil and slope are limitations for most sanitary facilities. Slope is a limitation for most recreational development. Low strength and excess fines limit use of this soil as a source of roadfill.

This soil is in capability subclass IVe.

**26D3—Dyke clay loam, 15 to 25 percent slopes, severely eroded.** This deep, moderately steep, well drained soil is on convex side slopes of colluvial ridges. Slopes are smooth and are about 100 to 400 feet long. Areas of this soil are long and narrow. They range from 5 to about 20 acres.

Typically, the surface layer of this soil is dark red clay loam about 4 inches thick. The subsoil to a depth of 60 inches or more is dark red clay.

Included with this soil in mapping are small areas of well drained Braddock, Hayesville, and Rabun soils. These soils are throughout the mapped area. Also included are small areas of noneroded soils that have a silt loam surface layer and small areas that have slopes of more than 25 percent. Included soils make up about 15 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches.

The organic matter content is low, and the natural fertility is medium. This soil commonly is strongly acid or very strongly acid throughout, unless limed. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are in pasture. A few areas are in woodland.

This soil is not suited to cultivated crops because of past erosion.

Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. The soil is managed mostly for mixed hardwoods. Seeds and seedlings survive and grow well if competing vegetation is controlled. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion.

The slope and the clayey subsoil are the main limitations for nonfarm uses. Slope limits use of the soil as a building site. The slope and the clayey subsoil are limitations for most sanitary facilities. Slope is a limitation for recreational development. Low strength and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass VIe.

**27B—Elloak loam, 2 to 7 percent slopes.** This soil is deep, gently sloping, and well drained. It is on broad to narrow convex ridgetops that are about 200 feet to 600 feet wide. Slopes commonly are smooth. Areas of this soil are along the ridges and commonly are irregularly elongated. They range from 5 to about 50 acres.

Typically, the surface layer of this soil is dark brown and reddish brown loam about 8 inches thick. The subsoil is about 41 inches thick. It is yellowish red silty clay loam and red silty clay in the upper part and red silty clay loam and silt loam in the lower part. The substratum to a depth of 72 inches is mottled strong brown, yellowish red, and reddish brown silt loam.

Included with this soil in mapping are small areas, generally less than 2 acres, of well drained Glenelg soils and excessively drained Hazel soils. The Glenelg soils are throughout the mapped area but mainly are on the concave slopes. The Hazel soils are mainly on steeper slopes. Also included are small areas of soils that have a gravelly surface layer and small severely eroded areas that have a yellowish red clay loam or silty clay loam surface layer. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is medium. The hazard of erosion is moderate. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content and the natural fertility are low. This soil is very strongly acid to medium

acid throughout, but reaction in the surface layer is variable because of liming. Bedrock is generally at a depth of more than 5 feet.

Many areas of this soil are being farmed. Some areas are in woodland, and some are in permanent pasture.

This soil is well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and control erosion. Increasing the organic matter content of this soil improves tilth, infiltration, and fertility. It also reduces crusting and improves soil-seed contact.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface layer and increases runoff and erosion.

The potential productivity for trees on this soil is high, especially for oak, yellow-poplar, Virginia pine, and shortleaf pine. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, girdling, and mowing.

This soil is moderately limited for many nonfarm uses. The slope, the moderately permeable, clayey subsoil, and seepage are limitations for sanitary facilities. Permeability is a limitation for septic tank absorption fields. This soil is moderately limited for area type sanitary landfills. The clayey subsoil, low strength, and potential frost action are limitations for many nonfarm uses. The excess fines and thin layers limit this soil as a source of roadfill. This soil is well suited to some types of recreational development. Slope limits its use as playgrounds. It is good for use as openland and woodland wildlife habitats.

This soil is in capability subclass IIe.

**27C—Elloak loam, 7 to 15 percent slopes.** This soil is deep, strongly sloping, and well drained. It is on convex ridgetops and side slopes that are about 200 to 400 feet wide. Slopes commonly are smooth. Areas of this soil are along the ridges and commonly are long and winding. They range from 5 to about 100 acres.

Typically, the surface layer of this soil is dark brown and reddish brown loam about 8 inches thick. The subsoil is about 41 inches thick. It is yellowish red silty clay loam and red silty clay in the upper part and red silty clay loam and silt loam in the lower part. The substratum to a depth of 72 inches is mottled strong brown, yellowish red, and reddish brown silt loam.

Included with this soil in mapping are small areas, generally less than 2 acres, of well drained Glenelg soils and excessively drained Hazel soils. The Glenelg soils are throughout the mapped area but are mainly on the concave slopes. The Hazel soils mainly have steeper slopes and are near slope breaks. Also included are small areas that have a gravelly surface layer and small severely eroded areas that have a yellowish red clay loam or silty clay loam surface layer. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content and the natural fertility are low. This soil commonly is very strongly acid to medium acid throughout, but reaction in the surface layer is variable because of liming. Bedrock generally is at a depth of more than 5 feet.

Most areas of this soil are in woodland or in permanent pasture. A few areas are farmed.

This soil is moderately well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and control erosion. Additions of organic matter improve tilth, infiltration, and fertility. They also reduce crusting and improve soil-seed contact.

This soil is well suited to pasture and moderately well suited to hay crops. Establishing and maintaining a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface layer and increases runoff and erosion.

The potential productivity for trees on this soil is high, especially for oak, yellow-poplar, Virginia pine, and shortleaf pine. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, girdling, and mowing.

This soil is moderately limited for many nonfarm uses. The slope, the moderately permeable clayey subsoil, and seepage are limitations for sanitary facilities. Permeability is a limitation for septic tank absorption fields. This soil is moderately limited for area type sanitary landfills. The clayey subsoil, low strength, and potential frost action are limitations for community development. The excess fines and thin layers limit this soil as a source of roadfill. This soil is limited for some types of recreational development. The slope limits its use as playgrounds. This soil is good for use as openland and woodland wildlife habitats.

This soil is in capability subclass IIIe.

**27D—Elloak loam, 15 to 25 percent slopes.** This soil is deep, moderately steep, and well drained. It is on side slopes that are about 200 to 400 feet wide. Slopes commonly are smooth. Areas of this soil are along ridges and commonly are long and winding. They range from 5 to about 50 acres.

Typically, the surface layer of this soil is dark brown and reddish brown loam about 8 inches thick. The subsoil is about 41 inches thick. It is yellowish red silty clay loam and red silty clay in the upper part and red silty clay loam and silt loam in the lower part. The substratum to a depth of 72 inches is mottled strong brown, yellowish red, and reddish brown silt loam.

Included with this soil in mapping are small areas, generally less than 2 acres, of well drained Glenelg soils and excessively drained Hazel soils. The Glenelg soils are throughout the mapped area but are mainly on the concave slopes. The Hazel soils mainly have steeper slopes and are near slope breaks. Also included are small areas that have a gravelly surface layer and small severely eroded areas that have a yellowish red clay loam or silty clay loam surface. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content and the natural fertility are low. This soil commonly is very strongly acid to medium acid throughout, but reaction in the surface layer is variable because of liming. Bedrock generally is at a depth of more than 5 feet.

Most areas of this soil are in woodland or in permanent pasture. A few areas are being farmed.

This soil is poorly suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and control erosion. Additions of organic matter improve tilth, infiltration, and fertility. They also reduce crusting and improve soil-seed contact.

This soil is moderately well suited to pasture and poorly suited to hay crops. Establishing and maintaining a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface layer and increases runoff and erosion.

The potential productivity for trees on this soil is high, especially for oak, yellow-poplar, Virginia pine, and shortleaf pine. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site

preparation, including cutting, spraying, girdling, and mowing.

This soil is severely limited for many nonfarm uses. The moderately steep slope is a limitation for most sanitary facilities. The slope, excess fines, and thin layers limit this soil as a source of roadfill. The slope limits the use of this soil for recreational development. This soil is fair for use as openland wildlife habitat and good for use as woodland wildlife habitat.

This soil is in capability subclass IVe.

**28C3—Elloak clay loam, 7 to 15 percent slopes, severely eroded.** This soil is deep, strongly sloping, and well drained. It is on convex ridgetops and side slopes that are about 200 to 400 feet wide. Slopes commonly are smooth. Areas of this soil are along the ridges and commonly are irregularly elongated. They range from 5 to about 20 acres.

Typically, the surface layer of this soil is yellowish red clay loam about 4 inches thick. The subsoil is about 33 inches thick. It is red silty clay in the upper part and red silty clay loam and silt loam in the lower part. The substratum to a depth of 64 inches is mottled strong brown, yellowish red, and reddish brown silt loam.

Included with this soil in mapping are small areas, generally less than 2 acres, of well drained Glenelg soils and excessively drained Hazel soils. The Glenelg soils are throughout the mapped area but are mainly on the concave slopes. The Hazel soils mainly have steeper slopes and are near slope breaks. Also included are small areas that have a gravelly surface layer and areas that have slopes of more than 15 percent or less than 7 percent. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe, and past erosion has reduced the range of moisture content for good workability. This soil has fair tilth. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content and the natural fertility are low. This soil commonly is very strongly acid to medium acid throughout, but reaction in the surface layer is variable because of liming. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are in woodland or in permanent pasture. A few areas are being farmed.

This soil is poorly suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and control erosion. Additions of organic matter improve tilth, infiltration, and fertility. They also reduce crusting and improve soil-seed contact.

This soil is moderately well suited to pasture and poorly suited to hay crops. Establishing and maintaining

a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface layer and increases runoff and erosion. It also reduces plant growth.

The potential productivity for trees on this soil is high, especially for oak, yellow-poplar, Virginia pine, and shortleaf pine. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, girdling, and mowing.

This soil is moderately limited for many nonfarm uses. The slope, moderately permeable, clayey subsoil, and seepage are limitations for sanitary facilities. Permeability is a limitation for septic tank absorption fields. This soil is moderately limited for area type sanitary landfills. The clayey subsoil, low strength, and potential frost action are limitations for many kinds of community development. The excess fines and thin layers limit this soil as a source of roadfill. This soil is limited for some types of recreational development. The slope limits its use as playgrounds. This soil is good for use as openland and woodland wildlife habitats.

This soil is in capability subclass IVe.

**28D3—Elloak clay loam, 15 to 25 percent slopes, severely eroded.** This soil is deep, moderately steep, and well drained. It is on side slopes that are about 200 to 400 feet wide. Slopes commonly are smooth. Areas of this soil are along ridges and commonly are irregularly elongated. They range from 5 to about 20 acres.

Typically, the surface layer of this soil is yellowish red clay loam about 4 inches thick. The subsoil is about 33 inches thick. It is red silty clay in the upper part and red silty clay loam and silt loam in the lower part. The substratum to a depth of 64 inches is strong brown, yellowish red, and reddish brown silt loam.

Included with this soil in mapping are small areas, generally less than 2 acres, of well drained Glenelg soils and excessively drained Hazel soils. The Glenelg soils are throughout the mapped area but are mainly on the concave slopes. The Hazel soils are mainly on steeper slopes. Also included are small areas of soils that have a gravelly surface layer and small areas that have slopes of more than 25 percent or less than 7 percent. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content and the natural fertility are low. This soil commonly is very strongly acid to medium acid throughout, but reaction in the surface layer is

variable because of liming. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are in woodland or in permanent pasture. A few areas are being farmed.

This soil is not suited to cultivated crops or hay because of past erosion.

This soil is moderately well suited to pasture crops. Establishing and maintaining a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface layer and increases runoff and erosion. It also reduces plant growth.

The potential productivity for trees on this soil is high, especially for oak, yellow-poplar, Virginia pine, and shortleaf pine. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, girdling, and mowing.

This soil is severely limited for many nonfarm uses. The moderately steep slope is a limitation for most sanitary facilities. The slope, excess fines, and thin layers limit this soil as a source of roadfill. The slope limits the use of this soil for recreational development. This soil is fair for use as openland wildlife habitat and good for use as woodland wildlife habitat.

This soil is in capability subclass VIe.

**29B—Fauquier silt loam, 2 to 7 percent slopes.** This deep, gently sloping, well drained soil is on narrow to broad convex ridgetops. Slopes are smooth and are 300 to 500 feet long. Areas of this soil commonly are irregularly rounded or oblong. They range from 3 to about 15 acres.

Typically, the surface layer of this soil is reddish brown silt loam about 6 inches thick. The subsoil is mostly red clay or silty clay about 28 inches thick. The substratum to a depth of 60 inches is mostly red, highly weathered greenstone that crushes to silt loam or silty clay loam.

Included with this soil in mapping are small areas of well drained Myersville and Rabun soils. These soils are on landscape positions similar to those of this Fauquier soil. Also included are small areas of soils in which bedrock is at a depth of about 24 inches and severely eroded areas that have a surface layer of red silty clay loam. Included soils make up about 15 percent of mapped areas.

Permeability is moderate, and available water capacity is high. Surface runoff is medium. The hazard of erosion is moderate. This soil has good tilth. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 30 inches or more. The organic matter content is low to moderate, and the natural fertility is medium. This soil commonly is medium acid or strongly

acid throughout, but reaction in the surface layer is variable because of local liming. Hard rock is at a depth of more than 40 inches.

Most areas of this soil are farmed. Some areas are in woodland.

This soil is well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

The soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is very high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil.

The low strength, the moderate shrink-swell potential, the depth to rock, the clayey texture of the subsoil, and the moderately permeable subsoil are the main limitations for nonfarm uses. The low strength and the shrink-swell potential limit use of the soil as a building site, and the clayey subsoil limits excavations. When wet, the clayey subsoil limits vehicular traffic. The moderately permeable subsoil and depth to rock limit use of the soil for most sanitary facilities. Low strength and excess fines limit the soil as a source of roadfill.

This soil is in capability subclass IIe.

**29C—Fauquier silt loam, 7 to 15 percent slopes.** This deep, strongly sloping, well drained soil is on narrow convex ridgetops and on convex side slopes. Slopes are smooth and are 300 to 500 feet long. Areas of this soil commonly are long and winding. They range from 5 to about 20 acres.

Typically, the surface layer of this soil is reddish brown silt loam about 6 inches thick. The subsoil is mostly red clay or silty clay about 28 inches thick. The substratum is mostly red highly weathered greenstone that crushes to silt loam or silty clay loam.

Included with this soil in mapping are small areas of well drained Myersville and Rabun soils. These soils are on landscape positions similar to those of this Fauquier soil. Also included are small areas of soils in which bedrock is at a depth of about 24 inches and small areas of severely eroded soils that have a red silty clay loam surface layer. Included soils make up about 15 percent of mapped areas.

Permeability is moderate, and available water capacity is high. Surface runoff is rapid. The hazard of erosion is severe. The subsoil has moderate shrink-swell potential.

The root zone extends to a depth of 30 inches. The organic matter content is low to moderate, and the natural fertility is medium. This soil commonly is medium acid or strongly acid throughout, but reaction in the surface layer is variable because of local liming. Depth to bedrock is more than 40 inches.

Most areas of this soil are farmed. A few areas are in woodland.

This soil is moderately well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is very high, especially for loblolly pine, Virginia pine, yellow-poplar, and oaks. Seeds and seedlings survive and grow well if competing vegetation is controlled.

The slope, the low strength, the moderate shrink-swell potential, the depth to rock, and the moderately permeable, clayey subsoil are the main limitations for nonfarm uses. The slope, the low strength, and the shrink-swell potential limit the use of this soil as a building site, and the clayey subsoil limits excavations. When wet, the clayey subsoil limits vehicular traffic. The slope, the depth to rock, and the moderately permeable subsoil limit use of the soil for most sanitary facilities. Low strength and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass IIIe.

#### **29D—Fauquier silt loam, 15 to 25 percent slopes.**

This deep, moderately steep, well drained soil is on convex side slopes. Slopes are smooth and 400 to 800 feet long. Areas of this soil are elongated or long and winding. They range from 5 to about 20 acres or more.

Typically, the surface layer of this soil is reddish brown silt loam about 6 inches thick. The subsoil is mostly red clay or silty clay about 28 inches thick. The substratum to a depth of 60 inches is mostly red, highly weathered greenstone that crushes to silt loam or silty clay loam.

Included with this soil in mapping are small areas of well drained Catoctin, Myersville, and Rabun soils. The Catoctin soils are mainly on the more sloping positions and around outcrops of rock. The Myersville and Rabun soils are scattered throughout the mapped area. Also included are small areas of severely eroded soils that have a red silty clay loam surface layer, small areas of

gullied soils, and small areas of outcrops of rock. The included soils and outcrops make up about 15 percent of mapped areas.

Permeability is moderate, and available water capacity is high. Surface runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 30 inches. The organic matter content is low to moderate, and the natural fertility is medium. This soil is medium acid or strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 40 inches.

Most areas of this soil are in woodland.

This soil is poorly suited to cultivated crops. It is somewhat droughty during the growing season because of the rapid surface runoff, and crop response to lime and fertilizer is somewhat limited by this lack of moisture. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is very high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and to help control erosion. The slope limits safe operation of heavy equipment.

The slope, the depth to rock, and the clayey subsoil are the main limitations for nonfarm uses. The slope limits use of this soil as sites for buildings, for septic tank absorption fields, and for recreational areas. Slope, the depth to rock, and the clayey subsoil limit use of the soil for some sanitary facilities. When wet, the clayey subsoil limits vehicular traffic. Low strength and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass IVe.

#### **29E—Fauquier silt loam, 25 to 45 percent slopes.**

This deep, steep, well drained soil is on convex side slopes. Slopes are smooth and 400 to 800 feet long. Areas of this soil are elongated or long and winding. They range from 5 to 20 acres or more.

Typically, the surface layer of this soil is reddish brown silt loam about 6 inches thick. The subsoil is mostly red clay or silty clay about 28 inches thick. The substratum

to a depth of 60 inches is mostly red, highly weathered greenstone that crushes to silt loam or silty clay loam.

Included with this soil in mapping are small areas of well drained Catoctin, Myersville, and Rabun soils. The Catoctin soils are mainly on the more sloping positions and around outcrops of rock. The Myersville and Rabun soils are scattered throughout the mapped areas. Also included are small areas of severely eroded soils that have a red silty clay loam surface layer, small areas of gullied soils, and small areas of outcrops of rock. The included soils and outcrops make up about 15 percent of mapped areas.

Permeability is moderate, and available water capacity is high. Surface runoff is very rapid. The hazard of erosion is very severe. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 30 inches. The organic matter content is low to moderate, and the natural fertility is medium. This soil is medium acid or strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 40 inches.

Most areas of this soil are in woodland.

This soil is not suited to cultivated crops. The steep slope makes use of modern tillage equipment impractical. The soil is somewhat droughty during the growing season because of the very rapid surface runoff, and plant response to lime and fertilizer is somewhat limited by this lack of moisture.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is very high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits safe operation of heavy equipment.

The slope, the depth to rock, and the clayey subsoil are the main limitations for nonfarm uses. Slope limits use of this soil as a site for buildings, for septic tank absorption fields, and for recreational areas. The slope, the depth to rock, and the clayey subsoil limit use of the soil for some sanitary facilities. When wet, the clayey subsoil limits vehicular traffic. Slope, low strength, and excess fines limit the soil as a source of roadfill.

This soil is in capability subclass VIe.

**30C3—Fauquier silty clay loam, 7 to 15 percent slopes, severely eroded.** This soil is deep, strongly sloping, and well drained. It is on narrow convex ridgetops and convex side slopes. Slopes are smooth

and 300 to 500 feet long. Areas of this soil are 100 to 300 feet wide and are elongated or highly variable in shape along the ridges. They range from 5 to about 25 acres.

Typically, the surface layer of this soil is red silty clay loam about 4 inches thick. The subsoil is about 24 inches thick. It is mostly red clay and silty clay. The substratum to a depth of 56 inches is red, highly weathered greenstone that crushes to silt loam or silty clay loam.

Included with this soil in mapping are small areas of well drained Catoctin, Myersville, Rabun, and Starr soils. The Catoctin soils are on the steeper positions and around the outcrops of rock. The Myersville and Rabun soils commonly are intermingled and on the same landscape positions as this Fauquier soil. The Starr soils are in shallow depressions and along drainageways. Also included are small areas of soils that have slopes of more than 15 percent. Included soils make up about 20 percent of mapped areas.

Permeability is moderate, and available water capacity is high. Surface runoff is rapid. The hazard of erosion is severe. Tillage is poor, and the surface layer breaks up into clods if tilled when too wet. The subsoil has moderate shrink-swell potential. The organic matter content is low, and the natural fertility is medium. This soil commonly is strongly acid or medium acid, unless limed. Bedrock is generally at a depth of more than 40 inches.

Some areas of this soil are farmed. Most areas are in permanent pasture or woodland.

This soil is poorly suited to cultivated crops. The severe hazard of erosion and the damage of past erosion are major management concerns. When lime and fertilizer are applied according to soil tests, crops respond moderately well. Conservation tillage, using cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and control erosion. Increasing the organic matter content of this soil improves tillage, infiltration, and fertility. It also helps reduce crusting and improve soil-seed contact.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface layer, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is moderately high, especially for oaks, loblolly pine, and Virginia pine. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, mowing, and girdling.

This soil is limited for most nonfarm uses. Slope, depth to rock, moderately permeable, clayey subsoil, and seepage are limitations for sanitary facilities. The slope, the clayey subsoil, and the moderate shrink-swell potential are limitations for most building sites. Slope limits this soil for lawns, landscaping, and golf fairways. Low strength and excess fines limit its use as a source of roadfill. Slope limits this soil for use as playgrounds. This soil is good for use as openland and woodland wildlife habitats.

This soil is in capability subclass IVe.

**30D3—Fauquier silty clay loam, 15 to 25 percent slopes, severely eroded.** This soil is deep, moderately steep and well drained. It is on narrow convex ridgetops and convex side slopes. Slopes are smooth and 300 to 500 feet long. Areas of this soil are 100 to 200 feet wide and are elongated along the ridge or highly variable in shape. They range from 5 to about 25 acres.

Typically, the surface layer of this soil is red silty clay loam about 4 inches thick. The subsoil is about 24 inches thick. It is mostly red clay and silty clay. The substratum to a depth of 56 inches is red, highly weathered greenstone that crushes to silt loam or silty clay loam.

Included with this soil in mapping are small areas of well drained Catoctin, Myersville, and Rabun soils. The Catoctin soils are on the steeper positions and around the outcrops of rock. The Myersville and Rabun soils commonly are intermingled and on the same landscape positions as this Fauquier soil. Also included are small areas of soils that have slopes of more than 25 percent. Included soils make up about 25 percent of mapped areas.

Permeability is moderate, and available water capacity is high. Surface runoff is rapid. The hazard of erosion is severe. Tillage is poor, and the surface layer breaks into clods if tilled when too wet. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 30 inches. The organic matter content is low, and the natural fertility is medium. This soil is strongly acid to medium acid, unless limed. Bedrock is generally at a depth of more than 40 inches.

Most areas of this soil are in permanent pasture or woodland. Some small areas are farmed.

This soil is not suited to cultivated crops because of the severe hazard of erosion and the damage of past erosion.

This soil is poorly suited to pasture and hay crops. Establishing and maintaining a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface layer, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is moderately high, especially for oaks, loblolly pine, and Virginia pine. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, mowing, and girdling.

This soil is limited for most nonfarm uses. Slope, depth to rock, moderately permeable clayey subsoil, and seepage are limitations for sanitary facilities. The slope, clayey subsoil, and moderate shrink-swell potential are limitations for most building sites. Slope limits this soil for lawns, landscaping, and golf fairways. Low strength and excess fines limit its use as a source of roadfill. Slope limits the use of this soil as playgrounds. This soil is good for use as openland and woodland wildlife habitats.

This soil is in capability subclass VIe.

**31C—Fauquier very stony silt loam, 7 to 15 percent slopes.** This deep, strongly sloping, well drained soil is on narrow convex ridgetops, and convex side slopes. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Slopes are smooth and 300 to 900 feet long. Areas of this soil are adjacent to drainageways and commonly are long and winding. They range from 3 to about 20 acres.

Typically, the surface layer of this soil is reddish brown silt loam about 6 inches thick. The subsoil is mostly red clay or silty clay about 28 inches thick. The substratum to a depth of 60 inches or more is red silt loam or silty clay loam mottled in shades of red, yellow, brown, and black.

Included with this soil in mapping are small areas of well drained Catoctin, Myersville, and Rabun soils. The Catoctin soils are mainly near the breaks to steeper soils and around outcrops of rock. The Myersville and Rabun soils are throughout the mapped area. Also included are small areas of severely eroded soils that have a silty clay loam surface layer, soils that do not have stones on the surface, and soils that have slopes of less than 7 percent. Included soils make up about 20 percent of mapped areas.

Permeability is moderately slow, and available water capacity is high. Surface runoff is rapid. The hazard of erosion is severe. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 30 inches. The organic matter content is low to moderate, and the natural fertility is medium. This soil commonly is strongly acid or medium acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 40 inches.

Most areas of this soil are in woodland.

This soil is not suited to hay and cultivated crops. Stones on the surface make use of modern equipment impractical.

This soil is moderately well suited to pasture crops. Establishing and maintaining a mixture of grasses and

legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is very high, especially for loblolly pine, Virginia pine, yellow-poplar, and oaks. Seeds and seedlings survive and grow well if competing vegetation is controlled.

The slope, the low strength, the moderate shrink-swell potential, the slowly permeable, clayey subsoil, and the depth to rock are the main limitations for nonfarm uses. Slope, low strength, and shrink-swell potential limit use of this soil as a building site, and the clayey subsoil limits excavations. When wet, the clayey subsoil limits vehicular traffic. The slope, the depth to rock, and the slowly permeable, clayey subsoil limit use of the soil for most sanitary facilities. Slope and large stones are limitations for recreational areas.

This soil is in capability subclass VIs.

**31D—Fauquier very stony silt loam, 15 to 25 percent slopes.** This deep, moderately steep, well drained soil is on narrow convex ridgetops and convex side slopes. Most side slopes are complex and commonly long and winding. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Areas of this map unit range from 5 to about 30 acres.

Typically, the surface layer of this soil is reddish brown silt loam about 6 inches thick. The subsoil is mostly red clay or silty clay about 28 inches thick. The substratum to a depth of 60 inches is red, highly weathered greenstone that crushes to silt loam or silty clay loam.

Included with this soil in mapping are small areas of well drained Catoctin, Myersville, and Rabun soils. The Catoctin soils are mainly on breaks to steeper soils and around outcrops of rock. The Myersville and Rabun soils are throughout the mapped area. Also included are areas of soils that have slopes of more than 25 percent and soils that do not have stones on the surface. Included soils make up about 20 percent of mapped areas.

Permeability is moderate, and available water capacity is high. Surface runoff is rapid. The hazard of erosion is severe. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 30 inches. The organic matter content is low to moderate, and the natural fertility is medium. This soil commonly is strongly acid or medium acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock generally is at a depth of more than 40 inches.

Most areas of this soil are in woodland.

This soil is not suited to hay and cultivated crops. The stones on the surface make use of modern equipment impractical.

This soil is moderately well suited to pasture crops. Establishing and maintaining a mixture of grasses and

legumes, use of proper stocking rates, rotation of pasture, deferred grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is very high, especially for loblolly pine, Virginia pine, yellow-poplar, and oaks. Seeds and seedlings survive and grow well if competing vegetation is controlled.

The slope, the low strength, the slowly permeable subsoil, and the clayey subsoil are the main limitations for nonfarm uses. Slope limits use of the soil as a building site and for shallow excavations. When wet, the clayey subsoil limits vehicular traffic. The slope and the clayey subsoil limit use of the soil for most sanitary facilities. Slope and large stones are limitations for recreational areas. The low strength and excess fines limit use of this soil as a source of roadfill.

This soil is in capability subclass VIs.

**32B—Fluvanna silt loam, 2 to 7 percent slopes.** This deep, gently sloping, well drained soil is on narrow to broad convex ridgetops. Areas of this soil are commonly irregularly rounded or oval. They range from 3 to about 20 acres.

Typically, the surface layer of this soil is brown silt loam about 8 inches thick. The subsoil is mostly yellowish red clay or silty clay loam about 40 inches thick. The substratum is multicolored silt loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of somewhat poorly drained to moderately well drained Orange soils and well drained Cullen, Nason, and Tatum soils. The Cullen soils are mainly on the higher landscape positions. The Orange, Nason, and Tatum soils are throughout the mapped area. Also included are small areas of soils that have a gravelly surface layer, severely eroded soils that have a surface layer of strong brown clay loam, and small areas of outcrops of rock. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability is moderately slow, and available water capacity is moderate. Surface runoff is medium. The hazard of erosion is moderate. This soil has good tilth. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content is low to moderate, and the natural fertility is medium. This soil commonly is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are in woodland. Some of the acreage is farmed.

This soil is well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system,

and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil.

The low strength of the soil, the moderate shrink-swell potential, and the moderately permeable, clayey subsoil are the main limitations for nonfarm uses. The low strength and the shrink-swell potential limit use of this soil as a building site, and the clayey subsoil limits excavations. When wet, the clayey subsoil limits vehicular traffic. The moderately permeable, clayey subsoil limits sanitary facilities. The low strength and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass IIe.

### **32C—Fluvanna silt loam, 7 to 15 percent slopes.**

This deep, strongly sloping, well drained soil is on narrow convex ridgetops and convex side slopes. Most side slopes are complex, and they commonly are long and winding. They range from 3 to about 20 acres.

Typically, the surface layer of this soil is brown silt loam about 8 inches thick. The subsoil is mostly yellowish red clay or silty clay loam about 40 inches thick. The substratum to a depth of 60 inches or more is multicolored silt loam.

Included with this soil in mapping are small areas of somewhat poorly drained to moderately well drained Orange soils and well drained Cullen, Nason, and Tatum soils. The Cullen soils are mainly on the higher landscape positions. The Orange, Nason, and Tatum soils are throughout the mapped area. Also included are small areas of soils that have a gravelly surface layer, severely eroded soils that have a strong brown clay loam surface layer, and small areas of outcrops of rock. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability is moderately slow, and the available water capacity is moderate. Surface runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content is low to moderate, and natural fertility is medium. This soil commonly is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are in woodland.

This soil is moderately well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high, especially for loblolly pine, Virginia pine, yellow-poplar, and oaks. Seeds and seedlings survive and grow well if competing vegetation is controlled.

The slope, the low strength, the moderate shrink-swell potential, and the slowly permeable, clayey subsoil are the main limitations for nonfarm uses. Slope, low strength, and the shrink-swell potential limit use of this soil as a building site, and the clayey subsoil limits excavations. When wet, the clayey subsoil limits use of the soil for most sanitary facilities and for recreational areas. The low strength and excess fines limit the use of this soil as a source of roadfill.

This soil is in capability subclass IIIe.

**33C—Fluvanna very stony silt loam, 7 to 15 percent slopes.** This deep, strongly sloping, well drained soil is on narrow convex ridgetops and on convex side slopes. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Most side slopes are complex and commonly are long and winding. Areas of this soil range from 3 to about 20 acres or more.

Typically, the surface layer of this soil is brown silt loam about 8 inches thick. The subsoil is mostly yellowish red clay or silty clay loam about 40 inches thick. The substratum to a depth of 60 inches or more is multicolored silt loam.

Included with this soil in mapping are small areas of well drained Cullen and Elioak soils and somewhat poorly drained to moderately well drained Orange soils. The Cullen and Elioak soils are mainly on the higher landscape positions. The Orange soils are throughout the mapped area. Also included are small areas of soils that have a gravelly surface layer and soils that do not have stones on the surface. Included soils make up about 20 percent of mapped areas.

Permeability is moderately slow, and available water capacity is moderate. Surface runoff is rapid. The hazard of erosion is severe. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content is low to moderate, and the natural fertility is medium. This soil commonly is

strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are in woodland.

This soil is not suited to hay and cultivated crops. The stones on the surface make the use of modern equipment impractical.

This soil is moderately well suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high, especially for loblolly pine, Virginia pine, yellow-poplar, and oaks. Seeds and seedlings survive and grow well if competing vegetation is controlled.

The slope, the low strength, the moderate shrink-swell potential, and the slowly permeable, clayey subsoil are the main limitations for nonfarm uses. Slope, low strength, and shrink-swell potential limit use of this soil as a building site, and the clayey subsoil limits excavations. When wet, the clayey subsoil limits vehicular traffic. The slope and the slowly permeable, clayey subsoil limit use of the soil for most sanitary facilities. Slope and large stones are limitations for recreational areas. The low strength and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass Vls.

**34B—Glenelg loam, 2 to 7 percent slopes.** This deep, gently sloping, well drained soil is on narrow to broad, convex ridgetops. Slopes are smooth and about 200 to 300 feet long. Areas of this soil commonly are irregularly rounded or long and winding. They range from 3 to about 20 acres.

Typically, the surface layer of this soil is dark brown and dark yellowish brown loam about 8 inches thick. The subsoil is mostly strong brown and yellowish red silty clay loam about 20 inches thick. The substratum is multicolored yellowish red, strong brown, and yellowish brown saprolite that crushes to loam to a depth of 80 inches.

Included with this soil in mapping are small areas of well drained Elioak and Manor soils throughout the mapped area. Also included are small areas of soils that have a gravelly surface layer and severely eroded soils that have a surface layer of yellowish red silty clay loam. Included soils make up about 10 percent of mapped areas.

Permeability is moderate, and the available water capacity is high. Surface runoff is medium. The hazard of erosion is moderate. The subsoil has low shrink-swell potential. The root zone extends to a depth of 30 inches. The organic matter content is low to moderate, and

natural fertility is low. This soil commonly is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 60 inches.

Most areas of this soil are in woodland. Some areas are farmed, and some areas are in pasture.

This soil is well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil.

The potential frost action, low strength, and seepage are the main limitations for nonfarm uses. Seepage limits use of this soil for septic tank absorption fields and for sewage lagoon areas. The potential frost action is a limitation for local roads and streets. Slope is a limitation for playgrounds. Low strength and excess fines limit use of this soil as a source of roadfill.

This soil is in capability subclass IIe.

**34C—Glenelg loam, 7 to 15 percent slopes.** This deep, strongly sloping, well drained soil is on narrow, convex ridgetops and on convex side slopes. Slopes are smooth and about 400 to 600 feet long. Areas of this soil commonly are long and winding. They range from 5 to about 40 acres.

Typically, the surface layer of this soil is dark brown and dark yellowish brown loam about 8 inches thick. The subsoil is mostly strong brown and yellowish red silty clay loam about 20 inches thick. The substratum to a depth of 80 inches is multicolored yellowish red, strong brown, and yellowish brown saprolite that crushes to loam.

Included with this soil in mapping are small areas of well drained Elioak and Manor soils. The Elioak and Manor soils are throughout the mapped area. Also included are small areas of gravelly soils and of severely eroded soils that have a yellowish red silty clay loam surface layer. Included soils make up about 15 percent of mapped areas.

Permeability is moderate, and available water capacity is high. Surface runoff is rapid. The hazard of erosion is severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of 30 inches or more. The

organic matter content is low to moderate, and the natural fertility is low. This soil commonly is strongly acid or very strongly acid, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 60 inches.

Most areas of this soil are in woodland. Some areas are farmed, and some areas are in pasture.

This soil is moderately well suited to cultivated crops. The severe hazard of erosion is a major management concern. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil. Seeds and seedlings survive and grow well if competing vegetation is controlled.

Slope, seepage, low strength, and potential frost action are the main limitations for nonfarm uses. Slope limits use of this soil as a building site and for recreational development. Slope and seepage limit most sanitary facilities. The potential frost action and slope limit use of the soil for local roads and streets. Low strength and excess fines limit use of this soil as a source of roadfill.

This soil is in capability subclass IIIe.

**34D—Glenelg loam, 15 to 25 percent slopes.** This deep, moderately steep, well drained soil is on side slopes along drainageways. Slopes are smooth and about 400 to 800 feet long. Areas of this soil commonly are long and winding. They range from 10 to about 40 acres.

Typically, the surface layer of this soil is dark brown and dark yellowish brown loam about 8 inches thick. The subsoil is mostly strong brown and yellowish red silty clay loam about 20 inches thick. The substratum is multicolored yellowish red, strong brown, and yellowish brown saprolite that crushes to loam to a depth of 80 inches.

Included with this soil in mapping are small areas of well drained Elioak and Manor soils, excessively drained Hazel soils, and well drained to moderately well drained Meadowville soils. The Elioak and Manor soils are throughout the mapped area. The Hazel soils are on the steeper positions and around outcrops of rock. The Meadowville soils are on foot slopes and along small

drainageways. Also included are small areas of soils that have a gravelly surface layer and of severely eroded soils that have a surface layer of yellowish red silty clay loam. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability is moderate, and available water capacity is high. Surface runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The subsoil has low shrink-swell potential. The root zone extends to a depth of 30 inches or more. The organic matter content is low to moderate, and the natural fertility is low. This soil commonly is strongly acid to very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 60 inches.

Most areas of this soil are in woodland. Some areas are in pasture.

This soil is poorly suited to cultivated crops. The severe hazard of erosion is a major management problem. The response of crops to lime and fertilizer is limited by the rapid runoff. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits safe operation of heavy equipment.

The slope is the main limitation for nonfarm uses. Slope limits use of this soil for most sanitary facilities. Slope is a limitation for building site development and recreational development. Slope and excess fines limit use of this soil as a source of roadfill.

This soil is in capability subclass IVe.

**34E—Glenelg loam, 25 to 45 percent slopes.** This deep, steep, well drained soil is on side slopes leading down to drainageways. Slopes are smooth and about 400 to 800 feet long. Areas of this soil commonly are long and winding. They range from 10 to about 40 acres.

Typically, the surface layer of this soil is dark brown and dark yellowish brown loam about 8 inches thick. The subsoil is about 20 inches thick. It is mostly strong brown and yellowish red silty clay loam. The substratum to a

depth of 80 inches is multicolored yellowish red, strong brown, and yellowish brown saprolite that crushes to loam.

Included with this soil in mapping are small areas of well drained Elioak and Manor soils, excessively drained Hazel soils, and well drained to moderately well drained Meadowville soils. The Elioak and Manor soils are throughout the mapped area. The Hazel soils are on the steeper positions and around outcrops of rock. The Meadowville soils are on foot slopes and along small drainageways. Also included are small areas of soils that have a gravelly surface layer and small areas of severely eroded soils that have a yellowish red silty clay loam surface layer. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability is moderate, and available water capacity is high. Surface runoff is very rapid. The hazard of erosion is very severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of 30 inches. The organic matter content is low to moderate, and the natural fertility is low. This soil commonly is strongly acid or very strongly acid, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 60 inches.

Most areas of this soil are in woodland. Some areas are in pasture.

This soil is not suited to cultivated crops. The steep slope makes use of modern tillage equipment impractical. The very severe hazard of erosion is a major management concern.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil. Seeds and seedlings survive and grow well if competing vegetation is controlled.

The slope is the main limitation for nonfarm uses. Slope limits use of this soil as a building site, for recreational development and for most sanitary facilities. Slope and excess fines limit use of this soil as a source of roadfill.

This soil is in capability subclass VIe.

**35C—Hartleton-Cataska very stony loams, 7 to 15 percent slopes.** This complex consists of sloping, well drained and excessively drained, deep and moderately deep soils. They are on convex ridges and side slopes of the Blue Ridge. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Slopes are smooth and about 200 to 400 feet long. Areas of this complex are along the mountain ranges and are long and winding. They range from 10 to 30 acres or more.

This complex is about 60 percent Hartleton soils, 30 percent Cataska soils, and 10 percent other soils. The areas of individual soils are so small or so intermingled that to separate them in mapping was not practical.

Typically, the surface layer of the Hartleton soil is yellowish brown channery loam about 7 inches thick. The subsoil is yellowish brown and brownish yellow channery and very channery loam about 25 inches thick. The substratum, about 12 inches thick, is brownish yellow extremely channery loam. Hard phyllite and shale bedrock is at a depth of 44 inches.

Typically, the surface layer of the Cataska soil is very dark grayish brown and brown channery loam about 5 inches thick. The subsoil is yellowish brown very channery silt loam about 15 inches thick. The substratum, about 18 inches thick, is 90 percent phyllite and shale fragments coated with yellowish brown loam. Hard phyllite and shale bedrock is at a depth of 38 inches.

Included with this complex in mapping are small areas, generally less than 3 acres in size, of soils that have an extremely stony surface layer and soils that do not have stones on the surface. Included soils make up less than 10 percent of mapped areas.

Permeability of these soils is moderate. Available water capacity is low for the Cataska soil and moderate for the Hartleton soil. Surface runoff is rapid. The hazard of erosion is severe. The natural fertility and the organic matter content are low in both soils. The subsoil has low shrink-swell potential. The root zone extends to a depth of less than 29 inches in the Cataska soil and to more than 30 inches in the Hartleton soil. The surface layer and subsoil are commonly very strongly acid or strongly acid, unless limed. The depth to bedrock is a limiting factor in the use of both of these soils.

Most areas of this complex are in woodland.

This complex is not suited to hay and cultivated crops. Large stones make use of modern equipment impractical. The soils are droughty during the growing season. The hazard of erosion is a major management concern.

This complex is poorly suited to pasture. Maintaining a mixture of grasses and legumes and overgrazing are major pasture management concerns. Proper stocking rates to maintain desirable grasses and legumes, adding lime and fertilizer according to soil tests, and controlled grazing are useful in pasture management.

Potential productivity for trees on this complex is moderately high for the Hartleton soils and low for the Cataska soils. The survival of seeds and seedlings is severely affected by droughtiness during the growing season. Logging roads and skid trails should be on the contour to reduce the concentration of runoff and help control erosion. The slope limits safe operation of heavy equipment.

Depth to bedrock and slope are the main limitations for most nonfarm uses of this complex.

This complex is in capability subclass VIIc.

**36B—Hayesville loam, 2 to 7 percent slopes.** This soil is deep, well drained, and gently sloping. It is on narrow to broad, convex ridgetops. Slopes are smooth and about 200 to 600 feet long. Areas of this soil are irregularly oval or are long and winding. They range from 5 to about 100 acres.

Typically, the surface layer of this soil is brown and strong brown loam about 7 inches thick. The subsoil is about 51 inches thick. It is mostly red clay and clay loam. The substratum to a depth of 83 inches or more is multicolored sandy clay loam derived from strongly weathered granite gneiss.

Included with this soil in mapping are intermingled areas of somewhat excessively drained Ashe soils and well drained Braddock, Chester, and Cullen soils. The Ashe soils are mostly on the steeper positions and around outcrops of rock. The Braddock, Chester, and Cullen soils are scattered throughout the mapped area. Also included are small areas of soils that have a gravelly or cobbly surface layer and small areas of severely eroded soil. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is medium. The erosion hazard is moderate. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content and the natural fertility are low to moderate. This soil commonly is strongly acid to very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is at a depth of more than 5 feet.

Many areas of this soil are in permanent pasture. Some areas are being farmed, and a few areas are in woodland.

This soil is well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help maintain organic matter content and control erosion. These practices also improve fertility and tilth, reduce crusting, and increase water infiltration and soil-seed contact.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface soil, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is high. Loblolly pine, shortleaf pine, Virginia pine, yellow-poplar, and oaks do well. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site

preparation, including cutting, spraying, girdling, and mowing.

The moderate permeability and clayey subsoil are the main limitations for most nonfarm uses. The clayey subsoil limits excavations and trench type sanitary landfills. The moderately permeable subsoil limits use of this soil for septic tank absorption fields. Slope is a limitation for playgrounds. This soil is good for use as openland and woodland wildlife habitats. Low strength and excess fines limit its use as a source of roadfill.

This soil is in capability subclass IIc.

**36C—Hayesville loam, 7 to 15 percent slopes.** This soil is deep, well drained, and strongly sloping. It is on narrow convex ridgetops and side slopes. Slopes are smooth and about 200 to 600 feet long. Areas of this soil are long and winding. They range from 5 to about 50 acres.

Typically, the surface layer of this soil is brown and strong brown loam about 7 inches thick. The subsoil is about 51 inches thick. It is mostly red clay and clay loam. The substratum to a depth of 83 inches or more is multicolored sandy clay loam derived from strongly weathered granite gneiss.

Included with this soil in mapping are intermingled areas of somewhat excessively drained Ashe soils and well drained Braddock, Chester, and Cullen soils. The Ashe soils are mostly on the steeper positions and around outcrops of rock. The Braddock, Chester, and Cullen soils are scattered throughout the mapped area. Also included are small areas of soils that have a gravelly or cobbly surface layer and small areas of severely eroded soil. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content and the natural fertility are low to moderate. This soil commonly is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is at a depth of more than 5 feet.

Many areas of this soil are in permanent pasture. Some areas are being farmed, and a few areas are in woodland.

This soil is moderately well suited to cultivated crops. The severe hazard of erosion is a major management concern. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help maintain organic matter content and control erosion. These practices also improve fertility and tilth, reduce crusting, and increase water infiltration and soil-seed contact.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface soil, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is high. Loblolly pine, shortleaf pine, Virginia pine, yellow-poplar, and oaks do well. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, girdling, and mowing.

The slope, moderate permeability, and clayey subsoil are the main limitations for most nonfarm uses. Slope limits use of this soil for community development, and the clayey subsoil limits excavations and trench type sanitary landfills. The moderately permeable subsoil limits septic tank absorption fields. Slope limits the use of this soil for playgrounds. This soil is good for use as openland and woodland wildlife habitats. Low strength and excess fines limit its use as a source of roadfill.

This soil is in capability subclass IIIe.

#### **36D—Hayesville loam, 15 to 25 percent slopes.**

This soil is deep, well drained, and moderately steep. It is on side slopes that border small drainageways. Slopes are smooth and about 200 to 400 feet long. Areas of this soil are long and winding. They range from 5 to about 20 acres.

Typically, the surface layer of this soil is brown and strong brown loam about 7 inches thick. The subsoil is about 51 inches thick. It is mostly red clay and clay loam. The substratum to a depth of 83 inches or more is multicolored sandy clay loam derived from strongly weathered granite gneiss.

Included with this soil in mapping are intermingled areas of somewhat excessively drained Ashe soils and well drained Braddock, Chester, and Cullen soils. The Ashe soils are mostly on the steeper positions and around outcrops of rock. The Braddock, Chester, and Cullen soils are scattered throughout the mapped area. Also included are small areas of soils that have a gravelly or cobbly surface layer and small areas of severely eroded soil. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content and the natural fertility are low to moderate. This soil commonly is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is at a depth of more than 5 feet.

Many areas of this soil are in permanent pasture. Some areas are in woodland, and a few areas are farmed.

This soil is poorly suited to cultivated crops. The severe hazard of erosion is a major management concern. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help maintain organic matter content and control erosion. These practices also improve fertility and tilth, reduce crusting, and increase water infiltration and soil-seed contact.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of adapted grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface soil, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is high. Loblolly pine, shortleaf pine, Virginia pine, yellow-poplar, and oaks do well. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, girdling, and mowing.

Slope, moderate permeability, and clayey subsoil are the main limitations for most nonfarm uses. Slope limits use of this soil for building sites, for most sanitary facilities, and for playgrounds. The clayey subsoil limits trench type sanitary landfills. This soil is fair for use as openland wildlife habitat and good for use as woodland wildlife habitat. Low strength and excess fines limit its use as a source of roadfill.

This soil is in capability subclass IVe.

**36E—Hayesville loam, 25 to 45 percent slopes.** This soil is deep, well drained, and steep. It is on side slopes that border small drainageways. Slopes are smooth and about 200 to 600 feet long. Areas of this soil are long and winding. They range from 5 to about 30 acres.

Typically, the surface layer of this soil is brown and strong brown loam about 7 inches thick. The subsoil is about 51 inches thick. It is mostly red clay and clay loam. The substratum to a depth of 83 inches or more is multicolored sandy clay loam derived from strongly weathered granite gneiss.

Included with this soil in mapping are intermingled areas of somewhat excessively drained Ashe soils and well drained Chester and Cullen soils. The Ashe soils are mostly on the steeper positions and around outcrops of rock. The Chester and Cullen soils are scattered throughout the mapped area. Also included are small areas of soils that have a gravelly or cobbly surface layer and small areas of severely eroded soil. The included

soils and outcrops make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is very rapid. The hazard of erosion is very severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content and the natural fertility are low to moderate. This soil commonly is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is at a depth of more than 5 feet.

Many areas of this soil are in permanent pasture. Some areas are in woodland.

This soil is not suited to cultivated crops. The severe hazard of erosion is a major management concern.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of adapted grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface soil, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is high. Loblolly pine, shortleaf pine, Virginia pine, yellow-poplar, and oaks do well. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, girdling, and mowing.

Slope, moderate permeability, and clayey subsoil are the main limitations for most nonfarm uses. Slope limits use of this soil for building sites, for most sanitary facilities, and for playgrounds. The clayey subsoil limits trench type sanitary landfills. This soil is fair for use as openland and woodland wildlife habitats. Slope, low strength, and excess fines limit its use as a source of roadfill.

This soil is in capability subclass VIe.

**37B3—Hayesville clay loam, 2 to 7 percent slopes, severely eroded.** This soil is deep, well drained, and gently sloping. It is on narrow convex ridgetops. Slopes are smooth and about 200 to 400 feet long. Areas of this soil are irregularly oval or are long and winding. They range from 3 to about 20 acres.

Typically, the surface layer of this soil is yellowish red clay loam about 4 inches thick. The subsoil is about 47 inches thick. It is mostly red clay and clay loam. The substratum to a depth of 79 inches or more is multicolored sandy clay loam derived from strongly weathered granite gneiss.

Included with this soil in mapping are intermingled areas of well drained Braddock, Chester, and Cullen soils. These soils are scattered throughout the mapped area. Also included are small areas of soils that have a gravelly or cobbly surface layer and areas of soils in

which bedrock is at a depth of less than 60 inches. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is medium. The hazard of erosion is moderate. Tilth is fair, and the surface layer breaks into large clods if tilled when too wet or dry. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content and the natural fertility are low. The soil commonly is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is at a depth of more than 5 feet.

Many areas of this soil are in permanent pasture. Some areas are being farmed, and a few areas are in woodland.

This soil is moderately well suited to cultivated crops. The moderate hazard of erosion and the damage of past erosion are major management concerns. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help maintain organic matter content and control erosion. These practices also improve fertility and tilth, reduce crusting, and increase water infiltration and soil-seed contact.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizers according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface soil, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is high. Loblolly pine, shortleaf pine, Virginia pine, yellow-poplar, and oaks do well. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, girdling, and mowing.

Moderate permeability and clayey subsoil are the main limitations for most nonfarm uses. The clayey subsoil limits excavations and trench type sanitary landfills. The moderately permeable subsoil limits use of this soil for septic tank absorption fields, and slope limits the use of the soil for playgrounds. This soil is good for use as openland and woodland wildlife habitats. Low strength and excess fines limit its use as a source of roadfill.

This soil is in capability subclass IIIe.

**37C3—Hayesville clay loam, 7 to 15 percent slopes, severely eroded.** This soil is deep, well drained, and strongly sloping. It is on narrow convex ridgetops and side slopes. Slopes are smooth and about 200 to

400 feet long. Areas of this soil are long and winding. They range from 3 to about 20 acres.

Typically, the surface layer of this soil is yellowish red clay loam about 4 inches thick. The subsoil is about 47 inches thick. It is mostly red clay and clay loam. The substratum to a depth of 79 inches or more is multicolored sandy clay loam derived from strongly weathered granite gneiss.

Included with this soil in mapping are intermingled areas of somewhat excessively drained Ashe soils and well drained Braddock, Chester, and Cullen soils. The Ashe soils are mostly on the steeper positions and around outcrops of rock. The Braddock, Chester, and Cullen soils are scattered throughout the mapped area. Also included are small areas of soils that have a gravelly or cobbly surface layer. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. Tilth is fair, and the surface layer breaks into large clods if tilled when too wet or dry. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content and the natural fertility are low. This soil commonly is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is at a depth of more than 5 feet.

Many areas of this soil are in permanent pasture. Some areas are farmed, and a few areas are in woodland.

This soil is poorly suited to cultivated crops. The severe hazard of erosion and the damage of past erosion are major management concerns. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help maintain organic matter content and control erosion. These practices also improve fertility and tilth, reduce crusting, and increase water infiltration and soil-seed contact.

The soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of adapted grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface soil, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is high. Loblolly pine, shortleaf pine, Virginia pine, yellow-poplar, and oaks do well. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, girdling, and mowing.

Slope, moderate permeability, and clayey subsoil are the main limitations for most nonfarm uses of this soil.

Slope limits community development, and clayey subsoil limits excavations and trench type sanitary landfills. The moderately permeable subsoil limits use of this soil for septic tank absorption fields. Slope limits its use for playgrounds. This soil is good for use as openland and woodland wildlife habitats. The low strength and excess fines limit its use as a source of roadfill.

This soil is in capability subclass IVe.

**37D3—Hayesville clay loam, 15 to 25 percent slopes, severely eroded.** This soil is deep, well drained, and moderately steep. It is on side slopes that border small drainageways. Slopes are smooth and about 200 to 400 feet long. Areas of this soil are long and winding. They range from 3 to about 20 acres.

Typically, the surface layer of this soil is yellowish red clay loam about 4 inches thick. The subsoil is about 47 inches thick. It is mostly red clay and clay loam. The substratum to a depth of 79 inches or more is multicolored sandy clay loam derived from strongly weathered granite gneiss.

Included with this soil in mapping are intermingled areas of somewhat excessively drained Ashe soils and well drained Chester and Cullen soils. The Ashe soils are mostly on the steeper positions and around outcrops of rock. The Chester and Cullen soils are scattered throughout the mapped area. Also included are small areas of soils that have a gravelly or cobbly surface layer. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content and the natural fertility are low. This soil commonly is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is at a depth of more than 5 feet.

Many areas of this soil are in permanent pasture. Some areas are in woodland, and a few areas are being farmed.

This soil is not suited to cultivated crops. The severe hazard of erosion and the damage of past erosion are major management concerns.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface soil, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is high. Loblolly pine, shortleaf pine, Virginia pine, yellow-poplar, and oaks do well. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions

for survival and growth can be improved by good site preparation, including cutting, spraying, girdling, and mowing.

The slope, moderate permeability, and clayey subsoil are the main limitations for most nonfarm uses. Slope limits use of this soil for building sites, for most sanitary facilities, and for playgrounds. The clayey subsoil limits trench type sanitary landfills. This soil is fair for use as openland wildlife habitat and good for use as woodland wildlife habitat. Slope, low strength, and excess fines limit its use as a source of roadfill.

This soil is in capability subclass VIe.

**37E3—Hayesville clay loam, 25 to 45 percent slopes, severely eroded.** This soil is deep, well drained, and steep. It is on side slopes that border small drainageways. Slopes are smooth and about 200 to 400 feet long. Areas of this soil are long and winding. They range from 3 to about 10 acres.

Typically, the surface layer of this soil is yellowish red clay loam about 4 inches thick. The subsoil is about 47 inches thick. It is mostly red clay and clay loam. The substratum to a depth of 79 inches or more is multicolored sandy clay loam derived from strongly weathered granite gneiss.

Included with this soil in mapping are intermingled areas of somewhat excessively drained Ashe soils and well drained Chester and Cullen soils. The Ashe soils are mostly on the steeper positions and around outcrops of rock. The Chester and Cullen soils are scattered throughout the mapped area. Also included are small areas of soils that have a gravelly or cobbly surface layer. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is very rapid. The hazard of erosion is very severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content and natural fertility are low. This soil commonly is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is at a depth of more than 5 feet.

Many areas of this soil are in woodland. Some areas are in permanent pasture.

This soil is not suited to hay and cultivated crops. The severe hazard of erosion and the damage of past erosion are major management concerns.

This soil is poorly suited to pasture crops. Establishing and maintaining a mixture of adapted grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface soil, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is high. Loblolly pine, shortleaf pine, Virginia pine, yellow-poplar, and oaks do well. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, girdling, and mowing.

Slope, moderate permeability, and clayey subsoil are the main limitations for most nonfarm uses. Slope limits use of this soil for building sites, for most sanitary facilities, and for playgrounds. The clayey subsoil limits trench type sanitary landfills. This soil is fair for use as openland and woodland wildlife habitats. Slope, low strength, and excess fines limit its use as a source of roadfill.

This soil is in capability subclass VIIe.

**38C—Hayesville very stony loam, 7 to 15 percent slopes.** This soil is deep, well drained, and strongly sloping. It is on narrow convex ridgetops and side slopes. Stones 3 to 10 feet apart cover 3 to 15 percent of the surface. Slopes are smooth and are about 200 to 600 feet long. Areas of this soil are long and winding. They range from 3 to about 40 acres.

Typically, the surface layer of this soil is strong brown loam about 7 inches thick. The subsoil is about 51 inches thick. It is mostly red clay and clay loam. The substratum to a depth of 83 inches or more is multicolored sandy clay loam derived from strongly weathered granite gneiss.

Included with this soil in mapping are intermingled areas of somewhat excessively drained Ashe soils and well drained Braddock, Chester, and Cullen soils. The Ashe soils are mostly on the steeper positions and around outcrops of rock. The Braddock, Chester, and Cullen soils are scattered throughout the mapped area. Also included are small areas of soils that do not have stones on the surface. The included soils and outcrops make up about 25 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content and the natural fertility are low to moderate. This soil commonly is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is at a depth of more than 5 feet.

Many areas of this soil are in woodland. A few areas are in permanent pasture.

This soil is not suited to hay and cultivated crops. Sufficient stones are present to make use of modern equipment impractical.

This soil is moderately well suited to pasture crops. Establishing and maintaining a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer

according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface soil, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is high. Loblolly pine, shortleaf pine, Virginia pine, yellow-poplar, and oaks do well. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, girdling, and mowing.

Slope, moderate permeability, and clayey subsoil are the main limitations for most nonfarm uses. Slope limits use of this soil for community development and playgrounds. The clayey subsoil limits excavations and trench type sanitary landfills. The moderately permeable subsoil limits use of this soil for septic tank absorption fields. This soil is good for use as openland and woodland wildlife habitats. Low strength and excess fines limit its use as a source of roadfill.

This soil is in capability subclass VIs.

**38D—Hayesville very stony loam, 15 to 25 percent slopes.** This soil is deep, well drained, and moderately steep. It is on side slopes in mountainous areas. Slopes are smooth and about 300 to 1,000 feet long. Stones 3 to 10 feet apart cover 3 to 15 percent of the surface. Areas of this soil are irregular in shape. They range from 5 to about 50 acres.

Typically, the surface layer of this soil is strong brown loam about 7 inches thick. The subsoil is about 51 inches thick. It is mostly red clay and clay loam. The substratum to a depth of 83 inches or more is multicolored sandy clay loam derived from strongly weathered granite gneiss.

Included with this soil in mapping are intermingled areas of somewhat excessively drained Ashe soils and well drained Braddock, Chester, and Cullen soils. The Ashe soils are mostly on the steeper positions and around outcrops of rock. The Braddock, Chester, and Cullen soils are scattered throughout the mapped area. Also included are small areas of soils that do not have stones on the surface. The included soils and outcrops make up about 25 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content and natural fertility are low to moderate. This soil commonly is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is at a depth of more than 5 feet.

Many areas of this soil are in woodland. A few areas are in permanent pasture.

This soil is not suited to hay and cultivated crops. Sufficient stones are present to make use of modern equipment impractical.

This soil is moderately well suited to pasture. Establishing and maintaining a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface soil, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is high. Loblolly pine, shortleaf pine, Virginia pine, yellow-poplar, and oaks do well. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, girdling, and mowing.

Slope, moderate permeability, and clayey subsoil are the main limitations for most nonfarm uses. Slope limits use of this soil for building sites and for playgrounds. The clayey subsoil limits excavations and trench type sanitary landfills. The moderately permeable subsoil limits use of this soil for septic tank absorption fields. This soil is fair for use as openland wildlife habitat and good for use as woodland wildlife habitat. Slope, low strength, and excess fines limit its use as a source of roadfill.

This soil is in capability subclass VIs.

**38E—Hayesville very stony loam, 25 to 45 percent slopes.** This soil is deep, well drained, and steep. It is on narrow convex ridgetops and side slopes. Slopes are smooth and about 200 to 600 feet long. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Areas of this soil are long and winding. They range from 10 to about 50 acres.

Typically, the surface layer of this soil is strong brown loam about 7 inches thick. The subsoil is about 51 inches thick. It is mostly red clay and clay loam. The substratum to a depth of 83 inches or more is multicolored sandy clay loam derived from strongly weathered granite gneiss.

Included with this soil in mapping are intermingled areas of somewhat excessively drained Ashe soils and well drained Chester and Cullen soils. The Ashe soils are mostly on the steep positions and around outcrops of rock. The Chester and Cullen soils are scattered throughout the mapped area. Also included are small areas of soils that do not have stones on the surface. The included soils and outcrops make up about 25 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is very rapid. The hazard of erosion is very severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content and the natural fertility are

low to moderate. This soil commonly is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is at a depth of more than 5 feet.

Many areas of this soil are in woodland. A few areas are in permanent pasture.

This soil is not suited to hay and cultivated crops. Steep slopes and stones make use of modern equipment impractical.

This soil is poorly suited to pasture crops. Establishing and maintaining a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface soil, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is high. Loblolly pine, shortleaf pine, Virginia pine, yellow-poplar, and oaks do well. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, girdling, and mowing.

Slope, moderate permeability, and clayey subsoil are the main limitations for most nonfarm uses. Slope limits use of this soil for building sites, for most sanitary facilities, and for playgrounds. The clayey subsoil limits trench type sanitary landfills. This soil is fair for use as openland and woodland wildlife habitats. Slope, low strength, and excess fines limit its use as a source of roadfill.

This soil is in capability subclass VII<sub>s</sub>.

**39C—Hazel loam, 7 to 15 percent slopes.** This moderately deep, strongly sloping, excessively drained soil is on ridgetops and side slopes. Areas of this soil are long and winding. They range from about 10 to 50 acres.

Typically, the surface layer is dark brown and brown loam, about 10 inches thick. The subsoil is mostly brown loam about 10 inches thick. The substratum, to a depth of 30 inches, is strong brown channery loam. Bedrock is at a depth of 30 inches.

Included with this soil in mapping are small areas of well drained Albemarle, Culpeper, Glenelg, and Elioak soils. The Albemarle and Glenelg soils are throughout the mapped area. The Culpeper and Elioak soils are on the less sloping positions. Also included are areas of soils that have slopes of less than 7 percent and small areas that have a very stony surface layer. Included soils make up about 20 percent of mapped areas.

Permeability of this soil is moderately rapid. Available water capacity is low. Surface runoff is rapid. The hazard of erosion is severe. The surface layer is friable, and tilth is good. The subsoil has low shrink-swell potential. The root zone extends to a depth of 20 inches. The organic matter content and the natural fertility are low. This soil

commonly is strongly acid or very strongly acid. Depth to bedrock ranges from 20 to 40 inches.

Most areas of this soil are in woodland, and a few areas are in pasture.

This soil is poorly suited to cultivated crops. The severe hazard of erosion is a major management concern. If the soil is cultivated, conservation tillage, stubble mulching, use of cover crops, use of grasses and legumes in the cropping system, use of lime and fertilizer according to soil tests, and contour strip cropping help reduce runoff and control erosion.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderate. This soil is managed for mixed hardwoods and pines. Seeds and seedlings do well if competing vegetation is controlled. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion.

The slope and depth to bedrock are the main limitations for nonfarm uses. Slope and depth to rock limit use of this soil as a building site and as a site for sanitary facilities. Slope is a limitation for recreational areas. The soil is fair as a source of roadfill.

This soil is in capability subclass IV<sub>e</sub>.

**39D—Hazel loam, 15 to 25 percent slopes.** This moderately deep, moderately steep, excessively drained soil is on narrow ridgetops and side slopes. Areas of this soil are wide and winding. They range from about 20 to 75 acres.

Typically, the surface layer is dark brown and brown loam about 10 inches thick. The subsoil is mostly brown loam about 10 inches thick. The substratum to a depth of 30 inches is strong brown channery loam. Bedrock is at a depth of 30 inches.

Included with this soil in mapping are small areas of well drained Albemarle, Culpeper, Glenelg, and Elioak soils. The Albemarle and Glenelg soils are throughout the mapped area. The Culpeper and Elioak soils are on the less sloping positions. Also included are small areas of soils that have a very stony surface layer. Included soils make up about 20 percent of mapped areas.

Permeability of this soil is moderately rapid. Available water capacity is low. Surface runoff is rapid. The hazard of erosion is severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of 20 inches. The organic matter content and natural fertility are low. This soil commonly is strongly acid or very strongly acid. The depth to bedrock ranges from 20 to 40 inches.

Most areas of this soil are in woodland, and a few areas are in pasture.

This soil is not suited to cultivated crops. The low available water capacity restricts plant growth.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees is moderate. This soil is managed for mixed hardwoods and pines. Seeds and seedlings do fairly well if competing vegetation is controlled. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits the safe operation of heavy equipment.

The slope and depth to rock are the main limitations for nonfarm uses. They limit the use of this soil as a building site or a site for sanitary facilities. Slope is a limitation for recreational areas. This soil is fair as a source for roadfill.

This soil is in capability subclass VIe.

**39E—Hazel loam, 25 to 45 percent slopes.** This moderately deep, steep, excessively drained soil is on side slopes. Areas of this soil are wide and winding. They range from about 30 to 100 acres.

Typically, the surface layer is dark brown and brown loam, about 10 inches thick. The subsoil is mostly brown loam about 10 inches thick. The substratum to a depth of 30 inches is strong brown channery loam. Bedrock is at a depth of 30 inches.

Included with this soil in mapping are small areas of well drained Culpeper and Elioak soils, well drained to excessively drained Louisburg soils, and somewhat excessively drained Manor soils. The Culpeper and Elioak soils are on the less sloping positions, are commonly severely eroded, and have a clay loam surface layer. The Louisburg and Manor soils are throughout the mapped area. Also included are small areas of soils that have a very stony surface layer. Included soils make up 20 percent of mapped areas.

Permeability of this soil is moderately rapid. Available water capacity is low. Surface runoff is very rapid. The hazard of erosion is very severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of 20 inches. The organic matter content and natural fertility are low. This soil commonly is strongly acid or very strongly acid. Depth to bedrock ranges from 20 to 40 inches.

Most areas of this soil are in woodland, and a few areas are in pasture.

This soil is not suited to hay and cultivated crops. The steep slopes make use of modern equipment impractical.

This soil is poorly suited to pasture. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use

of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderate. This soil is managed for mixed hardwoods and pines. Seeds and seedlings do fairly well if competing vegetation is controlled. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits the safe operation of heavy equipment.

The slope and depth to rock are the main limitations for nonfarm uses. These limit the use of this soil as a building site or a site for sanitary facilities. Slope is a limitation for recreational areas. This soil is poor as a source of roadfill because of the steep slope.

This soil is in capability subclass VIIe.

**40D—Hazel very stony loam, 15 to 25 percent slopes.** This moderately deep, moderately steep, excessively drained soil is on narrow ridgetops and side slopes. Stones, 3 to 10 feet apart, cover about 3 to 15 percent of the surface. Areas of this soil are wide and winding. They range from about 30 to 100 acres.

Typically, the surface layer is dark brown and brown loam about 10 inches thick. The subsoil is mostly brown loam about 10 inches thick. The substratum to a depth of 30 inches is strong brown channery loam. Bedrock is at a depth of 30 inches.

Included with this soil in mapping are small areas of well drained Albemarle and Culpeper soils, well drained to excessively drained Louisburg soils, and somewhat excessively drained Manor soils. The Albemarle and Culpeper soils are on the less sloping positions, commonly are severely eroded, and have a clay loam surface. The Louisburg and Manor soils are throughout the mapped area. Also included are small areas of soils that do not have stones on the surface and small areas that have slopes of less than 15 percent. Included soils make up about 20 percent of mapped areas.

Permeability is moderately rapid. Available water capacity is low. Surface runoff is rapid. The hazard of erosion is severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of 30 inches. The organic matter content and natural fertility are low. This soil commonly is strongly acid or very strongly acid. The depth to bedrock ranges from 20 to 40 inches.

Most areas of this soil are in woodland, and a few areas are in pasture.

This soil is not suited to cultivated crops and hay. Stones on the surface make use of modern equipment impractical.

This soil is moderately well suited to pasture. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture.

Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderate. This soil is managed for mixed hardwoods and pines. Seeds and seedlings do fairly well if competing vegetation is controlled. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits the safe operation of heavy equipment.

Slope, depth to rock, and large stones are the main limitations for nonfarm uses. These limit this soil as a building site or a site for sanitary facilities. Slope and large stones are limitations for recreational development. Large stones limit use of this soil as a source of topsoil. This soil is a fair source of roadfill.

This soil is in capability subclass VI<sub>s</sub>.

**40E—Hazel very stony loam, 25 to 45 percent slopes.** This moderately deep, steep, excessively drained soil is on side slopes. Stones, 3 to 10 feet apart, cover about 3 to 15 percent of the surface. Areas of this soil are wide and winding. They range from about 30 to 100 acres.

Typically, the surface layer is dark brown and brown loam about 10 inches thick. The subsoil is mostly brown loam about 10 inches thick. The substratum to a depth of 30 inches is strong brown channery loam. Bedrock is at a depth of 30 inches.

Included with this soil in mapping are small areas of well drained Albemarle and Culpeper soils, well drained to excessively drained Louisburg soils, and somewhat excessively drained Manor soils. The Albemarle and Culpeper soils are on the less sloping positions, commonly are severely eroded, and have a clay loam surface layer. The Louisburg and Manor soils are throughout the mapped area. Also included are small areas of soils that do not have stones on the surface. Included soils make up about 20 percent of mapped areas.

Permeability is moderate. Available water capacity is low. Surface runoff is very rapid. The hazard of erosion is very severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of 30 inches. The organic matter content and the natural fertility are low. This soil commonly is strongly acid or very strongly acid. Depth to bedrock ranges from 20 to 40 inches.

Most areas of this soil are in woodland, and a few areas are in pasture.

This soil is not suited to cultivated crops and hay. Stones on the surface and slope make use of modern equipment impractical.

This soil is poorly suited to pasture. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes

compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderate. This soil is managed for mixed hardwoods and pines. Seeds and seedlings do fairly well if competing vegetation is controlled. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits the safe operation of heavy equipment.

Slope, depth to rock, and large stones are the main limitations for nonfarm uses. These limit use of this soil as a building site or a site for sanitary facilities. Slope and large stones are limitations for recreational development. Large stones limit use of this soil as a source of topsoil. This soil is a poor source of roadfill because of slope.

This soil is in capability subclass VII<sub>s</sub>.

**41B—Hiwassee loam, 2 to 7 percent slopes.** This deep, gently sloping, well drained soil is on high terraces along larger streams. Slopes are smooth and about 200 to 600 feet long. Areas of this soil are irregular in shape. They range from 5 to about 15 acres.

Typically, the surface layer of this soil is dark reddish brown loam about 8 inches thick. The upper 39 inches of the subsoil is dark red clay. The lower part of the subsoil to a depth of 64 inches or more is dark red silty clay loam and has brownish yellow mottles (fig. 8).

Included with this soil in mapping are small areas of well drained Masada, Totier, and Turbeville soils. These soils are throughout the mapped area. Also included are small areas of soils that have slopes of less than 2 percent and of severely eroded soils that have a clay loam surface layer. Included soils make up about 15 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is medium. The hazard of erosion is moderate. This soil has good tilth. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content is low, and the natural fertility is medium. This soil commonly is slightly acid to very strongly acid throughout, unless limed. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are in cultivated cropland.

This soil is well suited to cultivated crops, pasture, and hay. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture.



Figure 8.—A road cut in Hiwassee loam, 2 to 7 percent slopes. Soil retained near the top of the cut and sediment retained near the bottom are the result of plant cover.

Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high. The soil is managed for pines and hardwood. Seeds and seedlings survive and grow well if competing vegetation is controlled.

The low strength and the moderately permeable, clayey subsoil are the main limitations for nonfarm uses. Low strength and the clayey subsoil limit use of this soil as a building site. The clayey, moderately permeable subsoil limits some sanitary facilities. Slope is a limitation for playgrounds.

This soil is in capability subclass IIe.

**41C—Hiwassee loam, 7 to 15 percent slopes.** This deep, strongly sloping, well drained soil is on side slopes of high terraces along larger streams. Slopes are smooth

and about 300 to 600 feet long. Areas of this soil are irregular in shape. They range from 3 to about 20 acres.

Typically, the surface layer of this soil is dark reddish brown loam about 8 inches thick. The upper 39 inches of the subsoil is dark red clay. The lower part of the subsoil to a depth of 60 inches or more is dark red silty clay loam and has brownish yellow mottles.

Included with this soil in mapping are small areas of well drained Rapidan, Totier, and Turbeville soils. These soils are throughout the mapped area. Also included are small areas of soils that have a gravelly or cobbly surface layer and of severely eroded soils that have a clay loam surface layer. Included soils make up about 15 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The subsoil has low

shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content is low, and the natural fertility is medium. This soil commonly is slightly acid to very strongly acid throughout, unless limed. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are farmed. They are in cultivated crops. A few areas are in woodland.

This soil is moderately well suited to cultivated crops. The severe hazard of erosion is a major management concern. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high. The soil is managed for pines and hardwoods. Seeds and seedlings survive and grow well if competing vegetation is controlled. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion.

Low strength, moderately permeable, clayey subsoil, and slope are the main limitations for nonfarm uses. Low strength, slope, and a clayey subsoil limit use of this soil as a building site. The moderately permeable, clayey subsoil and slope are limitations for most sanitary facilities. Slope is a limitation for recreational development.

This soil is in capability subclass IIIe.

**42B3—Hiwassee clay loam, 2 to 7 percent slopes, severely eroded.** This deep, gently sloping, well drained soil is on high terraces along larger streams. Slopes are smooth and about 300 to 600 feet long. Areas of this soil are irregular in shape. They range from 3 to about 20 acres.

Typically, the surface layer of this soil is dark reddish brown clay loam about 4 inches thick. The upper 35 inches of the subsoil is dark red clay. The lower part of the subsoil to a depth of 60 inches or more is dark red silty clay loam and has brownish yellow mottles.

Included with this soil in mapping are small areas of well drained Rapidan, Totier, and Turbeville soils. These soils are throughout the mapped area. Also included are small areas of soils that have a gravelly or cobbly surface layer. Included soils make up about 15 percent of mapped areas.

Permeability and the available water capacity are moderate. Surface runoff is medium. The hazard of erosion is moderate. The surface layer is firm, and tilth is fair. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content is low, and natural fertility is medium. This soil commonly is slightly acid to very strongly acid throughout, unless limed. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are in cultivated cropland.

This soil is moderately well suited to cultivated crops. The moderate hazard of erosion and the damage of past erosion are major management concerns. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderate. The soil is managed for pines and hardwoods. Seeds and seedlings survive and grow well if competing vegetation is controlled.

Low strength and moderately permeable, clayey subsoil are the main limitations for nonfarm uses. Low strength and the clayey subsoil limit use of this soil as a building site. The clayey, moderately permeable subsoil is a limitation for some sanitary facilities. Slope is a limitation for playgrounds.

This soil is in capability subclass IIIe.

**42C3—Hiwassee clay loam, 7 to 15 percent slopes, severely eroded.** This deep, strongly sloping, well drained soil is on side slopes of high terraces along larger streams. Slopes are smooth and about 300 to 600 feet long. Areas of this soil are irregular in shape. They range from 3 to about 20 acres.

Typically, the surface layer of this soil is dark reddish brown clay loam about 4 inches thick. The upper 35 inches of the subsoil is dark red clay. The lower part of the subsoil to a depth of 60 inches or more is dark red silty clay loam and has brownish yellow mottles.

Included with this soil in mapping are small areas of well drained Rapidan, Totier, and Turbeville soils. These soils are throughout the mapped area. Also included are small areas of soils that have a gravelly or cobbly surface layer. Included soils make up about 15 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion

is severe. The surface layer is firm, and tilth is fair. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content is low, and the natural fertility is medium. This soil commonly is slightly acid to very strongly acid throughout, unless limed. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are farmed. They are in cultivated crops. A few acres are in woodland.

This soil is poorly suited to cultivated crops. The severe hazard of erosion and the damage of past erosion are major management concerns. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderate. The soil is managed for pines and hardwoods. Seeds and seedlings survive and grow well if competing vegetation is controlled. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion.

Low strength, moderately permeable, clayey subsoil, and slope are the main limitations for nonfarm uses. Low strength, slope, and a clayey subsoil limit use of this soil as a building site. The moderately permeable, clayey subsoil and slope are limitations for most sanitary facilities.

This soil is in capability subclass IVe.

**42D3—Hiwassee clay loam, 15 to 25 percent slopes, severely eroded.** This deep, moderately steep, well drained soil is on side slopes of high terraces along larger streams. Slopes are smooth and about 200 to 500 feet long. Areas of this soil are long and narrow. They range from 5 to about 15 acres.

Typically, the surface layer of this soil is dark reddish brown clay loam about 4 inches thick. The upper 35 inches of the subsoil is dark red clay. The lower part of the subsoil to a depth of 60 inches or more is dark red silty clay loam and has brownish yellow mottles.

Included with this soil in mapping are small areas of well drained Masada, Rapidan, Totier, and Turbeville soils. These soils are throughout the mapped area. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion

is severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content is low, and the natural fertility is medium. This soil commonly is slightly acid to very strongly acid throughout, unless limed. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are in pasture. A few areas are in woodland.

This soil is not suited to cultivated crops. Because of past erosion the surface layer is firm and tilth is poor.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderate. The soil is managed for pines and hardwoods. Seeds and seedlings survive and grow well if competing vegetation is controlled. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion.

The slope is the main limitation for nonfarm uses. Slope limits use of this soil as a building site, for most sanitary facilities, and for recreational development.

This soil is in capability subclass VIe.

**43B—Kilnesville channery silt loam, 2 to 7 percent slopes.** This shallow, gently sloping, well drained soil is on narrow, convex ridgetops and points of ridges. Slopes are smooth and 100 to 300 feet long. Areas of this soil commonly are irregularly rounded or elongated. They range from 3 to about 15 acres.

Typically, the surface layer of this soil is reddish brown channery silt loam about 4 inches thick. The subsoil is dark red very channery silt loam about 6 inches thick. The substratum to a depth of 14 inches is reddish brown very channery silt loam. Rippable shale bedrock is at a depth of 14 inches.

Included with this soil in mapping are small areas of moderately well drained to well drained Manassas soils and well drained Penn soils. The Manassas soils are in depressions and along small drainageways. The Penn soils are throughout the mapped area. Included soils make up about 15 percent of mapped areas.

Permeability is moderately rapid, and available water capacity is very low. Surface runoff is medium. The hazard of erosion is moderate. Tilth is good. The subsoil has low shrink-swell potential. The root zone is restricted to a depth of less than 20 inches by bedrock. The organic matter content and the natural fertility are low. This soil commonly is medium acid to very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of less than 20 inches.

Most areas of this soil are in pasture or woodland.

This soil is moderately well suited to cultivated crops. It is droughty during the growing season, and crop response to lime and fertilizer is limited by the lack of moisture. Alfalfa is short lived because of the shallow rooting depth. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tillth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderate. Seeds and seedlings are affected by droughtiness during the growing season. Loblolly pine and Virginia pine do well on this soil.

Depth to bedrock and seepage are the main limitations for nonfarm uses. The depth to bedrock limits use of this soil as a building site and for recreational development. Seepage and depth to bedrock limit most sanitary facilities. The depth to bedrock limits use of the soil as a source of roadfill. The soil is poor for use as openland wildlife habitat and very poor for use as woodland wildlife habitat.

This soil is in capability subclass IIIe.

**43C—Kilnesville channery silt loam, 7 to 15 percent slopes.** This shallow, strongly sloping, well drained soil is on convex side slopes and the points of ridges. Slopes are smooth and 200 to 600 feet long. Areas of this soil commonly are irregular in shape or are long and winding. They range from 3 to about 25 acres.

Typically, the surface layer of this soil is reddish brown channery silt loam about 4 inches thick. The subsoil is dark red very channery silt loam about 6 inches thick. The substratum to a depth of 14 inches is reddish brown very channery silt loam. Rippable shale bedrock is at a depth of 14 inches.

Included with this soil in mapping are small areas of moderately well drained to well drained Manassas soils and well drained Penn soils. The Manassas soils are in depressions and along small drainageways. The Penn soils are throughout the mapped area. Included soils make up about 15 percent of mapped areas.

Permeability is moderately rapid, and available water capacity is very low. Surface runoff is rapid. The hazard of erosion is severe. Tillth is good. The subsoil has low shrink-swell potential. The root zone is restricted to a depth of less than 20 inches by bedrock. The organic matter content and the natural fertility are low. This soil commonly is medium acid to very strongly acid throughout, but reaction in the surface layer is variable

because of local liming. Bedrock is generally at a depth of less than 20 inches.

Most areas of this soil are in pasture or woodland.

This soil is poorly suited to cultivated crops. It is droughty during the growing season, and crop response to lime and fertilizer is limited by the lack of moisture. Alfalfa is short lived because of the shallow rooting depth. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tillth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderate. Seeds and seedlings are affected by droughtiness during the growing season. Loblolly pine and Virginia pine do well on this soil.

Slope, depth to bedrock, and seepage are the main limitations for nonfarm uses. The depth to bedrock limits use of this soil as a building site and for recreational development. The slope, seepage, and the depth to bedrock limit most sanitary facilities. The depth to bedrock limits use of the soil as a source of roadfill. The soil is poor for use as openland wildlife habitat and very poor for use as woodland wildlife habitat.

This soil is in capability subclass IVe.

**43D—Kilnesville channery silt loam, 15 to 25 percent slopes.** This shallow, moderately steep, well drained soil is on convex side slopes. Slopes are smooth and 200 to 400 feet long. Areas of this soil commonly are long and winding. They range from 3 to about 25 acres.

Typically, the surface layer of this soil is reddish brown channery silt loam about 4 inches thick. The subsoil is dark red very channery silt loam about 6 inches thick. The substratum to a depth of 14 inches is reddish brown very channery silt loam. Rippable shale bedrock is at a depth of 14 inches.

Included with this soil in mapping are small areas of well drained Penn soils. The Penn soils are throughout the mapped area. Included soils make up about 10 percent of mapped areas.

Permeability is moderately rapid, and available water capacity is very low. Surface runoff is rapid. The hazard of erosion is severe. The subsoil has low shrink-swell potential. The root zone is restricted to a depth of less than 20 inches by bedrock. The organic matter content and the natural fertility are low. This soil commonly is medium acid to very strongly acid throughout, but reaction in the surface layer is variable because of local

liming. Bedrock is generally at a depth of less than 20 inches.

Most areas of this soil are in pasture and woodland.

This soil is not suited to cultivated crops. The hazard of erosion is a major management concern. The soil is droughty during the growing season, and plant response to lime and fertilizer is limited by the lack of moisture. Alfalfa is short lived because of the shallow rooting depth.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderate. Seeds and seedlings are affected by droughtiness during the growing season. Loblolly pine and Virginia pine do well on this soil.

Slope, depth to bedrock, and seepage are the main limitations for nonfarm uses. The slope and depth to rock limit use of the soil as a building site and for recreational development. Slope, seepage, and the depth to bedrock limit most sanitary facilities. The depth to bedrock limits use of the soil as a source of roadfill. The soil is poor for use as openland wildlife habitat and very poor for use as woodland wildlife habitat.

This soil is in capability subclass VIe.

**43E—Kilnesville channery silt loam, 25 to 45 percent slopes.** This shallow, steep, well drained soil is on side slopes along drainageways and bluffs along streams. Slopes are smooth and 200 to 400 feet long. Areas of this soil commonly are long and winding. They range from 3 to about 20 acres.

Typically, the surface layer of this soil is reddish brown channery silt loam about 4 inches thick. The subsoil is dark red very channery silt loam about 6 inches thick. The substratum to a depth of 14 inches is reddish brown very channery silt loam. Rippable shale bedrock is at a depth of 14 inches.

Included with this soil in mapping are small areas of well drained Penn soils. The Penn soils are throughout the mapped area. Also included are small areas of outcrops of rock and small areas of gullied soils. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability is moderately rapid, and available water capacity is very low. Surface runoff is very rapid. The hazard of erosion is very severe. The subsoil has low shrink-swell potential. The root zone is restricted to a depth of less than 20 inches by bedrock. The organic matter content and the natural fertility are low. This soil commonly is medium acid to very strongly acid throughout, but reaction in the surface layer is variable

because of local liming. Bedrock is generally at a depth of less than 20 inches.

Most areas of this soil are in woodland.

This soil is not suited to cultivated crops. The soil is droughty during the growing season, and plant response to lime and fertilizer is limited by the lack of moisture. Alfalfa is short lived because of the shallow rooting depth.

This soil is poorly suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderate. Seeds and seedlings are affected by droughtiness during the growing season. Loblolly pine and Virginia pine do well on this soil.

Slope, depth to bedrock, and seepage are the main limitations for nonfarm uses. Slope and depth to bedrock limit use of this soil as a building site and for recreational development. Slope, seepage, and depth to bedrock are limitations for most sanitary facilities. Depth to bedrock and slope limit use of the soil as a source for roadfill. This soil is poor for use as openland wildlife habitat and very poor for use as woodland wildlife habitat.

This soil is in capability subclass VIIe.

**44C—Lew very stony silt loam, 7 to 15 percent slopes.** This deep, strongly sloping, well drained soil is on concave side slopes along drainageways and small depressions. Slopes are smooth and 100 to 600 feet long. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Areas of this soil commonly are long and winding and range from 5 to more than 30 acres.

Typically, the surface layer of this soil is dark brown and brown channery silt loam about 7 inches thick. The subsoil is about 53 inches thick. It is yellowish red channery and very channery silty clay loam above a depth of 30 inches and strong brown very channery silty clay loam below a depth of 30 inches.

Included with this soil in mapping are areas of Unison soils, generally less than 3 acres. The Unison soils are throughout the mapped area. Also included are small areas of soils that have an extremely stony surface layer. Included soils make up about 15 percent of mapped areas.

Permeability is moderate, and available water capacity is low. Surface runoff is rapid. The hazard of erosion is severe. The surface layer is friable, but tillage is impractical because of stones. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content is low to moderate, and the natural fertility is medium. This soil commonly is very strongly acid or strongly acid.



Figure 9.—Lew very stony silt loam, 7 to 15 percent slopes, in foreground and Myersville very stony silt loam, 15 to 25 percent slopes, on side slopes in background.

throughout, unless limed. Depth to bedrock is generally more than 60 inches.

Most areas of this soil are in woodland. A few areas are in pasture.

This soil is not suited to hay and cultivated crops. Large stones on the surface make use of modern equipment impractical (fig. 9).

This soil is moderately well suited to pasture. When lime and fertilizer are applied according to soil tests, pasture crops respond well. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, and controlled grazing help increase the carrying capacity of pasture and help control erosion. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion.

Large stones are the main limitation for nonfarm uses. They limit the use of this soil for sanitary facilities, for building site development, as a source of roadfill, and for most recreational uses.

This soil is in capability subclass VI.

**44D—Lew very stony silt loam, 15 to 25 percent slopes.** This deep, moderately steep, well drained soil is on concave side slopes along drainageways. Slopes are smooth and 100 to 600 feet long. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Areas of this soil commonly are long and winding and range from 5 to more than 30 acres.

Typically, the surface layer of this soil is dark brown and brown channery silt loam about 7 inches thick. The subsoil is about 53 inches thick. It is yellowish red channery and very channery silty clay loam above a depth of 30 inches and strong brown very channery silty clay loam below a depth of 30 inches.

Included with this soil in mapping are areas of Unison soils, generally less than 3 acres. The Unison soils are throughout the mapped area. Also included are small areas of soils that have an extremely stony surface layer. Included soils make up about 15 percent of mapped areas.

Permeability is moderate, and available water capacity is low. Surface runoff is rapid. The hazard of erosion is severe. The surface layer is friable, but tillage is impractical because of stones. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content is low to moderate, and the natural fertility is medium. This soil commonly is very strongly acid or strongly acid throughout, unless limed. Depth to bedrock is generally more than 60 inches.

Most areas of this soil are in woodland. A few areas are in pasture.

This soil is not suited to hay and cultivated crops. Large stones on the surface make use of modern equipment impractical.

This soil is moderately well suited to pasture. When lime and fertilizer are applied according to soil tests, pasture crops respond well. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, and controlled grazing help increase the carrying capacity of pasture and help control erosion. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion.

Large stones and slope are the main limitations for nonfarm uses. They limit the use of this soil for sanitary facilities, for building site development, as a source of roadfill, and for most recreational uses.

This soil is in capability subclass VI.

**45C—Low extremely stony silt loam, 7 to 15 percent slopes.** This deep, strongly sloping, well drained soil is on concave side slopes along drainageways. Slopes are smooth and 100 to 600 feet long. Stones, 1/2 foot to 3 feet apart, cover 15 to 50 percent of the surface. Areas of this soil commonly are long and winding and range from 5 to more than 30 acres.

Typically, the surface layer of this soil is dark brown and brown channery silt loam about 7 inches thick. The subsoil is about 53 inches thick. It is yellowish red channery and very channery silty clay loam above a depth of 30 inches and strong brown very channery silty clay loam below a depth of 30 inches.

Included with this soil in mapping are areas of Unison soils, generally less than 3 acres. The Unison soils are throughout the mapped area. Also included are small

areas of soils that have a very stony surface layer. Included soils make up about 15 percent of mapped areas.

Permeability is moderate, and available water capacity is low. Surface runoff is rapid. The hazard of erosion is severe. The surface layer is friable, but tillage is impractical because of stones. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content is low to moderate, and the natural fertility is medium. This soil commonly is very strongly acid or strongly acid throughout, unless limed. Depth to bedrock is generally more than 60 inches.

Most areas of this soil are in woodland.

This soil is not suited to hay and cultivated crops. Large stones on the surface make use of modern tillage equipment impractical.

This soil is poorly suited to pasture. When lime and fertilizer are applied according to soil tests, pasture crops respond well. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, and controlled grazing help increase the carrying capacity of pasture and help control erosion. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion.

Large stones are the main limitation for nonfarm uses. Large stones limit use of this soil for sanitary facilities, for building site development, as a source of roadfill, and for most recreational uses.

This soil is in capability subclass VII.

**45D—Low extremely stony silt loam, 15 to 25 percent slopes.** This deep, moderately steep, well drained soil is on concave side slopes along drainageways in the Blue Ridge. Slopes are smooth and 100 to 600 feet long. Stones, 1/2 foot to 3 feet apart, cover 15 to 50 percent of the surface. Areas of this soil commonly are long and winding and range from 5 to more than 30 acres.

Typically, the surface layer of this soil is dark brown and brown channery silt loam about 7 inches thick. The subsoil is about 53 inches thick. It is yellowish red channery and very channery silty clay loam above a depth of 30 inches and strong brown very channery silty clay loam below this depth.

Included with this soil in mapping are areas of Unison soils, generally less than 3 acres. The Unison soils are throughout the mapped area. Also included are small areas of soils that have a very stony surface layer. Included soils make up about 10 percent of mapped areas.

Permeability is moderate, and available water capacity is low. Surface runoff is rapid. The hazard of erosion is severe. The surface layer is friable, but tillage is impractical because of stones. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content is low to moderate, and the natural fertility is medium. This soil commonly is very strongly acid or strongly acid throughout, unless limed. Depth to bedrock is generally more than 60 inches.

Most areas of this soil are in woodland.

This soil is not suited to hay and cultivated crops. Large stones on the surface make use of modern equipment impractical.

This soil is poorly suited to pasture. When lime and fertilizer are applied according to soil tests, pasture crops respond well. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, and controlled grazing help increase the carrying capacity of pasture and help to control erosion. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion.

Slope and large stones are the main limitations for nonfarm uses. They limit the use of this soil for sanitary facilities, for building site development, as a source of roadfill, and for most recreational uses.

This soil is in capability subclass VIIc.

**46B—Lignum silt loam, 2 to 7 percent slopes.** This deep, gently sloping, moderately well drained to somewhat poorly drained soil is in depressions, on foot slopes, and along small drainageways. Slopes are smooth and commonly concave. Areas of this soil are elongated, irregularly oval, or rectangular. They range from 3 to about 20 acres.

Typically, the surface layer of this soil is very pale brown silt loam about 9 inches thick. The subsoil is 29 inches thick. To a depth of 25 inches, the subsoil is brownish yellow silty clay loam and has light gray mottles. To a depth of 38 inches, it is mostly brownish yellow silty clay and has light gray mottles. The substratum is yellow, brown, gray, and black strongly weathered schist that crushes easily to silt loam. Hard schist bedrock is at a depth of 58 inches.

Included with this soil in mapping are small areas of moderately well drained Abell soils, well drained Nason soils, and poorly drained Worsham soils. The Abell soils are along small drainageways and on foot slopes. The Nason soils are on the higher positions. The Worsham soils are on toe slopes and along small drainageways. Included soils make up about 15 percent of mapped areas.

Permeability is moderately slow to slow, and available water capacity is moderate. Surface runoff is medium. The hazard of erosion is moderate. This soil has good tilth. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of at least 25 inches. The organic matter content and the natural fertility are low. The surface layer and subsoil commonly are strongly acid to very strongly acid, but reaction in the surface layer is variable because of local liming. The seasonal high water table is at a depth of 1 foot to 2 1/2 feet during winter and early in spring. Bedrock is generally at a depth of more than 40 inches.

Most areas of this soil are in woodland. Some areas are farmed, and some areas are in pasture.

This soil is moderately well suited to cultivated crops. Deep-rooted crops are commonly stunted or short lived because of wetness. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is wet causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, Virginia pine, sweetgum, and oaks do moderately well on this soil. The soil is soft when wet, limiting the use of heavy equipment. Windthrow causes some losses when the soil is wet because of the limited rooting depth above the perched water table.

The shallow depth to the seasonal high water table, the slowly permeable, clayey subsoil, the depth to rock, and the low strength are the main limitations for nonfarm uses. The seasonal high water table causes dampness in basements and crawlspaces in winter and spring and limits use of this soil as a site for most sanitary facilities. Many of the areas dry out slowly in spring and after heavy rains. The slowly permeable subsoil limits use of the soil for septic tank absorption fields, and the soil needs a suitable base material to provide strength to support vehicular traffic.

This soil is in capability subclass IIIw.

**47C—Louisburg sandy loam, 7 to 15 percent slopes.** This deep, strongly sloping, well drained to excessively drained soil is on convex ridgetops, on points of ridges, and on side slopes. Areas of this soil are irregularly oblong. They range from 5 to about 30 acres.

Typically, the surface layer of this soil is brown sandy loam about 5 inches thick. The subsoil is yellowish brown sandy loam about 18 inches thick. The substratum is mostly brown and yellow partially weathered bedrock that crushes to sandy loam to a depth of about 60 inches.

Included with this soil in mapping are small areas of well drained Albemarle, Pacolet, and Wedowee soils and excessively drained Hazel soils. The Albemarle, Pacolet, and Wedowee soils are mostly on ridges and the less steep positions. The Hazel soils are scattered throughout the mapped area. Also included are small areas of soils that have a very stony surface layer. Included soils make up about 25 percent of mapped areas.

Permeability is rapid, and available water capacity is low. Surface runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The surface layer is friable and easily tilled through a wide range of soil moisture. The subsoil has very low shrink-swell potential. The root zone extends to a depth of about 40 inches. The organic matter content and the natural fertility are low. This soil is strongly acid or very strongly acid throughout, but reaction is variable because of local liming. Bedrock is generally at a depth of more than 48 inches.

Most areas of this soil are in woodland.

This soil is poorly suited to cultivated crops. It is droughty during the growing season, and response to lime and fertilizer is limited by the low available water capacity. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high, especially for loblolly pine and Virginia pine. The survival of seeds and seedlings is affected by drought during the growing season. Thinning stands, clear cutting, replanting with fast-growing trees, and removal of insect- or disease-infested trees help increase timber production.

Slope, seepage, and depth to bedrock are the main limitations for nonfarm uses. Depth to bedrock and slope limit use of this soil as a building site and as a site for septic tank absorption fields. Seepage limits the use of this soil for sanitary landfills. Depth to bedrock and slope limit excavations. The low available water capacity limits the growth of grasses and shrubs. This soil is a good source of roadfill.

This soil is in capability subclass IVe.

**47D—Loulsburg sandy loam, 15 to 25 percent slopes.** This deep, moderately steep, well drained to excessively drained soil is on convex ridgetops, on points of ridges, and on side slopes. Areas of this soil are slightly elongated or long and winding. They range from 10 to about 40 acres.

Typically, the surface layer of this soil is brown sandy loam about 5 inches thick. The subsoil is yellowish brown sandy loam about 18 inches thick. The substratum is mostly brown and yellow partially weathered bedrock that crushes to sandy loam to a depth of about 60 inches.

Included with this soil in mapping are small areas of well drained Albemarle, Pacolet, and Wedowee soils and excessively drained Hazel soils. The Albemarle, Pacolet, and Wedowee soils are mostly on ridges. The Hazel soils are scattered throughout the mapped area. Also included are small areas of soils that have a very stony surface layer. Included soils make up about 25 percent of mapped areas.

Permeability is rapid, and the available water capacity is low. Surface runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The surface layer is friable and easily tilled through a wide range of soil moisture. The subsoil has very low shrink-swell potential. The root zone extends to a depth of about 40 inches. The organic matter content and natural fertility are low. This soil is strongly acid or very strongly acid throughout, but reaction is variable because of local liming. Bedrock is generally at a depth of more than 48 inches.

Most areas of this soil are in woodland.

This soil is not suited to cultivated crops. It is droughty during the growing season, and response to lime and fertilizer is limited by the low available water capacity.

This soil is poorly suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high, especially for loblolly pine and Virginia pine. The survival of seeds and seedlings is affected by drought during the growing season. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits safe operation of equipment.

The slope and seepage are the main limitations for nonfarm uses. Slope limits use of this soil as a building site and as a site for septic tank absorption fields. Seepage limits use of the soil for sanitary landfills. Slope limits excavations. The low available water capacity limits the growth of grasses and shrubs. This soil is a fair source of roadfill.

This soil is in capability subclass VIe.

**47E—Louisburg sandy loam, 25 to 45 percent slopes.** This deep, steep, well drained to excessively drained soil is on points of ridges and on side slopes. Areas of this soil are slightly elongated or long and winding. They range from 10 to about 50 acres.

Typically, the surface layer of this soil is brown sandy loam about 5 inches thick. The subsoil is yellowish brown sandy loam about 18 inches thick. The substratum is mostly brown and yellow partially weathered bedrock that crushes to sandy loam to a depth of about 60 inches.

Included with this soil in mapping are small areas of well drained Albemarle and Wedowee soils and excessively drained Hazel soils. The Albemarle and Wedowee soils are mostly on ridges. The Hazel soils are scattered throughout the mapped area. Also included are small areas of soils that have a very stony surface layer. Included soils make up about 25 percent of mapped areas.

Permeability is rapid, and available water capacity is low. Surface runoff is very rapid. The hazard of erosion is very severe. The subsoil has very low shrink-swell potential. The root zone extends to a depth of about 40 inches. The organic matter content and the natural fertility are low. This soil is strongly acid or very strongly acid throughout. Bedrock is generally at a depth of more than 48 inches.

Most areas of this soil are in woodland.

This soil is not suited to hay and cultivated crops. The slopes are too steep for safe use of modern equipment. The soil is droughty during the growing season.

This soil is poorly suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high, especially for loblolly pine and Virginia pine. The survival of seeds and seedlings is affected by drought during the growing season. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. Slope limits safe operation of equipment.

Slope and seepage are the main limitations for nonfarm uses. Slope limits use of the soil as a building site and as a site for septic tank absorption fields. Seepage limits use of the soil as a site for sanitary landfills. Slope and depth to bedrock limit excavations. The low available water capacity limits the growth of grasses and shrubs. The soil is a poor source of roadfill because of slope.

This soil is in capability subclass VIIe.

**48D—Louisburg very stony sandy loam, 15 to 25 percent slopes.** This deep, moderately steep, well

drained to excessively drained soil is on convex ridgetops, on points of ridges, and on side slopes. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Areas of this soil are slightly elongated or long and winding. They range from 10 to about 40 acres.

Typically, the surface layer of this soil is brown sandy loam about 5 inches thick. The subsoil is yellowish brown sandy loam about 18 inches thick. The substratum is mostly brown and yellow partially weathered bedrock that crushes to sandy loam to a depth of about 60 inches.

Included with this soil in mapping are small areas of well drained Albemarle and excessively drained Hazel soils. The Albemarle soils are mostly on ridges. The Hazel soils are scattered throughout the mapped area. Also included are small areas of soils that do not have stones on the surface and small areas that have slopes of less than 15 percent. Included soils make up about 25 percent of mapped areas.

Permeability is rapid, and available water capacity is low. Surface runoff is rapid. The hazard of erosion is severe. The subsoil has very low shrink-swell potential. The root zone extends to a depth of about 40 inches. The organic matter content and the natural fertility are low. This soil is strongly acid or very strongly acid throughout, but reaction is variable because of local liming. Bedrock is generally at a depth of more than 48 inches.

Most areas of this soil are in woodland.

This soil is not suited to hay and cultivated crops. Large stones on the surface make the use of modern equipment impractical. The soil is droughty during the growing season, and response to lime and fertilizer is limited by the low available water capacity.

This soil is poorly suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high, especially for loblolly pine and Virginia pine. The survival of seeds and seedlings is affected by droughtiness during the growing season. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits safe operation of equipment.

Slope, large stones, and seepage are the main limitations for nonfarm uses. Slope limits use of this soil as sites for buildings and septic tank absorption fields. Large stones and seepage limit use of the soil as a site for sanitary landfills. Slope limits excavations. The low available water capacity limits the growth of grasses and shrubs. This soil is a fair source of roadfill.

This soil is in capability subclass VIIs.

**48E—Louisburg very stony sandy loam, 25 to 45 percent slopes.** This deep, steep, well drained to excessively drained soil is on points of ridges and on side slopes of Piedmont uplands. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Areas of this soil are slightly elongated or long and winding. They range from 10 to about 50 acres.

Typically, the surface layer of this soil is brown sandy loam about 5 inches thick. The subsoil is yellowish brown sandy loam about 18 inches thick. The substratum is mostly brown and yellow, partially weathered bedrock that crushes to sandy loam to a depth of about 60 inches.

Included with this soil in mapping are small areas of well drained Albemarle soils and excessively drained Hazel soils. The Albemarle soils are mostly on ridges. The Hazel soils are scattered throughout the mapped area. Also included are small areas of soils that do not have stones on the surface. Included soils make up about 25 percent of mapped areas.

Permeability is rapid, and available water capacity is low. Surface runoff is very rapid. The hazard of erosion is very severe. The subsoil has very low shrink-swell potential. The root zone extends to a depth of about 40 inches. The organic matter content and the natural fertility are low. This soil is strongly acid or very strongly acid throughout. Bedrock is generally at a depth of more than 48 inches.

Most areas of this soil are in woodland.

This soil is not suited to hay or cultivated crops. Large stones and steep slopes make use of modern equipment impractical. The soil is droughty during the growing season.

This soil is poorly suited to pasture. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high, especially for loblolly pine and Virginia pine. The survival of seeds and seedlings is affected by drought during the growing season. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff to help control erosion. Slope limits safe operation of heavy equipment.

Slope, large stones, and seepage are the main limitations for nonfarm uses. Slope limits use of this soil as a site for buildings and septic tank absorption fields. Large stones and seepage limit use of the soil as a site for sanitary landfills. Slope limits excavations. The low available water capacity limits the growth of grasses and shrubs. This soil is a poor source of roadfill because of slope.

This soil is in capability subclass VII.

**49B—Manassas silt loam, 2 to 7 percent slopes.** This deep, gently sloping, well drained to moderately well drained soil is on foot slopes, in depressions, and along small drainageways. Slopes are smooth, slightly concave, and about 100 to 400 feet long. Most areas of this soil are long and winding. They range from 3 to about 15 acres.

Typically, the surface layer of this soil is reddish brown silt loam about 18 inches thick. The subsoil, about 22 inches thick, to a lithological discontinuity, is mostly yellowish red and red clay loam and brown silty clay loam. The subsoil to a depth of 64 inches is mostly yellowish red shaly silty clay.

Included with this soil in mapping are small areas of well drained Bermudian and Starr soils and moderately well drained to somewhat poorly drained Creedmoor and Rowland soils. The Bermudian and Rowland soils are along streams on flood plains. The Creedmoor and Starr soils are throughout the mapped area. Also included are small areas of soils that have a gravelly surface layer. Included soils make up about 20 percent of mapped areas.

Permeability is moderate to moderately rapid, and available water capacity is high. Surface runoff is medium. The hazard of erosion is moderate. This soil has good tilth. The surface layer is friable and easily tilled through a wide range of soil moisture. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content is moderate, and the natural fertility is medium. This soil commonly is strongly acid to medium acid throughout, but reaction in the surface layer is variable because of local liming. Flooding is occasional. A seasonal high water table is at a depth of 2 to 3 feet during winter and spring. Bedrock is generally at a depth of more than 4 feet.

Most areas of this soil are farmed. Some areas are in pasture, and a few areas are in woodland.

This soil is well suited to cultivated crops. Moderate hazard of erosion, occasional flooding, and runoff from higher lying areas are major management concerns. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing and grazing when the soil is wet causes compaction of the surface soil and damages stands of grasses and legumes.

Potential productivity for trees on this soil is high, especially for loblolly pine, yellow-poplar, sweetgum, and oaks. Seeds and seedlings survive and grow well.

The seasonal high water table, occasional flooding, low strength, and moderate to moderately rapid permeability of the subsoil are the main limitations for nonfarm uses. The low strength and seasonal high water table limit use of this soil for local roads and streets and as a building site. The moderate to moderately rapid permeability of the subsoil, occasional flooding, and the seasonal water table are limitations for most sanitary facilities. Slope is a limitation for playgrounds. The low strength and excess fines limit use of this soil as a source of roadfill.

This soil is in capability subclass IIe.

**50D—Manor loam, 15 to 25 percent slopes.** This deep, moderately steep, well drained to somewhat excessively drained soil is on side slopes. Slopes are smooth and about 100 to 400 feet long. Areas of this soil are short and winding. They range from about 5 to 15 acres.

Typically, the surface layer is dark grayish brown and brown loam about 8 inches thick. The subsoil is mostly yellowish red loam about 10 inches thick. The substratum to a depth of 40 inches is strong brown loam and to a depth of 60 inches or more is multicolored yellowish brown, yellow, and strong brown loam.

Included with this soil in mapping are small areas of well drained Elioak and Glenelg soils and excessively drained Hazel soils. The Elioak soils are on the less steep positions. The Glenelg and Hazel soils are throughout the mapped area. Included soils make up about 15 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. The surface layer of this soil is friable, and tilth is good. The subsoil has low shrink-swell potential. The root zone extends to a depth of at least 40 inches. The organic matter content is low to moderate, and the natural fertility is low. This soil commonly is strongly acid to very strongly acid throughout, unless limed. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are in woodland, and a few areas are in pasture.

This soil is poorly suited to cultivated crops. The severe hazard of erosion is a major management concern. When lime and fertilizer are applied according to soil tests, crops respond well. Minimum tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is moderately well suited to pasture and poorly suited to hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper

stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. This soil is managed for pines and hardwoods. Seeds and seedlings do well if competing vegetation is controlled. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits safe operation of heavy equipment.

The slope is the main limitation for nonfarm uses. Slope limits use of this soil as sites for buildings, sanitary facilities, and recreational development. The soil is a fair source of roadfill.

This soil is in capability subclass IVe.

**50E—Manor loam, 25 to 45 percent slopes.** This deep, steep, well drained to somewhat excessively drained soil is on side slopes. Slopes are smooth and about 100 to 400 feet long. Areas of this soil are short and winding. They range from about 5 to 15 acres.

Typically, the surface layer is dark grayish brown and brown loam about 8 inches thick. The subsoil is mostly yellowish red loam about 10 inches thick. The substratum, to a depth of 40 inches, is strong brown loam and, to a depth of 60 inches or more, is multicolored yellowish brown, yellow, and strong brown loam.

Included with this soil in mapping are small areas of well drained Elioak and Glenelg soils and excessively drained Hazel soils. The Elioak soils are on the less steep positions. The Glenelg and Hazel soils are throughout the mapped area. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is very rapid. The hazard of erosion is very severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of at least 40 inches. The organic matter content is low to moderate, and the natural fertility is low. This soil commonly is strongly acid or very strongly acid throughout, unless limed. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are in woodland. A few areas are in pasture.

This soil is not suited to cultivated crops and hay. The steep slope makes use of modern tillage equipment impractical.

This soil is moderately well suited to pasture. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. This soil is managed for pines and hardwoods. Seeds and seedlings do well if competing vegetation is controlled. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits safe operation of heavy equipment.

The slope is the main limitation for nonfarm uses. Slope limits use of this soil as sites for buildings, sanitary facilities, and recreational development. This soil is a poor source for roadfill because of the slope.

This soil is in capability subclass VIe.

**51B—Manteo channery silt loam, 2 to 7 percent slopes.** This shallow, gently sloping, somewhat excessively drained soil is on weakly convex ridgetops. Slopes are smooth and about 200 to 500 feet long. Areas of this soil are along ridges and are long and winding. They range from 5 to about 15 acres or more.

Typically, the surface layer of this soil is very dark grayish brown and brown channery silt loam about 6 inches thick. The subsoil is yellowish brown, friable, very channery silt loam about 8 inches thick. The substratum is about 4 inches thick. It is brownish yellow extremely channery loam and has about 75 percent schist fragments. Bedrock is at a depth of 18 inches (fig. 10).

Included with this soil in mapping are small intermingled areas, generally less than 3 acres, of moderately well drained to somewhat poorly drained Lignum soils and well drained Nason and Tatum soils. The Lignum soils are in depressions and along small streams. The Nason and Tatum soils are scattered throughout the mapped area. Included soils make up about 20 percent of mapped areas.

Permeability is moderately rapid, and available water capacity is very low. Surface runoff is medium. The soil has good tilth. The hazard of erosion is moderate. The natural fertility and the content of organic matter are low. The subsoil has low shrink-swell potential. The root zone extends to a depth of less than 20 inches. The surface layer and subsoil commonly are very strongly acid to extremely acid.

Most areas of this soil are in woodland. A very few areas are farmed or in pasture.

This soil is poorly suited to cultivated crops. The soil is droughty during the growing season. The hazard of erosion is moderate and is a major management concern. Other management concerns are the need to increase organic matter content and use of lime and fertilizer according to soil tests to offset the acidity and low natural fertility of this soil. If this soil is cultivated, conservation tillage and use of cover crops and grasses and legumes in the cropping system help reduce runoff and control erosion.

This soil is moderately well suited to pasture and hay crops. Maintaining a mixture of grasses and legumes, adding lime and fertilizer according to soil tests, and

overgrazing are major pasture management concerns. Proper stocking rates to maintain desirable grasses and legumes, rotation of pasture, and deferment of grazing are useful in pasture management.

Potential productivity for trees on this soil is moderate. The soil is managed mostly for loblolly and shortleaf pine. The survival of seeds and seedlings is severely affected by droughtiness during the growing season. Windthrow is a hazard because of the shallow rooting depth.

Depth to bedrock and the moderately rapid permeability are the main limitations for nonfarm uses.

This soil is in capability subclass IVe.

**51C—Manteo channery silt loam, 7 to 15 percent slopes.** This shallow, strongly sloping, somewhat excessively drained soil is on side slopes. Slopes are smooth and about 200 to 500 feet long. Areas of this soil are along the ridges and are long and winding. They range from 15 to about 50 acres.

Typically, the surface layer of this soil is very dark grayish brown and brown channery silt loam about 6 inches thick. The subsoil is yellowish brown, friable very channery silt loam about 8 inches thick. The substratum is about 4 inches thick. It is brownish yellow extremely channery loam and about 75 percent schist fragments. Bedrock is at a depth of 18 inches.

Included with this soil in mapping are small intermingled areas, generally less than 3 acres, of moderately well drained to somewhat poorly drained Lignum soils and well drained Nason and Tatum soils. The Lignum soils are in depressions and along small streams. The Nason and Tatum soils are scattered throughout the mapped area. Also included are small areas of soils that have a very channery surface layer. Included soils make up 20 percent of mapped areas.

Permeability is moderately rapid, and available water capacity is very low. Surface runoff is rapid. The hazard of erosion is severe. The organic matter content and the natural fertility are low. The subsoil has low shrink-swell potential. The root zone extends to a depth of less than 20 inches. The surface layer and subsoil commonly are very strongly acid or extremely acid.

Most areas of this soil are in woodland. A very few areas are farmed or in pasture.

This soil is not suited to cultivated crops. It is droughty during the growing season. The hazard of erosion is severe and is a major management concern.

This soil is moderately well suited to pasture and hay crops. Maintaining a mixture of grasses and legumes, adding lime and fertilizer according to soil tests, and overgrazing are major pasture management concerns. Proper stocking rates to maintain desirable grasses and legumes and controlled grazing are useful in pasture management.

Potential productivity for trees on this soil is moderate. The soil is managed mostly for loblolly and shortleaf



Figure 10.—Cutbank in an area of Manteo channery silt loam, 2 to 7 percent slopes. The exposed underlying bedrock and roots hold the soil in place and cause a slight overhang.

pine. The survival of seeds and seedlings is severely affected by droughtiness during the growing season. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion.

Depth to bedrock, seepage, and slope are the main limitations for nonfarm uses.

This soil is in capability subclass VIe.

**51D—Manteo channery silt loam, 15 to 25 percent slopes.** This moderately steep, shallow, somewhat excessively drained soil is on side slopes. Slopes are smooth and about 200 to 500 feet long. Areas of this soil are along ridges and streams and are long and winding. They range from 15 to about 50 acres.

Typically, the surface layer of this soil is very dark grayish brown and brown channery silt loam about 6

inches thick. The subsoil is yellowish brown, friable very channery silt loam about 8 inches thick. The substratum is about 4 inches thick. It is brownish yellow extremely channery loam and about 75 percent schist fragments. Bedrock is at a depth of 18 inches.

Included with this soil in mapping are small intermingled areas, generally less than 5 acres, of moderately well drained to somewhat poorly drained Lignum soils and well drained Nason and Tatum soils. The Lignum soils are in depressions and along small streams. The Nason and Tatum soils are scattered throughout the mapped area. Also included are small areas of soils that have a very channery surface. Included soils make up 20 percent of mapped areas.

Permeability is moderately rapid, and available water capacity is very low. Surface runoff is rapid. The hazard of erosion is severe. The natural fertility and the organic

matter content are low. The subsoil has low shrink-swell potential. The root zone extends to a depth of less than 20 inches. The surface layer and subsoil commonly are very strongly acid or extremely acid.

Most areas of this soil are in woodland. A very few areas are in pasture.

This soil is not suited to cultivated crops. It is droughty during the growing season. The hazard of erosion is severe and is a major management concern.

This soil is poorly suited to pasture and hay crops. Maintaining a mixture of grasses and legumes, adding lime and fertilizer according to soil tests, and overgrazing are major pasture management concerns. Proper stocking rates to maintain desirable grasses and legumes and controlled grazing are useful in pasture management.

Potential productivity for trees on this soil is moderate. The soil is managed mostly for loblolly and shortleaf pine. The survival of seeds and seedlings is severely affected by droughtiness during the growing season. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits safe operation of heavy equipment.

Depth to bedrock and slope are the main limitations for nonfarm uses.

This soil is in capability subclass VIIe.

**51E—Manteo channery silt loam, 25 to 45 percent slopes.** This steep, shallow, somewhat excessively drained soil is on side slopes. Slopes are smooth and about 200 to 400 feet long. Areas of this soil are along the ridges and streams and are long and winding. They range from 15 to about 50 acres.

Typically, the surface layer of this soil is very dark grayish brown and brown channery silt loam about 6 inches thick. The subsoil is yellowish brown, friable very channery silt loam about 8 inches thick. The substratum is about 4 inches thick. It is brownish yellow extremely channery loam and about 75 percent schist fragments. Bedrock is at a depth of 18 inches.

Included with this soil in mapping are small intermingled areas, generally less than 5 acres, of moderately well drained to somewhat poorly drained Lignum soils and well drained Nason soils. The Lignum soils are on foot slopes and along small streams. The Nason soils are scattered throughout the mapped area. Also included are small areas of soils that have a very channery surface layer. Included soils make up 20 percent of mapped areas.

Permeability is moderately rapid, and available water capacity is very low. Surface runoff is very rapid. The hazard of erosion is very severe. The natural fertility and the content of organic matter are low. The subsoil has low shrink-swell potential. The root zone extends to a depth of less than 20 inches. The surface layer and

subsoil commonly are very strongly acid or extremely acid.

Most areas of this soil are in woodland.

This soil is not suited to hay and cultivated crops. Steep slopes make use of modern tillage equipment impractical. The soil is droughty during the growing season. The hazard of erosion is severe and is a major management concern.

This soil is poorly suited to pasture crops. Maintaining a mixture of grasses and legumes, adding lime and fertilizer according to soil tests, and overgrazing are major pasture management concerns. Proper stocking rates to maintain desirable grasses and legumes and controlled grazing are useful in pasture management.

Potential productivity for trees on this soil is moderate. The soil is managed mostly for loblolly and shortleaf pine. The survival of seeds and seedlings is severely affected by droughtiness during the growing season. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits safe operation of heavy equipment.

Depth to bedrock and slope are the main limitations for nonfarm uses.

This soil is in capability subclass VIIe.

**52D—Manteo very channery silt loam, 15 to 25 percent slopes.** This moderately steep, shallow, somewhat excessively drained soil is on side slopes. Slopes are smooth and about 200 to 400 feet long. Areas of this soil are along ridges and streams and are long and winding. They range from 15 to about 30 acres.

Typically, the surface layer of this soil is very dark grayish brown and brown very channery silt loam about 6 inches thick. The subsoil is yellowish brown, friable very channery silt loam about 8 inches thick. The substratum is about 4 inches thick. It is brownish yellow extremely channery loam and about 75 percent schist fragments. Bedrock is at a depth of 18 inches.

Included with this soil in mapping are small intermingled areas, generally less than 3 acres, of moderately well drained to somewhat poorly drained Lignum soils and well drained Nason soils. The Lignum soils are on foot slopes and along small streams. The Nason soils are on the less steep positions. Also included are small areas of soils that have a channery surface layer. Included soils make up less than 20 percent of mapped areas.

Permeability is moderately rapid, and available water capacity is very low. Surface runoff is rapid. The hazard of erosion is severe. The natural fertility and the organic matter content are low. The subsoil has low shrink-swell potential. The root zone extends to a depth of less than 20 inches. The surface layer and subsoil commonly are very strongly acid or extremely acid.

Most areas of this soil are in woodland.

This soil is not suited to hay crops or cultivated crops. It is droughty during the growing season. The hazard of erosion is very severe and is a major management concern.

This soil is poorly suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes and overgrazing are major pasture management concerns. Proper stocking rates to maintain desirable grasses and legumes, control of grazing, weed control, and the use of lime and fertilizer according to soil tests are useful in pasture management. If the pasture is overgrazed, runoff is increased and soil losses from erosion are excessive.

Potential productivity for trees on this soil is moderate. The soil is managed mostly for loblolly and shortleaf pine. The survival of seeds and seedlings is severely affected by droughtiness during the growing season. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits safe operation of heavy equipment.

Depth to bedrock and slope are the main limitations for nonfarm uses.

This soil is in capability subclass VII<sub>s</sub>.

**52E—Manteo very channery silt loam, 25 to 45 percent slopes.** This steep, shallow, somewhat excessively drained soil is on side slopes. Slopes are smooth and about 200 to 400 feet long. Areas of this soil are along ridges and streams and are long and winding. They range from 15 to about 30 acres.

Typically, the surface layer of this soil is very dark grayish brown and brown very channery silt loam about 6 inches thick. The subsoil is yellowish brown, friable very channery silt loam about 8 inches thick. The substratum is about 4 inches thick. It is brownish yellow extremely channery loam and about 75 percent schist fragments. Bedrock is at a depth of 18 inches.

Included with this soil in mapping are small intermingled areas, generally less than 2 acres, of moderately well drained to somewhat poorly drained Lignum soils and well drained Nason soils. The Lignum soils are along small streams. The Nason soils are on the less steep positions. Also included are small areas of soils that have a channery surface layer. Included soils make up less than 10 percent of mapped areas.

Permeability is moderately rapid, and available water capacity is very low. Surface runoff is very rapid. The hazard of erosion is very severe. The natural fertility and the organic matter content are low. The subsoil has low shrink-swell potential. The root zone extends to a depth of less than 20 inches. The surface layer and subsoil commonly are very strongly acid or extremely acid.

Most areas of this soil are in woodland.

This soil is not suited to hay crops or cultivated crops. Steep slopes make use of modern tillage equipment impractical. The soil is droughty during the growing

season. The hazard of erosion is very severe and is a major management concern.

This soil is poorly suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes and overgrazing are major pasture management concerns. Proper stocking rates to maintain desirable grasses and legumes, controlled grazing, weed control, and use of lime and fertilizer according to soil tests are useful in pasture management. If the pasture is overgrazed, runoff increases and soil losses from erosion are excessive.

Potential productivity for trees on this soil is moderate. The soil is managed mostly for loblolly and shortleaf pine. The survival of seeds and seedlings is severely affected by droughtiness during the growing season. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits safe operation of heavy equipment.

The depth to bedrock and slope are the main limitations for nonfarm uses.

This soil is in capability subclass VII<sub>s</sub>.

**53B—Masada loam, 2 to 7 percent slopes.** This deep, gently sloping, well drained soil is on old river terraces that are higher than and some distance from the flood plains. Areas of this soil commonly are irregularly rounded or elongated. They range from 3 to about 20 acres or more.

Typically, the surface layer of this soil is dark brown loam, about 7 inches thick. The subsoil is mostly brown and yellowish red clay loam and clay about 55 inches thick.

Included with this soil in mapping are small areas of well drained Nason and Turbeville soils. The Nason soils are throughout the mapped area. The Turbeville soils are on the slightly higher positions. Also included are small areas of soils that have a gravelly surface layer and and severely eroded soils that have a surface layer of reddish brown clay loam. Included soils make up about 20 percent of mapped areas.

Permeability is moderate, and available water capacity is high. Surface runoff is medium. The hazard of erosion is moderate. This soil has good tilth. The surface layer is friable and easily tilled. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 60 inches or more. The organic matter content and the natural fertility are low to moderate. This soil commonly is strongly acid or very strongly acid throughout, but reaction of the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 6 feet.

Many areas of this soil are farmed. Some of the acreage is in woodland, and some is in pasture.

This soil is well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system,

and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, Virginia pine, yellow-poplar, and upland oaks do well on this soil.

The low strength, moderate shrink-swell potential, and the moderately permeable, clayey subsoil are the main limitations for nonfarm uses. The low strength and the shrink-swell potential limit use of this soil as a building site, and the clayey subsoil limits excavations. When wet, the clayey subsoil limits vehicular traffic in unpaved areas. The moderately permeable clayey subsoil limits use of the soil for most sanitary facilities. The low strength and excess fines limit the use of the soil as a source of roadfill.

This soil is in capability subclass IIe.

**53C—Masada loam, 7 to 15 percent slopes.** This deep, strongly sloping, well drained soil is on old river terraces that are higher than and some distance from the flood plains. Areas of this soil commonly are irregular in shape and are on the contour. They range from 3 to about 20 acres.

Typically, the surface layer of this soil is dark brown loam about 7 inches thick. The subsoil is mostly reddish brown and yellowish red clay loam and clay about 55 inches thick.

Included with this soil in mapping are small areas of well drained Nason and Turbeville soils. The Nason soils are throughout the mapped area. The Turbeville soils are on the slightly higher positions. Also included are small areas of soils that have a gravelly surface layer and severely eroded soils that have a reddish brown clay loam surface. Included soils make up about 20 percent of mapped areas.

Permeability is moderate, and available water capacity is high. Surface runoff is rapid. The hazard of erosion is severe. The surface layer is friable and easily tilled when moist, but breaks up into clods if the soil is tilled when too wet or too dry. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 60 inches or more. The organic matter content and the natural fertility are low. This soil commonly is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 6 feet.

Many areas of this soil are farmed. Some of the acreage is in woodland, and some is in pasture.

This soil is moderately well suited to cultivated crops. The severe hazard of erosion is a major management concern. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high, especially for loblolly pine, Virginia pine, yellow-poplar, and oaks. Seeds and seedlings survive and grow well if competing vegetation is controlled.

Slope, low strength, moderate shrink-swell potential, and moderately permeable, clayey subsoil are the main limitations for nonfarm uses. Slope, low strength, and shrink-swell potential limit use of this soil as a building site, and the clayey subsoil limits excavations. When wet, the clayey subsoil limits vehicular traffic. Slope and the moderately permeable, clayey subsoil limit use of the soil for most sanitary facilities. Slope is a limitation for recreational development. The low strength and excess fines limit the use of the soil as a source of roadfill.

This soil is in capability subclass IIIe.

**54B—Mayodan loam, 2 to 7 percent slopes.** This deep, gently sloping, well drained soil is on broad convex ridgetops. Slopes are smooth and about 400 to 800 feet long. Areas of this soil are irregularly rounded or elongated. They range from 3 to about 50 acres.

Typically, the surface layer of this soil is brown and yellowish brown loam about 10 inches thick. The subsoil is mostly strong brown clay loam and silty clay about 43 inches thick. The substratum is mostly red, weathered shale. Hard shale bedrock is at a depth of 60 inches.

Included with this soil in mapping are small areas of moderately well drained to somewhat poorly drained Creedmoor soils, well drained to moderately well drained Manassas soils, and well drained Penn and Totier soils. The Creedmoor and Manassas soils are in small upland depressions, around the heads of drainageways, and along drainageways. The Penn and Totier soils are scattered throughout the mapped area. Also included are small areas of soils that have a gravelly surface layer and small areas that have slopes of more than 7 percent. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is medium. The hazard of erosion is moderate. This soil has good tilth. The surface layer is friable and easily tilled. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content and the natural fertility are low. This soil commonly is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 60 inches.

Most areas of this soil are farmed. Some areas are in woodland.

This soil is well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. The high acidity and high content of aluminum are major limitations for this soil. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, Virginia pine, and oaks do well on this soil.

The low strength and the clayey, moderately permeable subsoil are the main limitations for nonfarm uses. The low strength limits use of this soil for local roads and streets, and the clayey subsoil limits excavations. When wet, the clayey subsoil limits vehicular traffic. The clayey, moderately permeable subsoil limits sanitary facilities. The low strength and excess fines limit use of this soil as a source of roadfill.

This soil is in capability subclass IIe.

**54C—Mayodan loam, 7 to 15 percent slopes.** This deep, strongly sloping, well drained soil is on convex side slopes. Slopes are smooth and about 300 to 600 feet long. Areas of this soil commonly are irregularly elongated along ridges and drainageways. They range from 3 to about 30 acres.

Typically, the surface layer of this soil is brown and yellowish brown loam about 10 inches thick. The subsoil is mostly strong brown clay loam and silty clay about 43 inches thick. The substratum is mostly red, weathered shale. Hard shale bedrock is at a depth of 60 inches.

Included with this soil in mapping are small areas of well drained to moderately well drained Manassas soils and well drained Penn and Totier soils. The Manassas soils are in depressions and along small drainageways.

The Penn and Totier soils are throughout the mapped area. Also included are small areas of soils that have a gravelly surface layer and small areas of soils that have slopes of less than 7 percent. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. The soil has good tilth. The surface layer is friable and easily tilled when moist. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content and the natural fertility are low. This soil commonly is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 60 inches.

Many areas of this soil are farmed. Some of the acreage is in woodland.

This soil is moderately well suited to cultivated crops. When lime and fertilizer are applied according to soil test, crops respond well. The high acidity and high content of aluminum are major limitations. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high, especially for loblolly pine, Virginia pine, yellow-poplar, and oaks. Seeds and seedlings survive and grow well if competing vegetation is controlled.

Slope, low strength, and a clayey, moderately permeable subsoil are the main limitations for nonfarm uses. Slope and the low strength limit use of this soil for local roads and streets, and the clayey subsoil limits excavations. When wet, the clayey subsoil limits vehicular traffic. Slope and the clayey, moderately permeable subsoil limit use of the soil for sanitary facilities. Slope is a limitation for recreational areas. The low strength and excess fines limit use of this soil as a source of roadfill.

This soil is in capability subclass IIIe.

**55B—McQueen loam, 2 to 7 percent slopes.** This deep, gently sloping, well drained soil is on terraces and benches. Areas of this soil commonly are irregularly rounded or elongated. They range from 3 to about 25 acres.

Typically, the surface layer of this soil is dark brown loam about 7 inches thick. The subsoil is mostly yellowish red clay and clay loam about 45 inches thick.

The substratum is multicolored strong brown and light yellowish brown sandy clay loam to a depth of 64 inches.

Included with this soil in mapping are small areas of moderately well drained Dogue soils, well drained Masada soils, and somewhat poorly drained Wahee soils. The Dogue and Wahee soils are in slight depressions and on the lower positions. The Masada soils are generally on the higher positions farthest from the stream. Also included are small areas of soils that have a gravelly surface layer and of severely eroded soils that have a surface layer of reddish brown clay loam. Included soils make up about 15 percent of mapped areas.

Permeability is slow, and available water capacity is moderate. Surface runoff is medium. The hazard of erosion is moderate. This soil has good tilth. The surface layer is friable and easily tilled. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 50 inches or more. The organic matter content is moderate, and the natural fertility is medium. This soil commonly is strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 6 feet. This soil is subject to rare flooding in some areas.

Many areas of this soil are farmed. Some of the acreage is in pasture.

This soil is well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, rotation of pasture, deferred grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil.

The low strength, rare flooding, and moderately permeable, clayey subsoil are the main limitations for nonfarm uses. The low strength and flooding limit use of this soil as a building site, and the clayey subsoil limits excavations. When wet, the clayey subsoil limits vehicular traffic in unpaved areas. The moderately permeable, clayey subsoil limits use of the soil for sanitary facilities. The moderately permeable subsoil and flooding are limitations for recreational development. The low strength and excess fines limit use of this soil as a source of roadfill.

This soil is in capability subclass IIe.

**56B—Meadowville loam, 2 to 7 percent slopes.** This deep, gently sloping, well drained to moderately well drained soil is on footslopes, in depressions, and along small drainageways. Most areas of this soil are long and winding. They range from 3 to about 15 acres.

Typically, the surface layer of this soil is dark brown loam about 14 inches thick. The subsoil is about 23 inches thick. It is mostly brown loam and clay loam. The substratum to a depth of 60 inches or more is brown loam.

Included with this soil in mapping are small areas of somewhat poorly drained Belvoir soils, well drained Starr soils, and poorly drained Worsham soils. The Belvoir and Worsham soils are mainly in the lowest positions and depressions. The Starr soils are throughout the mapped area. Also included are small areas of gravelly soils. Included soils make up about 25 percent of mapped areas.

Permeability is moderate to moderately rapid, and available water capacity is high. Surface runoff is medium. The hazard of erosion is moderate. The surface layer is friable and easily tilled through a wide range of soil moisture. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content is moderate, and the natural fertility is medium. This soil commonly is very strongly acid to medium acid throughout, but reaction in the surface layer is variable because of local liming. A seasonal high water table is at a depth of 3 to 5 feet during winter and spring. Bedrock is at a depth of more than 5 feet.

Most areas of this soil are farmed. Some areas are in pasture, and a few areas are in woodland.

This soil is well suited to cultivated crops. The moderate hazard of erosion and seepage from higher lying areas are major management concerns. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is wet causes compaction of the surface soil and damages stands of grasses and legumes.

Potential productivity for trees on this soil is high, especially for loblolly pine, yellow-poplar, sweetgum, and oaks. Seeds and seedlings survive and grow well.

The seasonal high water table, moderate shrink-swell potential, and moderate to moderately rapid permeability of the subsoil are the main limitations for nonfarm uses. The seasonal high water table and the shrink-swell

potential limit use of this soil as a building site. The permeability of the subsoil and the seasonal wetness are limitations for most sanitary facilities. Slope is a limitation for playgrounds. The low strength and excess fines limit use of the soil as source of roadfill.

This soil is in capability subclass IIe.

**56C—Meadowville loam, 7 to 15 percent slopes.**

This deep, strongly sloping, well drained to moderately well drained soil is on foot slopes, in depressions, and along small drainageways. Most areas of this soil are long and winding. They range from 3 to about 15 acres.

Typically, the surface layer of this soil is dark brown loam about 14 inches thick. The subsoil is mostly brown loam and clay loam about 32 inches thick. The substratum to a depth of 60 inches or more is brown loam.

Included with this soil in mapping are small areas of somewhat poorly drained Belvoir soils. The Belvoir soils are in depressions at the heads of drainageways. Also included are small areas of soils that have a gravelly surface layer and small areas of soils that have a clayey subsoil. Included soils make up about 20 percent of mapped areas.

Permeability is moderate to moderately rapid, and available water capacity is high. Surface runoff is rapid. The hazard of erosion is severe. The surface layer is friable and easily tilled through a wide range of soil moisture. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content is moderate, and the natural fertility is medium. This soil commonly is very strongly acid to medium acid throughout, but reaction in the surface layer is variable because of local liming. A seasonal high water table is at a depth of 3 to 5 feet during winter and early in spring. Bedrock is at a depth of more than 5 feet.

Most areas of this soil are farmed. Some areas are in pasture, and a few areas are in woodland.

This soil is moderately well suited to cultivated crops. The severe hazard of erosion and seepage from higher lying areas are major management concerns. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing and grazing when the soil is wet causes compaction of the surface soil and damages stands of grasses and legumes.

Potential productivity for trees on this soil is high, especially for loblolly pine, yellow-poplar, sweetgum, and oaks. Seeds and seedlings survive and grow well.

The seasonal high water table, slope, moderate shrink-swell potential, and moderate to moderately rapid permeability of the subsoil are the main limitations for nonfarm uses. The seasonal high water table, slope, and shrink-swell potential limit use of this soil as a building site. The slope, permeability of the subsoil, and seasonal wetness are limitations for most sanitary facilities. Slope is a limitation for recreational development. The low strength and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass IIIe.

**57B—Mount Lucas silt loam, 2 to 7 percent slopes.**

This deep, gently sloping, moderately well drained to somewhat poorly drained soil is on foot slopes, in upland depressions, and along intermittent drainageways. Most areas of this soil are irregularly long and winding. They range from 3 to about 15 acres.

Typically, the surface layer of this soil is dark yellowish brown silt loam about 10 inches thick. The upper 20 inches of the subsoil is mostly yellowish brown and brownish yellow clay loam and silty clay loam and has gray mottles below a depth of about 14 inches. The lower 18 inches of the subsoil is reddish yellow and light gray clay and has yellowish brown mottles. The substratum to a depth of 64 inches or more is strong brown silty clay loam and is mottled gray, black, and yellowish brown.

Included with this soil in mapping are small areas of well drained Myersville, Rabun, and Starr soils and poorly drained Worsham soils. The Myersville and Rabun soils are on the higher positions mainly close to the uplands. The Starr soils are on the higher positions throughout the mapped area. The Worsham soils are on the slightly lower positions throughout the mapped area. Also included are small areas of soils that have slopes of less than 2 percent or slopes of more than 7 percent and areas of soils that have a thicker surface layer than typical. Included soils make up about 20 percent of mapped areas.

Permeability is slow, and available water capacity is high. Surface runoff is medium. The hazard of erosion is moderate. The surface layer is friable, and tilth is good. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches or more. Depth to bedrock is more than 4 feet. The organic matter content is low, and the natural fertility is medium. This soil commonly is medium acid to neutral throughout. A seasonal high water table is at a depth of 1/2 foot to 3 feet during winter and early in spring.

Most areas of this soil are in pasture or woodland.

This soil is well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. The soil is wet and cold early in spring,

and wetness commonly interferes with early tillage. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth, reduce crusting, and increase water infiltration.

This soil is well suited to most pasture and hay crops. Alfalfa commonly is short lived because of seasonal wetness. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlling grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is wet causes compaction of the surface soil and damages stands of grasses and legumes.

Potential productivity for trees on this soil is high, especially for loblolly pine, yellow-poplar, sweetgum, and oaks. Seeds and seedlings survive and grow well. The soil is soft when wet, and the use of heavy equipment is limited during wet periods.

Shallow depth to the seasonal high water table, moderate shrink-swell potential, clayey subsoil, and slow permeability of the subsoil are the main limitations for nonfarm uses. The seasonal high water table and moderate shrink-swell potential limit use of this soil as a building site. The slowly permeable, clayey subsoil and the seasonal wetness are limitations for most sanitary facilities. The seasonal wetness is a limitation for recreational development. Wetness and excess fines limit the use of the soil as a source of roadfill.

This soil is in capability subclass IIe.

#### **58B—Myersville silt loam, 2 to 7 percent slopes.**

This deep, gently sloping, well drained soil is on narrow, weakly convex ridgetops. Slopes are smooth and 100 to 300 feet long. Areas of this soil range from 3 to about 25 acres.

Typically, the surface layer of this soil is dark brown and brown silt loam about 7 inches thick. The subsoil is mostly yellowish red silty clay loam and silt loam about 29 inches thick. The substratum to a depth of at least 65 inches is mostly weathered greenstone in shades of brown, yellow, red, and black that crushes to silt loam.

Included with this soil in mapping are small areas of well drained Catocin, Fauquier, and Rabun soils. The Catocin soils are near the breaks to steeper slopes and around outcrops of rock. The Fauquier and Rabun soils are scattered throughout the mapped area. Also included are small areas of soils that have stones on the surface and severely eroded soils that have a yellowish red silty clay loam surface layer. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Runoff is medium. The hazard of erosion is moderate: This soil has good tilth. The surface layer is friable and easily tilled. The subsoil has low shrink-swell potential. The root zone extends to a depth of at least

40 inches. The organic matter content is low to moderate, and the natural fertility is medium. This soil commonly is very strongly acid to medium acid throughout, but reaction in the surface layer and upper part of the B horizon is variable because of local liming. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are farmed or in pasture and hay crops. Some areas are in woodland.

This soil is well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Minimum tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is very high. The soil is managed mostly for hardwoods. Seeds and seedlings survive and grow well if competing vegetation is controlled. Black walnut, yellow-poplar, and loblolly pine grow well on this soil.

The moderately permeable subsoil and depth to rock are the main limitations for nonfarm uses. The moderate permeability and depth to rock limit use of this soil for some sanitary facilities. Slope and the easily erodible surface layer are limitations for some recreational areas. The low strength and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass IIe.

#### **58C—Myersville silt loam, 7 to 15 percent slopes.**

This deep, strongly sloping, well drained soil is on narrow, convex ridgetops and side slopes. Slopes are smooth and 100 to 400 feet long. Areas of this soil range from 3 to about 30 acres.

Typically, the surface layer of this soil is dark brown and brown silt loam about 7 inches thick. The subsoil is mostly yellowish red silty clay loam and silt loam about 29 inches thick. The substratum to a depth of at least 65 inches is mostly weathered greenstone in shades of brown, yellow, red, and black that crushes to silt loam.

Included with this soil in mapping are small areas of well drained Catocin, Fauquier, and Rabun soils. The Catocin soils are near the breaks to steeper slopes and around outcrops of rock. The Fauquier and Rabun soils are scattered throughout the mapped area. Also included are small areas of soils that have stones on the surface and severely eroded soils that have a yellowish red silty clay loam surface layer. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The surface layer is friable and easily tilled. The subsoil has low shrink-swell potential. The root zone extends to a depth of at least 40 inches. The organic matter content is low to moderate, and the natural fertility is medium. This soil commonly is very strongly acid to medium acid throughout, but reaction in the surface layer and upper part of the B horizon is variable because of local liming. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are farmed or in pasture and hay crops. Some areas are in woodland.

This soil is moderately well suited to cultivated crops. The severe hazard of erosion is a major management concern. When lime and fertilizer are applied according to soil tests, crops respond well. Minimum tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, rotation of pasture, deferred grazing, and the use of lime and fertilizer help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is very high. The soil is managed mostly for hardwoods. Seeds and seedlings survive and grow well if competing vegetation is controlled. Black walnut, yellow-poplar, and loblolly pine do well on this soil.

The slope, moderately permeable subsoil, and depth to rock are the main limitations for nonfarm uses. Slope limits use of this soil for building sites. Slope, moderate permeability, and depth to rock are limitations for most sanitary facilities. Slope and the easily erodible surface layer are limitations for recreational development. The low strength and excess fines limit use of this soil as a source of roadfill.

This soil is in capability subclass IIIe.

#### **58D—Myersville silt loam, 15 to 25 percent slopes.**

This deep, moderately steep, well drained soil is on convex side slopes. Slopes are smooth and 200 to 500 feet long. Areas of this soil range from 5 to about 50 acres.

Typically, the surface layer of this soil is dark brown and brown silt loam about 7 inches thick. The subsoil is mostly yellowish red silty clay loam and silt loam about 29 inches thick. The substratum to a depth of at least 65 inches is mostly weathered greenstone in shades of brown, yellow, red, and black that crushes to silt loam.

Included with this soil in mapping are small areas of well drained Catoctin and Fauquier soils. The Catoctin

soils are near breaks to steeper slopes and around outcrops of rock. The Fauquier soils are scattered throughout the mapped area. Also included are small areas of soils that have stones on the surface and severely eroded soils that have a yellowish red silty clay loam surface layer. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The surface layer is friable and easily tilled. The subsoil has low shrink-swell potential. The root zone extends to a depth of at least 40 inches. The organic matter content is low to moderate, and the natural fertility is medium. This soil commonly is very strongly acid to medium acid throughout, but reaction in the surface layer and upper part of the B horizon is variable because of local liming. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are in pasture or woodland.

This soil is poorly suited to cultivated crops. The severe hazard of erosion is a major management concern. When lime and fertilizer are applied according to soil tests, crops respond well. Minimum tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, rotation of pasture, deferred grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. The soil is managed mostly for hardwoods. Seeds and seedlings survive and grow well if competing vegetation is controlled. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits safe operation of heavy equipment. Black walnut, yellow-poplar, and loblolly pine do well on this soil.

Slope and depth to rock are the main limitations for nonfarm uses. Slope limits this soil for use as a building site and for recreational development. Slope and the depth to rock are limitations for most sanitary facilities. The low strength and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass IVe.

#### **58E—Myersville silt loam, 25 to 45 percent slopes.**

This deep, steep, well drained soil is on convex side slopes. Slopes are smooth and 200 to 500 feet long. Areas of this soil range from 5 to about 50 acres.

Typically, the surface layer of this soil is dark brown and brown silt loam about 7 inches thick. The subsoil is

mostly yellowish red silty clay loam and silt loam about 29 inches thick. The substratum to a depth of more than 60 inches is mostly weathered greenstone in shades of brown, yellow, red, and black that crushes to silt loam.

Included with this soil in mapping are small areas of well drained Catoclin and Fauquier soils. These soils are throughout the mapped area. Also included are small areas of soils that have stones on the surface and severely eroded soils that have a yellowish red silty clay loam surface layer. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Runoff is very rapid. The hazard of erosion is very severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of at least 40 inches. The organic matter content is low, and the natural fertility is medium. This soil commonly is very strongly acid to medium acid throughout, but reaction in the surface layer and upper part of the B horizon is variable because of local liming. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are in woodland. Some areas are in pasture.

This soil is not suited to hay and cultivated crops. The steep slope makes use of modern equipment impractical.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. The soil is managed mostly for hardwoods. Seeds and seedlings survive and grow well if competing vegetation is controlled. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits safe operation of heavy equipment. Black walnut, yellow-poplar, and loblolly pine do well on this soil.

Slope and depth to rock are the main limitations for nonfarm uses. Slope limits this soil for use as a building site and for recreational development. Slope and depth to rock are limitations for most sanitary facilities. The slope, low strength, and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass VIe.

**59C—Myersville very stony silt loam, 7 to 15 percent slopes.** This deep, strongly sloping, well drained soil is on convex ridgetops and side slopes. Stones, 3 to 10 feet apart, cover about 3 to 15 percent of the surface. Slopes are smooth and 300 to 1,000 feet long. Areas of this soil range from 5 to about 30 acres.

Typically, the surface layer of this soil is dark brown and brown silt loam about 7 inches thick. The subsoil is mostly yellowish red silty clay loam and silt loam about

29 inches thick. The substratum to a depth of at least 65 inches is mostly weathered greenstone in shades of brown, yellow, red, and black that crushes to silt loam.

Included with this soil in mapping are small areas of well drained Catoclin and Rabun soils. The Catoclin soils are near breaks to steeper slopes and around outcrops of rock. The Rabun soils are throughout the mapped area. Also included are areas of soils that have slopes of less than 7 percent and small areas of soils that do not have stones on the surface. The included soils and outcrops make up about 15 percent of mapped areas.

Permeability and available water capacity are moderate. Runoff is rapid. The hazard of erosion is severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of at least 40 inches. The organic matter content is low to moderate, and the natural fertility is medium. This soil commonly is very strongly acid to medium acid throughout, but reaction in the surface layer and upper part of the B horizon is variable because of local liming. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are in woodland or pasture.

This soil is not suited to hay and cultivated crops. The stones on the surface make use of modern equipment impractical.

This soil is moderately well suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, rotation of pasture, deferred grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is very high. The soil is managed mostly for hardwoods. Seeds and seedlings survive and grow well if competing vegetation is controlled. Black walnut, yellow-poplar, and loblolly pine do well on this soil.

Slope, moderately permeable subsoil, depth to rock, and large stones are the main limitations for nonfarm uses. Slope limits this soil for use as a building site. Slope, moderate permeability, and large stones are limitations for sanitary facilities. Slope and large stones limit use of the soil for recreational development. The low strength and excess fines limit use of this soil as a source of roadfill.

This soil is in capability subclass VIi.

**59D—Myersville very stony silt loam, 15 to 25 percent slopes.** This deep, moderately steep, well drained soil is on narrow, convex ridgetops and side slopes. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Slopes are smooth and 300 to 1,000 feet long. Areas of this soil range from 5 to about 50 acres.

Typically, the surface layer of this soil is dark brown and brown silt loam about 7 inches thick. The subsoil is mostly yellowish red silty clay loam and silt loam about 29 inches thick. The substratum to a depth of at least 65

inches is mostly weathered greenstone in shades of brown, yellow, red, and black that crushes to silt loam.

Included with this soil in mapping are small areas of well drained Catoctin and Rabun soils. The Catoctin soils are near breaks to steeper slopes and around outcrops of rock. The Rabun soils are throughout the mapped area. Also included are small areas of soils that do not have stones on the surface and small areas of soils that are extremely stony. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Runoff is rapid. The hazard of erosion is severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of at least 40 inches. The organic matter content is low to moderate, and the natural fertility is medium. This soil commonly is very strongly acid to medium acid throughout, but reaction in the surface layer and upper part of the B horizon is variable because of local liming. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are in woodland or pasture.

This soil is not suited to hay and cultivated crops. The stones on the surface make use of tillage equipment impractical.

This soil is moderately well suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. The soil is managed mostly for hardwoods. Seeds and seedlings survive and grow well if competing vegetation is controlled. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits safe operation of heavy equipment. Black walnut, yellow-poplar, and loblolly pine do well on this soil.

Slope, depth to rock, and large stones are the main limitations for nonfarm uses. Slope limits this soil for use as a building site. Slope and depth to rock are limitations for most sanitary facilities. Slope is a limitation for recreational development, and large stones limit playgrounds. The low strength and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass VI<sub>s</sub>.

**59E—Myersville very stony silt loam, 25 to 45 percent slopes.** This deep, steep, well drained soil is on side slopes. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Slopes are smooth and 200 to 1,000 feet long. Areas of this soil range from 10 to about 50 acres.

Typically, the surface layer of this soil is dark brown and brown silt loam about 7 inches thick. The subsoil is mostly yellowish red silty loam and silt loam about

29 inches thick. The substratum to a depth of at least 65 inches is mostly weathered greenstone in shades of brown, yellow, red, and black that crushes to silt loam.

Included with this soil in mapping are small areas of well drained Catoctin and Rabun soils. The Catoctin and Rabun soils are scattered throughout the mapped area. Also included are small areas of soils that do not have stones on the surface and small areas of extremely stony soils. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Runoff is very rapid. The hazard of erosion is very severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of at least 40 inches. The organic matter content is low to moderate, and the natural fertility is medium. This soil commonly is very strongly acid to medium acid throughout, but reaction in the surface layer and upper part of the B horizon is variable because of local liming. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are in woodland.

This soil is not suited to hay and cultivated crops. The steep slope and large stones on the surface make use of modern tillage equipment impractical.

This soil is poorly suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, rotation of pasture, deferred grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. The soil is managed mostly for hardwoods. Seeds and seedlings survive and grow well if competing vegetation is controlled. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits safe operation of heavy equipment. Black walnut, yellow-poplar, and loblolly pine do well on this soil.

Slope, depth to rock, and large stones are the main limitations for nonfarm uses. Slope limits this soil for use as a building site. Slope and the depth to rock are limitations for most sanitary facilities. Slope is a limitation for recreational development, and large stones limit use of the soil for playgrounds. The slope, low strength, and excess fines limit use of this soil as a source of roadfill.

This soil is in capability subclass VII<sub>s</sub>.

**60C—Myersville-Catoclin very stony silt loams, 7 to 15 percent slopes.** This map unit is made up of deep and moderately deep, strongly sloping, well drained soils on narrow, convex ridgetops. Stones 3 to 10 feet apart cover 3 to 15 percent of the surface. Slopes are smooth and about 300 to 600 feet long. Areas of this map unit are irregularly elongated. They range from 5 to about 50 acres.

The map unit is about 70 percent Myersville soils and 25 percent Catoctin soils. Other soils make up the rest. The areas of individual soils are so small or so intermingled that to separate them in mapping was not practical.

Typically, the surface layer of the Myersville soil is dark brown and brown silt loam about 7 inches thick. The subsoil extends to a depth of 36 inches. It is mostly yellowish red silty clay loam and silt loam. The substratum to a depth of 65 inches or more is mostly weathered greenstone in shades of yellow, brown, red, and black that crushes to silt loam.

Typically, the surface layer of the Catoctin soil is dark yellowish brown silt loam about 8 inches thick. The subsoil is strong brown very channery silt loam about 13 inches thick. It contains pockets of reddish brown silty clay loam. The substratum to a depth of 28 inches is yellowish brown extremely channery silt loam. Hard greenstone rock is at a depth of 28 inches.

Included with these soils in mapping are small areas of well drained Lew soils. The Lew soils are along small streams and in positions that collect material from higher surrounding soils. Also included are ledges and outcrops of greenstone, areas of soils that have slopes of less than 7 percent, and areas of extremely stony soils. The included soils and outcrops make up about 55 percent of mapped areas.

Permeability is moderate in the Myersville soil and moderately rapid in the Catoctin soil. The available water capacity is moderate in the Myersville soil and low in the Catoctin soil. The surface layer of these soils is friable, but large stones make tillage impractical. These soils have low shrink-swell potential. In the Myersville soil the root zone extends to a depth of 40 inches or more and in the Catoctin soil extends to a depth of about 24 inches. The organic matter content is moderate, and the natural fertility is medium. The soils commonly are medium acid or strongly acid. Depth to bedrock is generally more than 5 feet in the Myersville soil and within a depth of 40 inches in the Catoctin soil.

Nearly all of this map unit is in woodland.

Areas of these soils are not suited to hay and cultivated crops. Large stones on the surface make use of modern equipment impractical.

Areas are moderately well suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes and overgrazing are major pasture management concerns. Proper stocking rates to maintain desirable grasses and legumes, rotating of pasture, deferred grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees is very high for the Myersville soils and moderate for the Catoctin soils. These soils are managed mainly for hardwoods. Seeds and seedlings do well on the Myersville soils if

competing vegetation is controlled, but they are affected by droughtiness during the growing season on the Catoctin soils. Black walnut, yellow-poplar, white and red oaks, and loblolly pine do well on these soils.

Slope, depth to bedrock, and large stones are the main limitations for nonfarm uses. Depth to bedrock, slope, and large stones limit use of this unit as a site for sanitary facilities. Slope and the depth to bedrock are limitations for building sites. Slope and large stones limit recreational development. The low strength and excess fines limit use of these soils as a source of roadfill.

This map unit is in capability subclass VIs.

**60D—Myersville-Catoctin very stony silt loams, 15 to 25 percent slopes.** This unit is made up of deep and moderately deep, moderately steep, well drained soils on narrow, convex ridgetops and convex side slopes. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Slopes are smooth and about 500 to 1,000 feet long. Areas of this map unit are irregularly elongated. They range from 5 to more than 50 acres.

The map unit is about 60 percent Myersville soils and 30 percent Catoctin soils. Other soils make up the rest. The areas of individual soils are so small or so intermingled that to separate them in mapping was not practical.

Typically, the surface layer of the Myersville soil is dark brown and brown silt loam about 7 inches thick. The subsoil extends to a depth of 36 inches. It is mostly yellowish red silty clay loam and silt loam. The substratum to a depth of 65 inches or more is mostly weathered greenstone in shades of yellow, brown, red, and black that crushes to silt loam.

Typically, the surface layer of the Catoctin soil is dark yellowish brown silt loam about 8 inches thick. The subsoil is strong brown very channery silt loam about 13 inches thick. It contains pockets of reddish brown silty clay loam. The substratum to a depth of 28 inches is yellowish brown extremely channery silt loam. Hard greenstone rock is at a depth of 28 inches.

Included with these soils in mapping are small areas of well drained Lew soils. The Lew soils are along small streams and in positions that collect material from higher surrounding soils. Also included are ledges and outcrops of greenstone and areas of extremely stony soils. The included soils and outcrops make up about 10 percent of mapped areas.

Permeability is moderate in the Myersville soil and moderately rapid in the Catoctin soil. The available water capacity is moderate in the Myersville soil and low in the Catoctin soil. The surface layer of these soils is friable, but large stones make tillage impractical. These soils have low shrink-swell potential. In the Myersville soil the root zone extends to a depth of 40 inches or more and in the Catoctin soil extends to a depth of about 24 inches. The organic matter content is low to moderate, and the natural fertility is medium. The soils commonly

are medium acid or strongly acid. Depth to bedrock is generally more than 5 feet in the Myersville soil and 40 inches or less in the Catoctin soil.

Nearly all of this map unit is in woodland.

Areas of these soils are not suited to hay and cultivated crops. Large stones on the surface make use of modern tillage equipment impractical.

Areas are moderately well suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes and overgrazing are major pasture management concerns. Proper stocking rates to maintain desirable grasses and legumes, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees is high for the Myersville soils and moderate for the Catoctin soils. These soils are managed mainly for hardwoods. Seeds and seedlings survive and grow well on the Myersville soils if competing vegetation is controlled, but they are affected by droughtiness during the growing season on the Catoctin soils. Black walnut, yellow-poplar, white and red oaks, and loblolly pine do well on these soils. The steep slope limits the safe use of logging equipment. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion.

The slope, depth to bedrock, and large stones are the main limitations for nonfarm uses. Depth to bedrock, slope, and large stones limit use of this map unit as a site for sanitary facilities. Slope and the depth to bedrock are limitations for building sites. Slope and large stones limit recreational development. Slope, low strength, and excess fines limit use of these soils as a source of roadfill.

This map unit is in capability subclass VIIc.

**60E—Myersville-Catoctin very stony silt loams, 25 to 60 percent slopes.** This map unit is made up of deep and moderately deep, steep to very steep, well drained soils on convex side slopes and mountainsides. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Slopes are smooth and about 500 to 2,000 feet long. Areas of this map unit are wide and irregularly elongated. They range from 50 to about 200 acres.

The map unit is about 60 percent Myersville soils and 30 percent Catoctin soils. Other soils make up the rest. The areas of individual soils are so small or so intermingled that to separate them in mapping was not practical.

Typically, the surface layer of the Myersville soil is dark brown and brown silt loam about 7 inches thick. The subsoil extends to a depth of 36 inches. It is mostly yellowish red silty clay loam and silt loam. The substratum to a depth of 65 inches or more is mostly

weathered greenstone in shades of yellow, brown, red, and black that crushes to silt loam.

Typically, the surface layer of the Catoctin soil is dark yellowish brown silt loam about 8 inches thick. The subsoil is strong brown very channery silt loam about 13 inches thick. It contains pockets of reddish brown silty clay loam. The substratum to a depth of 28 inches is yellowish brown extremely channery silt loam. Hard greenstone is at a depth of 28 inches.

Included with these soils in mapping are small areas of well drained Lew soils. The Lew soils are along small streams and in positions that collect material from higher surrounding soils. Also included are ledges and outcrops of greenstone, areas of soils that have slopes of less than 25 percent, and areas of extremely stony soils. The included soils and outcrops make up about 10 percent of mapped areas.

Permeability is moderate in the Myersville soil and moderately rapid in the Catoctin soil. The available water capacity is moderate in the Myersville soil and low in the Catoctin soil. The surface layer of these soils is friable, but large stones make tillage impractical. These soils have low shrink-swell potential. In the Myersville soil the root zone extends to a depth of 40 inches or more and in the Catoctin soil extends to a depth of about 24 inches. The organic matter content is low to moderate, and the natural fertility is medium. The soils commonly are medium acid or strongly acid. Depth to bedrock is generally more than 5 feet in the Myersville soil and less than 40 inches in the Catoctin soil.

Nearly all of this map unit is in woodland.

Areas of these soils are not suited to hay and cultivated crops. The steep slope and large stones on the surface make use of modern tillage equipment impractical.

Areas are poorly suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes and overgrazing are major pasture management concerns. Proper stocking rates to maintain desirable grasses and legumes, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees is high to moderate. These soils are managed mainly for hardwoods. Seeds and seedlings survive and grow well on the Myersville soils if competing vegetation is controlled, but they are affected by droughtiness during the growing season on the Catoctin soils. Black walnut, yellow-poplar, white and red oaks, and loblolly pine do moderately well on these soils. The steep slope limits the safe use of logging equipment. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion.

The slope, depth to bedrock, and large stones are the main limitations for nonfarm uses. Depth to bedrock and slope limit use of this map unit as a site for sanitary

facilities. Slope and the depth to bedrock are limitations for building sites. Slope and large stones limit recreational development. Slope, low strength, and excess fines limit use of these soils as a source of roadfill.

This map unit is in capability subclass VII<sub>s</sub>.

**61D—Myersville-Rock outcrop complex, 15 to 25 percent slopes.** This complex is made up of deep, moderately steep, well drained soils and outcrops of greenstone on side slopes of Southwestern Mountain. Areas are irregularly elongated and range from 10 to 50 acres.

The complex is about 60 percent Myersville very stony silt loam and 25 percent Rock outcrop. Other soils make up the rest. The areas of individual soils and Rock outcrop are so small or so intermingled that to separate them in mapping was not practical.

Typically, the surface layer of the Myersville soil is dark brown and brown silt loam about 7 inches thick. The subsoil is mostly yellowish red silty clay loam and silt loam about 29 inches thick. The substratum to a depth of 65 inches or more is mostly weathered greenstone in shades of brown, yellow, red, and black that crushes to silt loam.

Rock outcrop ranges in height from a few inches to more than 10 feet. Vertical faces are exposed on bluffs in some areas.

Included in mapping are small areas of well drained Catocin and Starr soils. The Catocin soils are throughout the mapped area. The Starr soils are on foot slopes and along drainageways. Also included are small areas that have 50 to 90 percent Rock outcrop, areas that have an extremely stony surface layer, and areas that have slopes of more than 25 percent. Loose rock fragments are on the surface in some areas, especially in or near drainageways. Included soils make up about 15 percent of mapped areas.

Permeability in the Myersville soil is moderate, and available water capacity is moderate. Surface runoff is rapid. The hazard of erosion is severe, and past erosion has exposed many outcrops of rock and rock fragments on the surface. The subsoil has low shrink-swell potential. The root zone is 40 inches or more in depth. The organic matter content is low to moderate, and the natural fertility is medium. The soil commonly is strongly acid or medium acid. Bedrock is generally deeper than 5 feet in the Myersville soil.

Most areas of this complex are in woodland. A few areas are in pasture.

This complex is not suited to hay or cultivated crops. Rock outcrop, rock fragments, and slope make the use of modern farm machinery impractical.

The Myersville soil is poorly suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes and overgrazing are major pasture management concerns. Proper stocking rates to maintain desirable

grasses and legumes, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

The potential productivity for trees on the Myersville soil is high. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, and girdling. Rock outcrop, rock fragments, slope, and erosion are the major hazards or limitations to the growing and harvesting of trees on this complex. Black walnut, yellow-poplar, and loblolly pine do well.

This complex is limited for most community development and recreational uses because of the Rock outcrop, rock fragments, and slope. These features also limit the use of this complex as a source of roadfill. This complex is poor for use as openland wildlife habitat and good for use as woodland wildlife habitat.

This complex is in capability subclass VII<sub>s</sub>.

**61E—Myersville-Rock outcrop complex, 25 to 45 percent slopes.** This complex is made up of deep, steep, well drained soils and outcrops of greenstone on side slopes and along V-shaped valleys of Southwestern Mountain. Areas are irregularly elongated and range from 10 to about 50 acres.

The complex is about 60 percent Myersville very stony silt loam and 25 percent Rock outcrop. Other soils make up the rest. The areas of individual soils and Rock outcrop are so small or so intermingled that to separate them in mapping was not practical.

Typically, the surface layer of the Myersville soil is dark brown and brown silt loam about 7 inches thick. The subsoil is mostly yellowish red silty clay loam and silt loam about 29 inches thick. The substratum to a depth of 65 inches or more is mostly weathered greenstone in shades of brown, yellow, red, and black that crushes to silt loam.

Rock outcrop ranges in height from a few inches to more than 10 feet. Vertical faces are exposed on bluffs in some areas.

Included in mapping are small areas of well drained Catocin and Rabun soils. These soils are throughout the mapped area. Also included are small areas that have 50 to 90 percent Rock outcrop, areas that have an extremely stony surface layer, and areas that have slopes of more than 45 percent. Loose rock fragments are on the surface in some areas, especially in or near drainageways. Included soils make up about 15 percent of mapped areas.

Permeability in the Myersville soil is moderate, and available water capacity is moderate. Surface runoff is very rapid. The hazard of erosion is very severe, and past erosion has exposed many outcrops of rock and rock fragments on the surface. The subsoil has low

shrink-swell potential. The root zone is 40 inches or more in depth. The organic matter content is low to moderate, and the natural fertility is medium. The soil commonly is strongly acid or medium acid. Bedrock is generally deeper than 5 feet in the Myersville soil.

Most areas of this complex are in woodland. A few of the less sloping areas are in pasture.

This complex is not suited to hay or cultivated crops. Rock outcrop, rock fragments, and slope make the use of modern machinery impractical.

The Myersville soil is poorly suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes and overgrazing are major pasture management concerns. Proper stocking rates to maintain desirable grasses and legumes, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

The potential productivity for trees on the Myersville soil is high. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation including cutting, spraying, and girdling. Slope, Rock outcrop, rock fragments, and erosion are the major hazards or limitations to the growing and harvesting of trees on this complex. The use of machinery is restricted by the steep slope and rocks. Black walnut, yellow-poplar, and loblolly pine do well.

This complex is limited for most community development and recreational uses because of slope, Rock outcrop, and rock fragments. These features also limit the use of this complex as a source of roadfill. This complex is poor for openland wildlife habitat and good for woodland wildlife habitat.

This complex is in capability subclass VIIc.

**62B—Nason silt loam, 2 to 7 percent slopes.** This deep, gently sloping, well drained soil is on convex ridgetops. Areas of this soil are commonly irregularly rounded or oblong. They range from 5 to about 150 acres.

Typically, the surface layer of this soil is grayish brown and yellowish brown silt loam about 8 inches thick. The subsoil is mostly yellowish red and strong brown silty clay loam and silty clay about 31 inches thick. The substratum to a depth of 50 inches is mostly strong brown, yellowish brown, and red channery silt loam.

Included with this soil in mapping are small areas of somewhat poorly drained Lignum soils, well drained Tatum soils, and somewhat excessively drained Manteo soils. The Tatum soils are scattered throughout the mapped area. The Lignum soils are mainly along drainageways. The Manteo soils are mainly on the steeper positions. Also included are small areas of soils that have a channery surface layer and of severely eroded soils that have a surface layer of yellowish brown

silty clay loam. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is medium. The hazard of erosion is moderate. This soil has good tilth. The surface layer is friable and easily tilled. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 30 inches or more. The organic matter content and the natural fertility are low to moderate. This soil commonly is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Depth to rippable bedrock ranges from 40 to more than 60 inches.

Most areas of this soil are in woodland. Some of the acreage is farmed.

This soil is well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. The high acidity and high content of aluminum are major limitations for this soil. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil.

The low strength, moderate shrink-swell potential, and moderately permeable, clayey subsoil are the main limitations for nonfarm uses. The low strength and the shrink-swell potential limit use of this soil as a building site, and the clayey subsoil limits excavations. When wet, the clayey subsoil limits vehicular traffic. The moderately permeable subsoil limits use of the soil for septic tank absorption fields. Permeability in the substratum commonly is not a limiting factor for septic tank absorption fields. The low strength and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass IIc.

**62C—Nason silt loam, 7 to 15 percent slopes.** This deep, strongly sloping, well drained soil is on convex ridgetops, the points of ridges, and narrow convex side slopes. Areas of this soil commonly are long and winding. They range from 20 to 150 acres.

Typically, the surface layer of this soil is grayish brown and yellowish brown silt loam about 8 inches thick. The subsoil is mostly yellowish red and strong brown silty clay loam and silty clay about 31 inches thick. The

substratum to a depth of 50 inches is mostly strong brown, yellowish brown, and red channery silt loam.

Included with this soil in mapping are small areas of moderately well drained Abell soils, somewhat excessively drained Manteo soils, and well drained Tatum soils. The Abell soils are along drainageways and small streams. The Manteo soils are mostly on the steeper slopes. The Tatum soils are throughout the mapped area. Also included are small areas of channery soils and small areas of severely eroded soils that have a yellowish brown silty clay loam surface layer. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is medium to rapid. The hazard of erosion is severe. This soil has good tilth. The surface layer is friable and easily tilled when moist but breaks up into clods if tilled when the soil is too wet or too dry. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 30 inches or more. The organic matter content and the natural fertility are low to moderate. This soil is commonly strongly acid or very strongly acid, but reaction in the surface layer is variable because of local liming. Depth to rippable bedrock ranges from 40 to more than 60 inches.

Most areas of this soil are in woodland. Some areas are farmed, and a few areas are in pasture.

This soil is moderately well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. The high acidity and high content of aluminum are major limitations for this soil. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, rotation of pasture, deferred grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high, especially for loblolly pine, Virginia pine, yellow-poplar, and oaks. Seeds and seedlings survive and grow well if competing vegetation is controlled.

The slope, low strength, moderate shrink-swell potential, and moderately permeable, clayey subsoil are the main limitations for nonfarm uses. Slope, the low strength, and the shrink-swell potential limit use of this soil as a building site, and the clayey subsoil limits excavations. When wet, the clayey subsoil limits vehicular traffic. Slope and the slow percolation rate limit use of the soil for septic tank absorption fields and for recreational areas. Permeability of the substratum commonly is not a limiting factor for septic tank

absorption fields. The low strength and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass IIIe.

**62D—Nason silt loam, 15 to 25 percent slopes.** This deep, moderately steep, well drained soil is on convex side slopes. Areas of this soil are slightly elongated or long and winding. They range from 3 to 30 acres.

Typically, the surface layer of this soil is yellowish brown silt loam about 8 inches thick. The subsoil is mostly yellowish brown and strong brown silty clay loam and silty clay about 31 inches thick. The substratum to a depth of 50 inches is mostly strong brown, yellowish brown, and red channery silt loam.

Included with this soil in mapping are small areas of somewhat poorly drained Lignum soils, moderately well drained Abell soils, and somewhat excessively drained Manteo soils. The Lignum soils are along drainageways and small streams. The Abell soils are on foot slopes and along small drainageways. The Manteo soils are scattered throughout the mapped area. Also included are small areas of soils that have a gravelly surface layer, areas of severely eroded soils that have a yellowish brown silty clay loam surface layer, and small areas of gullied soils mainly on the lower part of slopes. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The surface layer is moderately friable and easily tilled when moist. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 30 inches or more. The organic matter content and the natural fertility are low to moderate. This soil is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Depth to rippable bedrock ranges from 40 to more than 60 inches.

Most areas of this soil are in woodland.

This soil is poorly suited to cultivated crops. The soil is somewhat droughty during the growing season, because of the rapid surface runoff, and crop response to lime and fertilizer is somewhat limited by this lack of moisture. The high acidity and high content of aluminum are major limitations for this soil. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, Virginia pine, yellow-poplar, and upland oaks do well on this soil. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits safe operation of heavy equipment.

The slope and clayey subsoil are the main limitations for nonfarm uses. Slope limits use of this soil as sites for buildings, septic tank absorption fields, and recreational areas. Slope and the clayey subsoil limit sanitary landfills. When wet, the clayey subsoil limits vehicular traffic. The low strength and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass IVe.

**63B—Orange silt loam, 2 to 7 percent slopes.** This deep, gently sloping, somewhat poorly drained to moderately well drained soil is on broad, weakly convex ridgetops. Areas of this soil are elongated, irregularly rectangular, or irregularly oval. They range from 3 to about 20 acres.

Typically, the surface layer of this soil is dark yellowish brown silt loam about 9 inches thick. The subsoil, to a depth of 33 inches, is mostly yellowish brown silty clay and clay mottled with gray. The substratum is multicolored brown, gray, and yellow loam to a depth of 55 inches. Bedrock is at a depth of 55 inches.

Included with this soil in mapping are small areas of well drained Fluvanna, Myersville, and Nason soils. These soils are mostly on high positions throughout the mapped area. Also included are small severely eroded areas of soils that have a yellowish brown silty clay loam or clay surface layer, small areas of soils that have a gravelly surface layer, and areas of soils that have slopes of 7 to 10 percent. Included soils make up about 20 percent of mapped areas.

Permeability is slow, and available water capacity is moderate. The surface runoff is medium, and the hazard of erosion is moderate. This soil has good tilth. The surface layer is friable and easily tilled. The subsoil has high shrink-swell potential. The root zone extends to a depth of 40 inches or more but is somewhat limited by the clayey subsoil. The organic matter content is low to moderate, and the natural fertility is high. This soil commonly is medium acid to moderately alkaline, but reaction in the surface layer is variable because of local liming. A seasonal high water table is at a depth of 1 foot to 3 feet during winter and spring. Bedrock is generally at a depth of more than 40 inches.

Most areas of this soil are used for hay or pasture. Some areas are in woodland.

This soil is moderately well suited to cultivated crops. Alfalfa is short lived because of seasonal wetness. Crop response to lime and fertilizer is somewhat limited. Conservation tillage, use of cover crops, including

grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderate. Loblolly pine, Virginia pine, and oaks do moderately well. Seeds and seedlings survive and grow well if competing vegetation is controlled.

Shallow depth to the seasonal high water table, high shrink-swell potential, low strength, slope, and the clayey, slowly permeable subsoil are the main limitations for nonfarm uses. The seasonal high water table limits use of this soil as a site for sanitary landfills. Low strength and shrink-swell potential limit building sites, and the clayey subsoil limits excavations. When wet, the clayey subsoil limits vehicular traffic. The slowly permeable subsoil limits the use of the soil for septic tank absorption fields. Slope limits use of this soil for playgrounds. The low strength and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass IIIe.

**64B—Orange very stony silt loam, 2 to 7 percent slopes.** This deep, gently sloping, somewhat poorly drained to moderately well drained soil is on weakly convex ridgetops and side slopes. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Areas of this soil are elongated and irregular in shape. They range from 3 to about 20 acres.

Typically, the surface layer of this soil is dark yellowish brown silt loam about 9 inches thick. The subsoil, to a depth of 33 inches, is mostly yellowish brown silty clay and clay mottled with gray. The substratum is multicolored brown, gray, and yellow loam to a depth of 55 inches. Bedrock is at a depth of 55 inches.

Included with this soil in mapping are small areas of well drained Catoctin, Fluvanna, and Myersville soils. The Fluvanna and Myersville soils are on the higher positions. The Catoctin soils are along the breaks to steeper positions and around outcrops of rock. Also included are small areas of severely eroded soils that have a yellowish brown clay loam or clay surface layer, of soils that have a gravelly surface layer, and of soils that have slopes of 7 to 10 percent. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability is slow, and available water capacity is moderate. Surface runoff is medium, and the hazard of erosion is moderate. The subsoil has high shrink-swell potential. The root zone extends to a depth of 40 inches

or more but is somewhat limited by the clayey subsoil. The organic matter content is low to moderate, and the natural fertility is high. This soil commonly is medium acid to moderately alkaline, but reaction in the surface is variable because of local liming. A seasonal high water table is at a depth of 1 foot to 3 feet during winter and spring. Bedrock is generally at a depth of more than 40 inches.

Most areas of this soil are in woodland. Some areas are used for hay or pasture.

This soil is not suited to hay and cultivated crops because large stones on the surface make use of modern equipment impractical.

This soil is moderately well suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderate. Loblolly pine, Virginia pine, yellow-poplar, and oaks do moderately well. Seeds and seedlings survive and grow well if competing vegetation is controlled.

Shallow depth to the seasonal high water table, high shrink-swell potential, low strength, slope, stoniness, and the clayey, slowly permeable subsoil are the main limitations for nonfarm uses. The seasonal high water table limits use of this soil as a site for sanitary landfills. Low strength, slope, and the shrink-swell potential limit building sites, and the clayey subsoil limits excavations. When wet, the clayey subsoil limits vehicular traffic. The slowly permeable subsoil and slope limit septic tank absorption fields. Slope and stoniness limit use of this soil for playgrounds. The low strength and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass Vls.

#### **65B—Pacolet sandy loam, 2 to 7 percent slopes.**

This deep, gently sloping, well drained soil is on narrow to broad, convex ridgetops. Areas of the soil commonly are irregularly rounded or oblong. They range from 3 to about 15 acres.

Typically, the surface layer of this soil is brown sandy loam about 6 inches thick. The subsoil is yellowish red and red clay loam and clay about 26 inches thick. The substratum to a depth of 60 inches or more is multicolored red, yellowish red, and strong brown sandy clay loam derived from strongly weathered granite.

Included with this soil in mapping are small areas of well drained to excessively drained Louisburg soils and well drained Wedowee soils. The Louisburg soils are on the more sloping positions. The Wedowee soils are on the least sloping landscape positions. Also included are areas of soils in which bedrock is at a depth of 24 inches and small areas of severely eroded soils that have a red sandy clay loam or clay loam surface layer.

Included soils make up about 20 percent of mapped areas.

Permeability is moderate, and available water capacity is low. Surface runoff is medium. The hazard of erosion is moderate. This soil has good tilth. The surface layer is friable and easily tilled when moist. The subsoil has low shrink-swell potential. The root zone extends to a depth of 30 inches or more. The organic matter content and natural fertility are low. This soil commonly is medium acid to very strongly acid, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 4 feet.

Most areas of this soil are farmed. Some areas are in woodland, and a few areas are in urban development.

This soil is well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, rotation of pasture, deferred grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high, especially for loblolly pine, Virginia pine, yellow-poplar, and oaks. Seeds and seedlings survive and grow well if competing vegetation is controlled.

The low strength and the moderately permeable, clayey subsoil are the main limitations for nonfarm uses. The low strength limits use of this soil as a building site, and the clayey subsoil limits excavations. The moderate permeability limits septic tank absorption fields. The low strength and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass Ilc.

#### **65C—Pacolet sandy loam, 7 to 15 percent slopes.**

This deep, strongly sloping, well drained soil is on narrow, convex ridgetops, and convex side slopes. Areas of this soil commonly are irregularly oblong. They range from 3 to about 15 acres.

Typically, the surface layer of this soil is brown sandy loam about 6 inches thick. The subsoil is yellowish red and red clay loam and clay about 26 inches thick. The substratum to a depth of 60 inches or more is multicolored red, yellowish red, and strong brown sandy clay loam derived from strongly weathered granite.

Included with this soil in mapping are small areas of well drained to excessively drained Louisburg soils and well drained Wedowee soils. The Louisburg soils are on the more sloping positions. The Wedowee soils are scattered throughout the mapped area. Also included are

areas in which bedrock is at a depth of 24 inches and small areas of severely eroded soils that have a red sandy clay loam or clay loam surface layer. Included soils make up about 20 percent of mapped areas.

Permeability is moderate, and available water capacity is low. Surface runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The surface layer is friable and easily tilled when moist. The subsoil has low shrink-swell potential. The root zone extends to a depth of 30 inches or more. The organic matter content and the natural fertility are low. This soil commonly is medium acid to very strongly acid, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 4 feet.

Most areas of this soil are in permanent pasture. Some areas are in woodland, and a few areas are in urban development.

This soil is moderately well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high, especially for loblolly pine, Virginia pine, yellow-poplar, and oaks. Seeds and seedlings survive and grow well if competing vegetation is controlled.

Slope, low strength, and moderately permeable, clayey subsoil are the main limitations for nonfarm uses. Slope and the low strength limit use of this soil as a building site, and the clayey subsoil limits excavations. Slope and moderate permeability are limitations for septic tank absorption fields. Slope is a limitation for recreational development. The low strength and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass IIIe.

**66C—Parker very stony loam, 7 to 15 percent slopes.** This deep, strongly sloping, excessively drained soil is on convex ridgetops. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Slopes are smooth and about 300 to 500 feet long. Areas of this soil are along the ridges and are irregularly shaped. They range from 5 to about 20 acres.

Typically, the surface layer is dark brown and brownish yellow very stony loam 14 inches thick. The subsoil about 24 inches thick is mostly dark yellowish brown extremely cobbly loam. The substratum to a depth of 67

inches is yellowish brown very stony sandy loam. Hard granite gneiss is at a depth of 67 inches.

Included with this soil in mapping are small intermingled areas, generally less than 2 acres, of well drained Chester and Porters soils. The Chester soils are throughout the mapped area. The Porters soils generally are on the north- and west-facing slopes. Also included are small areas of soils that have an extremely stony surface layer, of soils that have slopes of less than 7 percent, and of outcrops of rock. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability is moderately rapid, and available water capacity is low. Runoff is rapid. The hazard of erosion is severe. The organic matter content is moderate, and the natural fertility is low. The subsoil has low shrink-swell potential. The root zone extends to a depth of more than 30 inches. The surface layer and subsoil are very strongly acid or strongly acid, unless limed. Bedrock is generally at a depth of more than 4 feet.

Most areas of this soil are in woodland. A few areas are in pasture.

This soil is not suited to hay and cultivated crops. The stones on the surface make the use of modern equipment impractical.

This soil is moderately well suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes and overgrazing are major management concerns. Proper stocking rates to maintain desirable grasses and legumes, controlled grazing, and use of lime and fertilizer according to soil tests are useful in pasture management. If the pasture is overgrazed, runoff is increased and soil losses by erosion are excessive.

Potential productivity for trees on this soil is moderately high. The soil is managed for mixed hardwoods and pines. The survival of seeds and seedlings is affected by droughtiness during the growing season.

Depth to bedrock, stoniness, and slope are the main limitations for nonfarm uses. These are limitations for sanitary facilities, building sites, and recreational areas. This soil is fair as a source of roadfill.

This soil is in capability subclass VIe.

**66D—Parker very stony loam, 15 to 25 percent slopes.** This deep, moderately steep, excessively drained soil is on side slopes of mountains. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Slopes are smooth and about 400 to 1,000 feet long. Areas of this soil are wide and winding. They range from 10 to about 60 acres.

Typically, the surface layer is dark brown and brownish yellow very stony loam about 14 inches thick. The subsoil is mostly dark yellowish brown extremely cobbly loam about 24 inches thick. The substratum to a depth of 67 inches is yellowish brown very stony sandy loam. Hard granite gneiss is at a depth of 67 inches.

Included with this soil in mapping are small intermingled areas, generally less than 2 acres, of well drained Chester and Porters soils. The Chester soils are throughout the mapped area. The Porters soils generally are on the north- and west-facing slopes. Also included are small areas of soils that have an extremely stony surface layer and small areas of outcrops of rock. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability is moderately rapid, and available water capacity is low. Runoff is rapid. The hazard of erosion is severe. The natural fertility is low, and the organic matter content is moderate. The subsoil has low shrink-swell potential. The root zone extends to a depth of more than 30 inches. The surface layer and subsoil are very strongly acid or strongly acid, unless limed. Bedrock is generally at a depth of more than 4 feet.

Most areas of this soil are in woodland. A few areas are in pasture.

This soil is not suited to hay and cultivated crops. The stones on the surface make the use of tillage equipment impractical.

This soil is moderately well suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes and overgrazing are major management concerns. Proper stocking rates to maintain desirable grasses and legumes, rotation of pasture, controlled grazing, and the use of lime and fertilizer according to soil tests are useful in pasture management. If the pasture is overgrazed, runoff and soil losses by erosion are excessive.

Potential productivity for trees on this soil is moderately high. The soil is managed for mixed hardwoods and pines. The survival of seeds and seedlings is affected by droughtiness during the growing season. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and to help control erosion. The slope limits safe operation of heavy equipment.

Slope, stoniness, and depth to bedrock are the main limitations for nonfarm uses. These are limitations for sanitary facilities, building sites, and recreational areas. The soil is fair as a source of roadfill.

This soil is in capability subclass VIs.

**66E—Parker very stony loam, 25 to 45 percent slopes.** This deep, steep, excessively drained soil is on side slopes of mountains. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Slopes are smooth and about 400 to 1,000 feet long. Areas of this soil are wide and winding. They range from 10 to about 60 acres.

Typically, the surface layer is dark brown and brownish yellow very stony loam about 14 inches thick. The subsoil is mostly dark yellowish brown extremely cobbly loam about 24 inches thick. The substratum to a depth of 67 inches is yellowish brown very stony sandy loam. Hard granite gneiss is at a depth of 67 inches.

Included with this soil in mapping are small intermingled areas, generally less than 2 acres, of well drained Chester and Porters soils. The Chester soils are throughout the mapped area. The Porters soils generally are on the north- and west-facing slopes. Also included are small areas of soils that have an extremely stony surface layer and small areas of outcrops of rock. The included soils and outcrops make up about 25 percent of mapped areas.

Permeability is moderately rapid, and available water capacity is low. Runoff is very rapid. The hazard of erosion is very severe. The natural fertility is low, and the organic matter content is moderate. The subsoil has low shrink-swell potential. The root zone extends to a depth of more than 30 inches. The surface layer and subsoil are very strongly acid or strongly acid, unless limed. Bedrock is generally at a depth of more than 4 feet.

Most areas of this soil are in woodland. A few areas are in pasture.

This soil is not suited to hay and cultivated crops. The stones on the surface and steep slopes make the use of tillage equipment impractical.

This soil is poorly suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes and overgrazing are major management concerns. Proper stocking rates to maintain desirable grasses and legumes, controlled grazing, and use of lime and fertilizer according to soil tests are useful in pasture management. If the pasture is overgrazed, runoff and soil losses by erosion are excessive.

Potential productivity for trees on this soil is moderately high. The soil is managed for mixed hardwoods and pines. The survival of seeds and seedlings is affected by droughtiness during the growing season. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and to help control erosion. The slope limits safe operation of heavy equipment.

Slope, stoniness, and depth to bedrock are the main limitations for nonfarm uses. These are limitations for sanitary facilities, building sites, and recreational areas. The soil is poor as a source of roadfill.

This soil is in capability subclass VIIs.

**67D—Parker extremely stony loam, 15 to 25 percent slopes.** This deep, moderately steep, excessively drained soil is on side slopes of mountains and narrow ridgetops. Stones, 1/2 foot to 3 feet apart, cover 15 to 50 percent of the surface. Slopes are smooth and about 400 to 1,000 feet long. Areas of this soil are wide and winding. They range from 10 to about 60 acres.

Typically, the surface layer is dark brown and brownish yellow very stony loam about 14 inches thick. The subsoil is mostly dark yellowish brown extremely cobbly loam about 24 inches thick. The substratum to a depth

of 67 inches is yellowish brown very stony sandy loam. Hard granite gneiss is at a depth of 67 inches.

Included with this soil in mapping are small intermingled areas, generally less than 2 acres, of well drained Chester and Porters soils. The Chester soils are throughout the mapped area. The Porters soils generally are on north- and west-facing slopes. Also included are small areas of soils that have a very stony surface layer, of soils that have slopes of more than 25 percent, and of outcrops of rock. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability is moderately rapid, and available water capacity is low. Runoff is rapid. The hazard of erosion is severe. The natural fertility is low, and the organic matter content is moderate. The subsoil has low shrink-swell potential. The root zone extends to a depth of more than 30 inches. The surface layer and subsoil are very strongly acid or strongly acid, unless limed. Bedrock is generally at a depth of more than 4 feet.

Most areas of this soil are in woodland. A few areas are in pasture.

This soil is not suited to hay and cultivated crops. The stones on the surface make the use of modern equipment impractical.

This soil is poorly suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes and overgrazing are major management concerns. Proper stocking rates to maintain desirable grasses and legumes, rotation of pasture, deferment of grazing, and use of lime and fertilizer according to soil tests are useful in pasture management. If the pasture is overgrazed, runoff and soil losses by erosion are excessive.

Potential productivity for trees on this soil is moderately high. The soil is managed for mixed hardwoods and pines. The survival of seeds and seedlings is affected by droughtiness during the growing season. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and to help control erosion. The slope limits safe operation of heavy equipment.

Slope, stoniness, and depth to bedrock are the main limitations for nonfarm uses. These are limitations for sanitary facilities, building sites, and recreational areas. The soil is fair as a source of roadfill.

This soil is in capability subclass VII<sub>s</sub>.

**67E—Parker extremely stony loam, 25 to 60 percent slopes.** This deep, steep to very steep, excessively drained soil is on side slopes of mountains and bluffs. Stones, 1/2 foot to 3 feet apart, cover 15 to 50 percent of the surface. Slopes are smooth and about 400 to 1,000 feet long. Areas of this soil are wide and are along the ridges. They range from 10 to about 60 acres.

Typically, the surface layer is dark brown and brownish yellow very stony loam about 14 inches thick. The subsoil is mostly dark yellowish brown extremely cobbly

loam about 24 inches thick. The substratum to a depth of 67 inches is yellowish brown very stony sandy loam. Hard granite gneiss is at a depth of 67 inches.

Included with this soil in mapping are small intermingled areas, generally less than 2 acres, of well drained Chester and Porters soils. The Chester soils are on the less sloping positions. The Porters soils generally are on the north- and west-facing, less sloping positions. Also included are small areas of soils that have a very stony surface layer and small areas of outcrops of rock. The included soils and outcrops make up about 25 percent of mapped areas.

Most areas of this soil are in woodland. A few small areas are in pasture.

This soil is not suited to hay and cultivated crops. The steep slope and stones on the surface make the use of tillage equipment impractical.

This soil is poorly suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes and overgrazing are major management concerns. Proper stocking rates to maintain desirable grasses and legumes, controlled grazing, and use of lime and fertilizer according to soil tests are useful in pasture management. If the pasture is overgrazed, runoff and soil losses by erosion are excessive.

Potential productivity for trees on this soil is moderately high. The soil is managed for mixed hardwoods and pines. The survival of seeds and seedlings is affected by droughtiness during the growing season. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits safe operation of heavy equipment.

Slope, stoniness, and depth to bedrock are the main limitations for nonfarm uses. These are limitations for sanitary facilities, building sites, and recreational areas. The soil is poor as a source of roadfill.

This soil is in capability subclass VII<sub>s</sub>.

**68B—Penn silt loam, 2 to 7 percent slopes.** This moderately deep, gently sloping, well drained soil is on convex ridgetops. Slopes are smooth and 100 to 500 feet long. Areas of this soil commonly are irregularly rounded or elongated. They range from 3 to about 20 acres.

Typically, the surface layer of this soil is reddish brown silt loam about 7 inches thick. The subsoil is red silty clay loam and shaly silty clay loam about 14 inches thick. The substratum to a depth of 29 inches is red extremely shaly silty clay loam. Rippable shale bedrock is at a depth of 29 inches.

Included with this soil in mapping are small areas of moderately well drained to well drained Manassas soils and well drained Klinessville and Totier soils. The Manassas soils are in depressions and along small drainageways. The Klinessville and Totier soils are throughout the mapped area. Also included are small

areas of soils that have a shaly surface layer and of severely eroded soils in which the surface layer is red silty clay loam. Included soils make up about 20 percent of mapped areas.

Permeability is moderate to moderately rapid, and available water capacity is low. Surface runoff is medium. The hazard of erosion is moderate. This soil has good tilth. The surface layer is friable and easily tilled. The subsoil has low shrink-swell potential. The root zone is restricted to a depth of less than 40 inches by bedrock. The organic matter content is low, and the natural fertility is medium. This soil commonly is slightly acid to strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of less than 40 inches.

Most areas of this soil are in pasture or hayland. Some areas are in cropland.

This soil is well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Alfalfa commonly is short lived because of the shallow rooting depth. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil.

The depth to bedrock, potential frost action, and seepage are the main limitations for nonfarm uses. The depth to bedrock limits use of this soil as a building site. Seepage and the depth to bedrock are limitations for most sanitary facilities. The depth to bedrock and excess fines limit use of the soil as a source of roadfill. Slope is a limitation for playgrounds. The soil is good for use as openland wildlife habitat and fair for use as woodland wildlife habitat.

This soil is in capability subclass IIe.

**68C—Penn silt loam, 7 to 15 percent slopes.** This moderately deep, strongly sloping, well drained soil is on convex side slopes and the points of ridges. Slopes are smooth and 400 to 600 feet long. Areas of this soil commonly are long and winding. They range from 5 to about 25 acres.

Typically, the surface layer of this soil is reddish brown silt loam about 7 inches thick. The subsoil is red silty clay loam and shaly silty clay loam about 14 inches

thick. The substratum to a depth of 29 inches is red extremely shaly silty clay loam. Rippable shale bedrock is at a depth of 29 inches.

Included with this soil in mapping are small areas of moderately well drained to well drained Manassas soils and well drained Klinesville and Totier soils. The Manassas soils are in depressions and along small drainageways. The Klinesville and Totier soils are throughout the mapped area. Also included are small areas of soils that have a shaly surface layer and of severely eroded soils that have a surface layer of red silty clay loam. Included soils make up about 20 percent of mapped areas.

Permeability is moderate to moderately rapid, and available water capacity is low. Surface runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The surface layer is friable and easily tilled. The subsoil has low shrink-swell potential. The root zone is restricted to a depth of less than 40 inches by bedrock. The organic matter content is low, and the natural fertility is medium. This soil commonly is slightly acid to very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of less than 40 inches.

Most areas of this soil are in pasture or hayland. Some areas are in cropland or woodland.

This soil is moderately well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Alfalfa commonly is short lived because of the shallow rooting depth. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, rotation of pasture, deferred grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil.

The slope, depth to bedrock, potential frost action, and seepage are the main limitations for nonfarm uses. The depth to bedrock limits use of this soil as a building site. The slope, seepage, and depth to bedrock limit most sanitary facilities. The depth to bedrock and excess fines limit use of the soil as a source of roadfill. Slope is a limitation for recreational development. The soil is good for use as openland wildlife habitat and fair for use as woodland wildlife habitat.

This soil is in capability subclass IIIe.

**68D—Penn silt loam, 15 to 25 percent slopes.** This moderately deep, moderately steep, well drained soil is on convex side slopes. Slopes are smooth and 100 to 400 feet long. Areas of this soil commonly are long and winding. They range from 3 to about 25 acres.

Typically, the surface layer of this soil is reddish brown silt loam, about 7 inches thick. The subsoil is red silty clay loam and shaly silty clay loam about 14 inches thick. The substratum to a depth of 29 inches is red extremely shaly silty clay loam. Rippable shale bedrock is at a depth of 29 inches.

Included with this soil in mapping are small areas of well drained Klinesville and Totier soils. These soils are throughout the mapped area. Also included are small areas of severely eroded soils that have a surface layer of red silty clay loam. Included soils make up about 20 percent of mapped areas.

Permeability is moderate to moderately rapid, and available water capacity is low. Surface runoff is rapid. The hazard of erosion is severe. The surface layer is friable and easily tilled. The subsoil has low shrink-swell potential. The root zone is restricted to a depth of less than 40 inches by bedrock. The organic matter content is low, and the natural fertility is medium. This soil commonly is slightly acid to very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of less than 40 inches.

Most areas of this soil are in pasture and hayland. Some areas are in woodland.

This soil is poorly suited to cultivated crops. The hazard of erosion is a major management concern. When lime and fertilizer are applied according to soil tests, crops respond well. Alfalfa commonly is short lived because of the shallow rooting depth. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and till and help to control erosion, reduce crusting, and increase water infiltration.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil.

Slope, depth to bedrock, and seepage are the main limitations for nonfarm uses. The slope limits use of this soil as a building site. Slope, seepage, and depth to bedrock limit use of the soil for most sanitary facilities. The slope, depth to bedrock, and excess fines limit use of the soil as a source of roadfill. Slope is a limitation for

recreational development. The soil is good for openland and woodland wildlife habitats.

This soil is in capability subclass IVe.

**69—Pits, quarry.** This map unit consists of open excavations from which granite, greenstone, or soapstone is mined. The quarries commonly are 50 to more than 300 feet deep. The sides are generally steep, and the floor is relatively level. The shape of the quarries can be irregular or almost square depending on the nature of the rock and ownership boundaries. The quarries range from 2 to about 60 acres.

Included in mapping are pools of water and spoil piles in and around some of the quarries. These inclusions make up less than 15 percent of mapped areas.

The quarries are not suited to farming or urban uses and are limited for recreational uses.

When abandoned, parts of the quarries become overgrown with vegetation. If abandoned quarries are used as a dump, the hazard of ground water contamination is very severe. Some quarries hold water and are suitable as recreational areas.

This map unit is not assigned to a capability subclass.

**70C—Porters very stony loam, 7 to 15 percent slopes.** This deep, sloping to strongly sloping, well drained soil is on convex ridgetops. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Slopes are smooth and about 200 to 500 feet long. Areas of this soil are along the ridges and are irregular in shape. They range from 5 to 20 acres.

Typically, the surface layer is black cobbly loam 8 inches thick. The subsoil is mostly brown and dark yellowish brown loam about 24 inches thick. The substratum to a depth of 59 inches is brownish yellow sandy loam. Hard granodiorite is at a depth of 59 inches.

Included with this soil in mapping are small intermingled areas, generally less than 2 acres, of somewhat excessively drained Ashe soils, well drained Chester soils, and excessively drained Parker soils. The Chester soils are throughout the mapped area. The Ashe and Parker soils generally are near the breaks to the steeper positions and are near outcrops of rock. Also included are small areas of soils that do not have stones on the surface, small areas of soils that have slopes of less than 7 percent, and small areas of outcrops of rock. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Runoff is rapid. The hazard of erosion is severe. The organic matter content is moderate to high, and the natural fertility is medium. The subsoil has low shrink-swell potential. The root zone extends to a depth of more than 30 inches. The surface layer and subsoil are very strongly acid or strongly acid, unless limed. Bedrock is generally at a depth of more than 40 inches.

Most areas of this soil are in woodland. A few areas are in pasture.

This soil is not suited to hay and cultivated crops. The stones on the surface make the use of modern equipment impractical.

This soil is moderately well suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes and overgrazing are major management concerns. Proper stocking rates to maintain desirable grasses and legumes, controlled grazing, and the use of lime and fertilizer according to soil tests are useful in pasture management. If the pasture is overgrazed, runoff is increased and soil losses by erosion are excessive.

Potential productivity for trees on this soil is high. The soil is managed for mixed hardwoods and pines. Thinning stands for rapid growth, clear cutting, replanting with fast growing species, and removal of insect- or disease-infected trees help increase timber production.

The depth to bedrock, stoniness, and slope are the main limitations for nonfarm uses. These are limitations for sanitary facilities, building sites, and recreational areas. The soil is limited for use as a source of roadfill because of the depth to rock and excess fines.

This soil is in capability subclass VIs.

**70D—Porters very stony loam, 15 to 25 percent slopes.** This deep, moderately steep, well drained soil is on side slopes of mountains. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Slopes are smooth and about 300 to 600 feet long. Areas of this soil are wide and winding. They range from 10 to about 20 acres.

Typically, the surface layer is black cobbly loam about 8 inches thick. The subsoil is mostly brown and dark yellowish brown loam about 24 inches thick. The substratum to a depth of 59 inches is brownish yellow sandy loam. Hard granodiorite is at a depth of 59 inches.

Included with this soil in mapping are small intermingled areas, generally less than 2 acres, of somewhat excessively drained Ashe soils, well drained Chester soils, and excessively drained Parker soils. The Chester soils are throughout the mapped area. The Ashe and Parker soils generally are near the breaks to steeper positions and around outcrops of rock. Also included are small areas of soils that do not have stones on the surface and small areas of outcrops of rock. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Runoff is rapid. The hazard of erosion is severe. The natural fertility is medium, and the organic matter content is high. The subsoil has low shrink-swell potential. The root zone extends to a depth of more than 30 inches. The surface layer and subsoil are very strongly acid or strongly acid, unless limed. Bedrock is generally at a depth of more than 40 inches.

Most areas of this soil are in woodland. A few areas are in pasture.

This soil is not suited to hay and cultivated crops. The stones on the surface make the use of modern equipment impractical.

This soil is moderately well suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes and overgrazing are major management concerns. Proper stocking rates to maintain desirable grasses and legumes, controlled grazing, and the use of lime and fertilizer according to soil tests are useful in pasture management. If the pasture is overgrazed, runoff and soil losses by erosion are excessive.

Potential productivity for trees on this soil is high. The soil is managed for mixed hardwoods and pines. Thinning stands for rapid growth, clear cutting, replanting with fast-growing species, and removal of insect- or disease-infected trees help increase timber production. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion.

Slope, stoniness, and depth to bedrock are the main limitations for nonfarm uses. These are limitations for sanitary facilities, building sites, and recreational areas. The soil is limited for use as a source of roadfill because of the depth to rock, the excess fines, and the slope.

This soil is in capability subclass VIs.

**70E—Porters very stony loam, 25 to 45 percent slopes.** This deep, steep, well drained soil is on side slopes of mountains. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Slopes are smooth and about 300 to 600 feet long. Areas of this soil are wide and winding. They range from 10 to about 60 acres.

Typically, the surface layer is black cobbly loam about 8 inches thick. The subsoil is mostly brown and dark yellowish brown loam about 24 inches thick. The substratum to a depth of 59 inches is brownish yellow sandy loam. Hard granodiorite is at a depth of 59 inches.

Included with this soil in mapping are small intermingled areas, generally less than 2 acres, of somewhat excessively drained Ashe soils, well drained Chester soils, and excessively drained Parker soils. The Chester soils are throughout the mapped area. The Ashe and Parker soils generally are on the steeper positions and around outcrops of rock. Also included are small areas of soils that do not have stones on the surface and small areas of outcrops of rock. The included soils and outcrops make up about 25 percent of mapped areas.

Permeability and available water capacity are moderate. Runoff is very rapid. The hazard of erosion is very severe. The natural fertility is medium, and the organic matter content is moderate to high. The subsoil has low shrink-swell potential. The root zone extends to a depth of more than 30 inches. The surface layer and subsoil are very strongly acid or strongly acid, unless limed. Bedrock is generally at a depth of more than 40 inches.

Most areas of this soil are in woodland. A few areas are in pasture.

This soil is not suited to hay and cultivated crops. The stones on the surface and the steep slope make the use of tillage equipment impractical.

This soil is poorly suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes and overgrazing are major management concerns. Proper stocking rates to maintain desirable grasses and legumes, controlled grazing, and use of lime and fertilizer according to soil tests are useful in pasture management. If the pasture is overgrazed, runoff and soil losses by erosion are excessive.

Potential productivity for trees on this soil is high. The soil is managed for mixed hardwoods and pines. Thinning stands for rapid growth, clear cutting, replanting with fast-growing species, and removal of insect- or disease-infected trees help increase production. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits safe operation of heavy equipment.

Slope, stoniness, and depth to bedrock are the main limitations for nonfarm uses. These are limitations for sanitary facilities, building sites, and recreational areas. The soil is limited for use as a source of roadfill because of the steep slope and excess fines.

This soil is in capability subclass VIIe.

**71B—Rabun clay loam, 2 to 7 percent slopes.** This deep, gently sloping, well drained soil is on narrow to broad convex ridgetops. Areas of this soil commonly are irregularly rounded or oblong. They range from 5 to about 30 acres.

Typically, the surface layer of this soil is dark reddish brown clay loam about 6 inches thick. The subsoil is mostly dark red clay about 42 inches thick. The substratum is mostly red silty clay loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Catoctin, Davidson, and Myersville soils. The Catoctin soils are on the more sloping positions, around outcrops of rock, and near the breaks to steeper slopes. The Davidson and Myersville soils are throughout the mapped area. Also included are small areas of severely eroded soils that have a surface layer of dark red clay and of soils that have stones on the surface. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is medium. The hazard of erosion is moderate. This soil has good tilth. The surface layer is friable and easily tilled when moist, but it breaks up into clods if the soil is tilled when too wet or too dry. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content is moderate, and the natural fertility is

medium. This soil commonly is slightly acid to strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 60 inches.

Most areas of this soil are farmed. Some areas are in woodland.

This soil is well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, eastern white pine, yellow-poplar, and oaks do well on this soil.

The low strength of the soil and the clayey texture of the subsoil are the main limitations for nonfarm uses. The low strength limits use of this soil for local roads and streets, and the clayey subsoil limits excavations. The clayey subsoil limits sanitary landfills. Slope is a limitation for playgrounds. The low strength and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass IIe.

**71C—Rabun clay loam, 7 to 15 percent slopes.** This deep, strongly sloping, well drained soil is on narrow convex ridgetops and on convex side slopes. Areas of this soil commonly are long and winding. They range from 5 to about 25 acres.

Typically, the surface layer of this soil is dark reddish brown clay loam about 6 inches thick. The subsoil is mostly dark red clay about 42 inches thick. The substratum to a depth of 60 inches or more is mostly red silty clay loam.

Included with this soil in mapping are small areas of well drained Catoctin, Davidson, and Myersville soils. The Catoctin soils are on the more sloping positions, near the breaks to steeper slopes, and around outcrops of rock. The Davidson and Myersville soils are throughout the mapped area. Also included are small areas of severely eroded soils that have a dark red clay surface layer and small areas that have stones on the surface. The included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The surface layer is friable and easily tilled when moist, but it breaks up into

clods if the soil is tilled when too wet or too dry. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content is moderate, and the natural fertility is medium. This soil commonly is slightly acid to strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 60 inches.

Most areas of this soil are farmed. A few areas are in woodland.

This soil is moderately well suited to cultivated crops. The severe hazard of erosion is a major management concern. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high, especially for loblolly pine, eastern white pine, yellow-poplar, and oaks. Seeds and seedlings survive and grow well if competing vegetation is controlled.

Slope, low strength, and clayey subsoil are the main limitations for nonfarm uses. Slope and the low strength limit the use of this soil for local roads and streets. Slope and the clayey subsoil limit excavations. Slope and the clayey subsoil limit use of the soil for sanitary landfills. Slope is a limitation for recreational development. The low strength and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass IIIe.

#### **71D—Rabun clay loam, 15 to 25 percent slopes.**

This deep, moderately steep, well drained soil is on convex side slopes. Slopes commonly are simple and 400 to 800 feet long. Areas of this soil are elongated or long and winding. They range from 5 to about 15 acres.

Typically, the surface layer of this soil is dark reddish brown clay loam about 6 inches thick. The subsoil is mostly dark red clay about 42 inches thick. The substratum to a depth of 60 inches or more is red silty clay loam.

Included with this soil in mapping are small areas of well drained Catocin, Myersville, and Starr soils. The Catocin soils are mainly on the more sloping positions near the breaks to steeper slopes and around outcrops of rock. The Myersville soils are throughout the mapped area. The Starr soils are on foot slopes and along small drainageways. Also included are small areas of severely

eroded soils that have a dark red clay surface layer, small areas of gullied soils, small areas that have stones on the surface, and small areas of outcrops of rock mainly on the lower part of slopes. The included soils and outcrops make up about 25 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The surface layer is moderately friable and easily tilled when moist, but it breaks up into clods if the soil is tilled when too wet or too dry. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content is moderate, and the natural fertility is medium. This soil is slightly acid to strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 60 inches.

Most areas of this soil are in woodland or permanent pasture.

This soil is poorly suited to cultivated crops. The severe hazard of erosion is a major management concern. The soil is somewhat droughty during the growing season, because of the rapid surface runoff, and crop response to lime and fertilizer is somewhat limited by the lack of moisture. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, eastern white pine, yellow-poplar, and oaks do well on this soil. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits safe operation of heavy equipment.

The slope and the clayey subsoil are the main limitations for nonfarm uses. Slope limits use of this soil as a building site, as a site for most sanitary facilities, and as a site for recreational areas. Slope and the clayey subsoil are limitations for sanitary landfills. The low strength and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass IVe.

**71E—Rabun clay loam, 25 to 45 percent slopes.**  
This deep, steep, well drained soil is on convex side

slopes. Slopes commonly are simple and are 400 to 800 feet long. Areas of this soil are elongated or long and winding. They range from 10 to about 25 acres.

Typically, the surface layer of this soil is dark reddish brown clay loam about 6 inches thick. The subsoil is mostly dark red clay about 42 inches thick. The substratum to a depth of 60 inches or more is red silty clay loam.

Included with this soil in mapping are small areas of well drained Catoctin, Myersville, and Starr soils. The Catoctin soils are mainly on the more sloping positions and around outcrops of rock. The Myersville soils are throughout the mapped area. The Starr soils are on foot slopes and along drainageways. Also included are small areas of severely eroded soils that have a dark red clay surface layer, small areas of gullied soils, small areas that have stones on the surface, and small areas of outcrops of rock mainly on the lower part of slopes. The included soils and outcrops make up about 25 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is very rapid. The hazard of erosion is very severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content is moderate, and the natural fertility is medium. This soil is slightly acid to strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 60 inches.

Most areas of this soil are in woodland or permanent pasture.

This soil is not suited to cultivated crops. The steep slope makes use of modern tillage equipment impractical. The severe hazard of erosion is a major management concern.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, rotation of pasture, deferred grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, eastern white pine, yellow-poplar, and oaks do well on this soil. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits safe operation of heavy equipment.

The slope is the main limitation for nonfarm uses. Slope limits use of this soil as a building site, as a site for most sanitary facilities, and as a site for recreational areas. The slope, low strength, and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass VIe.

**72B3—Rabun clay, 2 to 7 percent slopes, severely eroded.** This soil is deep, gently sloping, and well drained. It is on narrow to broad convex ridgetops. Areas of this soil are 200 to 500 feet wide and are elongated along the ridge and are highly variable in shape. They range from 5 to about 30 acres.

Typically, the surface layer of this soil is dark red clay about 4 inches thick. The subsoil is dark red clay about 36 inches thick. The substratum is red silty clay loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Davidson, Myersville, and Starr soils. The Davidson and Myersville soils commonly are intermingled on the same landscape positions. The Starr soils are in shallow depressions and along drainageways. Also included are small areas of Rabun soils on the steeper slopes. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is medium. The hazard of erosion is moderate. Tilth is poor, and the surface layer breaks up into clods if tilled when too wet. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content is low, and the natural fertility is medium. This soil is strongly acid to slightly acid, unless limed. Bedrock is generally at a depth of more than 60 inches.

Most areas of this soil are farmed. A few small areas are in permanent pasture or woodland.

This soil is moderately well suited to cultivated crops. The moderate hazard of erosion and the damage of past erosion are major management concerns. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, using cover crops and grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and control erosion. Increasing the organic matter content of this soil improves tilth, infiltration, and fertility and reduces crusting and improves soil-seed contact.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface layer, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is high, especially for yellow-poplar, oaks, loblolly pine, and eastern white pine. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, mowing, and girdling.

This soil is limited for most nonfarm uses. The clayey subsoil is a limitation for sanitary facilities and for

shallow excavations. This soil is fairly well suited to lawns, landscaping, and golf fairways. Low strength and excess fines limit the use of this soil as a source of roadfill. The clayey surface layer limits this soil for recreational development. Slope limits the use of this soil for playgrounds. The soil is good for use as openland and woodland wildlife habitats.

This soil is in capability subclass IIIe.

**72C3—Rabun clay, 7 to 15 percent slopes, severely eroded.** This soil is deep, strongly sloping, and well drained. It is on narrow convex ridgetops and convex side slopes. Areas of this soil are 100 to 300 feet wide and are elongated along the ridge and are highly variable in shape. They range from 5 to about 30 acres.

Typically, the surface layer of this soil is dark red clay about 4 inches thick. The subsoil is dark red clay about 36 inches thick. The substratum is red silty clay loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Catoctin, Davidson, Myersville, and Starr soils. The Catoctin soils are near the breaks to steeper slopes and around outcrops of rock. The Davidson and Myersville soils commonly are scattered throughout the mapped area. The Starr soils are in shallow depressions and along drainageways. Also included are small areas of Rabun soils on steeper slopes. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. Tilth is poor, and the surface layer breaks up into clods if tilled when too wet. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content is low, and the natural fertility is medium. This soil commonly is strongly acid to slightly acid, unless limed. Bedrock is generally at a depth of more than 60 inches.

Most areas of this soil are farmed. Some areas are in permanent pasture or woodland.

This soil is poorly suited to cultivated crops. The severe hazard of erosion and the damage of past erosion are major management concerns. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, using cover crops, grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and control erosion. Increasing the organic matter content of this soil improves tilth, infiltration, and fertility. It also reduces crusting and improves soil-seed contact.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of adapted grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil

is too wet causes compaction of the surface layer, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is high, especially for yellow-poplar, oaks, loblolly pine, and eastern white pine. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, mowing, and girdling.

This soil is limited for most nonfarm uses. The slope and clayey subsoil are limitations for sanitary facilities and excavations. Slope is a limitation for most building sites and for lawns, landscaping, and golf fairways. Low strength and excess fines limit the use of this soil as a source of roadfill. Slope limits recreational development. The soil is good for use as openland and woodland wildlife habitats.

This soil is in capability subclass IVe.

**72D3—Rabun clay, 15 to 25 percent slopes, severely eroded.** This soil is deep, moderately steep, and well drained. It is on side slopes. Areas of this soil are 100 to 300 feet wide and are along the drainage pattern. They range from 5 to about 30 acres.

Typically, the surface layer of this soil is dark red clay about 4 inches thick. The subsoil is dark red clay about 36 inches thick. The substratum is red silty clay loam to a depth of 60 inches.

Included with this soil in mapping are small areas of well drained Catoctin, Myersville, and Starr soils. The Catoctin soils are near the breaks to steeper slopes and around outcrops of rock. The Myersville soils commonly are scattered throughout the mapped area. The Starr soils are on foot slopes and along small drainageways. Also included are small areas of Rabun soils on the less steep slopes. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The erosion hazard is severe. Tilth is poor, and the surface layer breaks up into clods if tilled when too wet. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content is low, and the natural fertility is medium. This soil commonly is strongly acid to slightly acid, unless limed. Bedrock is generally at a depth of more than 60 inches.

Most areas of this soil are in permanent pasture or woodland.

This soil is not suited to cultivated crops because past erosion has removed all or nearly all of the original topsoil.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of adapted grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil

is too wet causes compaction of the surface layer, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is high, especially for yellow-poplar, loblolly pine, and western white pine. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, mowing, and girdling. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits safe operation of heavy equipment.

This soil is limited for most nonfarm uses because of the steep slope. The slope and clayey subsoil are limitations for sanitary facilities. Low strength and excess fines limit the use of this soil as a source of roadfill. Slope limits recreational development. This soil is good for use as woodland wildlife habitat.

This soil is in capability subclass VIe.

**72E3—Rabun clay, 25 to 45 percent slopes, severely eroded.** This soil is deep, steep, and well drained. It is on side slopes. Areas of this soil are 100 to 300 feet wide and are along the drainage pattern. They range from 5 to about 30 acres.

Typically, the surface layer of this soil is dark red clay about 4 inches thick. The subsoil is dark red clay about 36 inches thick. The substratum is red silty clay loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Catoctin, Myersville, and Starr soils. The Catoctin and Myersville soils commonly are intermingled on the same landscape positions. The Starr soils are on foot slopes and along small drainageways. Also included are small areas of Rabun soils on the less steep slopes. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is very rapid. The hazard of erosion is very severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content is low, and the natural fertility is medium. This soil commonly is strongly acid or medium acid, unless limed. Bedrock is generally at a depth of more than 60 inches.

Most areas of this soil are in permanent pasture or woodland.

This soil is not suited to hay and cultivated crops. Past erosion has removed all or nearly all of the original topsoil. The steep slope makes use of modern equipment impractical.

This soil is poorly suited to pasture crops. Establishing and maintaining a mixture of adapted grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes

compaction of the surface layer, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is high, especially for yellow-poplar, oaks, loblolly pine, and eastern white pine. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, mowing, and girdling. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits safe operation of heavy equipment.

This soil is limited for most nonfarm uses because of the steep slope. The slope is a limitation for sanitary facilities. Slope, low strength, and excess fines limit the use of this soil as a source of roadfill. Slope limits recreational development. The soil is good for use as woodland wildlife habitat.

This soil is in capability subclass VIIe.

**73C—Rabun very stony clay loam, 7 to 15 percent slopes.** This soil is deep, strongly sloping, and well drained. It is on narrow ridgetops and side slopes. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Areas of this soil are 200 to 300 feet wide and are along the drainage pattern. They range from 10 to about 30 acres.

Typically, the surface layer of this soil is dark reddish brown clay loam about 6 inches thick. The subsoil is dark red clay about 42 inches thick. The substratum is red silty clay loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Catoctin, Davidson, Myersville, and Starr soils. The Catoctin, Davidson, and Myersville soils commonly are intermingled on the same landscape positions. The Starr soils are on foot slopes and along small drainageways. Also included are small areas of Rabun soils on the less steep slopes and areas of soils that do not have stones on the surface. Included soils make up about 15 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content is moderate, and the natural fertility is medium. This soil commonly is strongly acid or medium acid, unless limed. Bedrock is generally at a depth of more than 60 inches.

Most areas of this soil are in permanent pasture or woodland.

This soil is not suited to hay and cultivated crops. The stones on the surface make the use of tillage equipment impractical.

This soil is moderately well suited to pasture crops. Establishing and maintaining a mixture of adapted grasses and legumes, use of proper stocking rates, rotation of pasture, deferred grazing, and use of lime and

fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface layer, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is high, especially for yellow-poplar, oaks, loblolly pine, and eastern white pine. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, mowing, and girdling.

This soil is limited for most nonfarm uses because of the steep slope. The slope and clayey subsoil are limitations for sanitary facilities. Low strength and excess fines limit the use of this soil as a source of roadfill. Slope limits the use of this soil for recreational development. The soil is good for use as woodland wildlife habitat.

This soil is in capability subclass VI<sub>s</sub>.

**73D—Rabun very stony clay loam, 15 to 25 percent slopes.** This soil is deep, moderately steep, and well drained. It is on side slopes. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Areas of this soil are 200 to 300 feet wide and are along the drainage pattern. They range from 10 to about 40 acres or more.

Typically, the surface layer of this soil is dark reddish brown clay loam about 6 inches thick. The subsoil is dark red clay about 42 inches thick. The substratum is red silty clay loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Catocin, Myersville, and Starr soils. The Catocin and Myersville soils commonly are intermingled on the same landscape positions. The Starr soils are on foot slopes and along small drainageways. Also included are small areas of Rabun soils on the less steep slopes and areas of soils that do not have stones on the surface. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content is low, and the natural fertility is medium. This soil commonly is strongly acid or medium acid, unless limed. Bedrock is generally at a depth of more than 60 inches.

Most areas of this soil are in permanent pasture or woodland.

This soil is not suited to hay and cultivated crops. The stones on the surface make the use of modern equipment impractical.

This soil is moderately well suited to pasture crops. Establishing and maintaining a mixture of adapted grasses and legumes, use of proper stocking rates, controlled or deferred grazing, and use of lime and fertilizer according to soil tests help increase the carrying

capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface layer, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is high, especially for yellow-poplar, oaks, loblolly pine, and eastern white pine. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, mowing, and girdling. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits safe operation of heavy equipment.

This soil is limited for most nonfarm uses because of the steep slope. The slope and clayey subsoil are limitations for sanitary facilities. Low strength and excess fines limit the use of this soil as a source of roadfill. Slope limits the use of this soil for recreational development. The soil is good for use as woodland wildlife habitat.

This soil is in capability subclass VI<sub>s</sub>.

**73E—Rabun very stony clay loam, 25 to 45 percent slopes.** This soil is deep, steep, and well drained. It is on side slopes. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Areas of this soil are 200 to 300 feet wide and are along the drainage pattern. They range from 10 to about 40 acres.

Typically, the surface layer of this soil is dark reddish brown clay loam about 6 inches thick. The subsoil is dark red clay about 42 inches thick. The substratum is red silty clay loam to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Catocin, Myersville, and Starr soils. The Catocin and Myersville soils commonly are intermingled on the same landscape positions. The Starr soils are on foot slopes and along small drainageways. Also included are small areas of Rabun soils on the less steep slopes and areas of soils that do not have stones on the surface. Included soils make up about 25 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is very rapid. The hazard of erosion is very severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content is low, and the natural fertility is medium. This soil commonly is strongly acid or medium acid, unless limed. Bedrock is generally at a depth of more than 60 inches.

Most areas of this soil are in permanent pasture or woodland.

This soil is not suited to hay and cultivated crops. The stones on the surface and steep slope make the use of tillage equipment impractical.

This soil is poorly suited to pasture crops. Establishing and maintaining a mixture of adapted grasses and legumes, use of proper stocking rates, rotation of

pasture, deferred grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface layer, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is high, especially for yellow-poplar, oaks, loblolly pine, and eastern white pine. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, mowing, and girdling. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits safe operation of heavy equipment.

This soil is limited for most nonfarm uses because of the steep slope. The slope and clayey subsoil are limitations for sanitary facilities. Low strength, slope, and excess fines limit the use of this soil as a source of roadfill. Slope limits recreational development. The soil is good for use as woodland wildlife habitat.

This soil is in capability subclass VIIc.

**74B—Rapidan silt loam, 2 to 7 percent slopes.** This deep, gently sloping, well drained soil is on narrow to broad convex ridgetops. Slopes are smooth and about 200 to 500 feet long. Areas of this soil commonly are irregularly rounded or oblong. They range from 5 to about 30 acres.

Typically, the surface layer of this soil is dark reddish brown silt loam about 6 inches thick. The subsoil is mostly dark red clay about 48 inches thick. The substratum to a depth of more than 60 inches is mostly reddish brown silty clay loam mottled in shades of red, yellow, and brown.

Included with this soil in mapping are small areas of well drained Hiwassee, Starr, and Totier soils. The Hiwassee and Totier soils are throughout the mapped area. The Starr soils are in depressions and along small drainageways. Also included are small areas of severely eroded soils that have a surface layer of dark reddish brown silty clay loam and small areas of soils that have stones on the surface. Included soils make up about 15 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is medium. The hazard of erosion is moderate. This soil has good tilth. The surface layer is friable and is easily tilled when moist. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content and natural fertility are medium. This soil commonly is medium acid or strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are farmed. Some areas are in woodland, and some areas are in pasture.

This soil is well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, eastern white pine, yellow-poplar, and oaks do well on this soil.

The low strength, moderate shrink-swell potential, depth to rock, and the clayey texture of the subsoil are the main limitations for nonfarm uses. The low strength and shrink-swell potential limit use of this soil for local roads and streets, and the clayey subsoil and depth to rock limit use of the soil for sanitary facilities. Slope is a limitation for playgrounds. Low strength and excess fines limit use of this soil as a source of roadfill.

This soil is in capability subclass IIc.

**74C—Rapidan silt loam, 7 to 15 percent slopes.** This deep, strongly sloping, well drained soil is on narrow convex ridgetops and on convex side slopes. Slopes are smooth and 200 to 600 feet long. Areas of this soil commonly are long and winding. They range from 5 to about 40 acres.

Typically, the surface layer of this soil is dark reddish brown silt loam about 6 inches thick. The subsoil is mostly dark red clay about 48 inches thick. The substratum to a depth of 60 inches or more is mostly reddish brown silty clay loam mottled in shades of red, yellow, and brown.

Included with this soil in mapping are small areas of well drained Penn, Starr, and Totier soils. The Penn and Totier soils are throughout the mapped area. The Starr soils are on foot slopes and along small drainageways. Also included are small areas of severely eroded soils that have a dark reddish brown silty clay loam surface layer and small areas of soils that have stones on the surface. Included soils make up about 15 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The surface layer is friable and easily tilled when moist. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content and natural fertility are medium. This soil

commonly is medium acid or strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are farmed. A few areas are in woodland or pasture.

This soil is moderately well suited to cultivated crops. The severe hazard of erosion is a major management concern. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, rotation of pasture, deferred grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil, increases runoff, and increases erosion.

Potential productivity for trees on this soil is high, especially for loblolly pine, eastern white pine, yellow-poplar, and oaks. Seeds and seedlings survive and grow well if competing vegetation is controlled.

Slope, low strength, moderate shrink-swell potential, depth to rock, and clayey subsoil are the main limitations for nonfarm uses. Slope, shrink-swell potential, and low strength limit the use of this soil for local roads and streets. Slope, depth to rock, and a clayey subsoil limit excavations and use of the soil for most sanitary facilities. Slope is a limitation for recreational development. Low strength and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass IIIe.

#### **74D—Rapidan silt loam, 15 to 25 percent slopes.**

This deep, moderately steep, well drained soil is on convex side slopes. Slopes commonly are simple and are 200 to 800 feet long. Areas of this soil are elongated or long and winding. They range from 5 to about 20 acres.

Typically, the surface layer of this soil is dark reddish brown silt loam about 6 inches thick. The subsoil is mostly dark red clay about 48 inches thick. The substratum to a depth of 60 inches or more is reddish brown silty clay loam mottled in shades of red, yellow, and brown.

Included with this soil in mapping are small areas of well drained Klinesville, Penn, Starr, and Totier soils. The Klinesville soils are mainly on the more sloping positions, near the breaks to steeper slopes and around outcrops of rock. The Penn and Totier soils are throughout the mapped area. The Starr soils are on foot slopes and along small drainageways. Also included are small areas of severely eroded soils that have a dark reddish brown

silty clay loam surface layer, small areas of gullied soils, and small areas that have stones on the surface. Included soils make up about 25 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The surface layer is moderately friable and easily tilled when moist. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content and natural fertility are medium. This soil is medium acid or strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are in woodland or permanent pasture.

This soil is poorly suited to cultivated crops. The severe hazard of erosion is a major management concern. The soil is somewhat droughty during the growing season, because of the rapid surface runoff, and crop response to lime and fertilizer is somewhat limited by this lack of moisture. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, eastern white pine, yellow-poplar, and oaks do well on this soil. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits safe operation of heavy equipment.

The slope, depth to rock, and clayey subsoil are the main limitations for nonfarm uses. Slope limits use of this soil as a building site, as a site for most sanitary facilities, and as a site for recreational areas. Slope, depth to rock, and the clayey subsoil limit use of the soil for sanitary landfills. Low strength and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass IVe.

**75C3—Rapidan silty clay loam, 7 to 15 percent slopes, severely eroded.** This soil is deep, strongly sloping, and well drained. It is on narrow, convex ridgetops and convex side slopes. Areas of this soil are 200 to 900 feet wide and are elongated along the ridge

and are highly variable in shape. They range from 5 to about 30 acres.

Typically, the surface layer of this soil is dark reddish brown silty clay loam about 4 inches thick. The subsoil is dark red clay about 42 inches thick. The substratum is mostly reddish brown silty clay loam mottled in shades of red, yellow, and brown to a depth of 60 inches or more.

Included with this soil in mapping are small areas of well drained Penn, Starr, and Totier soils. The Penn and Totier soils commonly are scattered throughout the mapped area. The Starr soils are in shallow depressions and along small drainageways. Also included are small areas of Rapidan soils that are not severely eroded. Included soils make up about 15 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. Tilth is poor, and the surface layer breaks up into clods if tilled when too wet. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content is low, and the natural fertility is medium. This soil commonly is strongly acid or medium acid, unless limed. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are farmed. Some areas are in permanent pasture or woodland.

This soil is poorly suited to cultivated crops. The severe hazard of erosion and the damage of past erosion are major management concerns. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, using cover crops, grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and control erosion. Increasing the organic matter content of this soil improves tilth, infiltration, and fertility. It also reduces crusting and improves soil-seed contact.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of adapted grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface layer and reduces plant growth and increases runoff and erosion.

The potential productivity for trees on this soil is moderately high, especially for yellow-poplar, oaks, loblolly pine, and eastern white pine. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, mowing, and girdling.

This soil is limited for most nonfarm uses. The slope, depth to rock, and clayey subsoil are limitations for sanitary facilities and excavations. Slope, moderate shrink-swell potential, and depth to rock are limitations

for most building sites. Slope limits this soil for lawns, landscaping, and golf fairways. Low strength and excess fines limit the use of this soil as a source of roadfill. Slope limits recreational development. The soil is good for use as openland and woodland wildlife habitats.

This soil is in capability subclass IVe.

**75D3—Rapidan silty clay loam, 15 to 25 percent slopes, severely eroded.** This soil is deep, moderately steep, and well drained. It is on side slopes. Areas of this soil are 200 to 500 feet wide and are along the drainage pattern. They range from 5 to about 20 acres.

Typically, the surface layer of this soil is dark reddish brown silty clay loam about 4 inches thick. The subsoil is dark red clay about 42 inches thick. The substratum is reddish brown silty clay loam mottled in shades of red, yellow, and brown to a depth of 60 inches.

Included with this soil in mapping are small areas of well drained Klinessville, Penn, Starr, and Totier soils. The Klinessville soils are near the breaks to steeper slopes and around outcrops of rock. The Penn and Totier soils commonly are scattered throughout the mapped area. The Starr soils are on foot slopes and along small drainageways. Also included are small areas of Rapidan soils that are not severely eroded. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. Tilth is poor, and the surface layer breaks up into clods if tilled when too wet. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content is low, and the natural fertility is medium. This soil commonly is strongly acid or medium acid, unless limed. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are in permanent pasture or woodland.

This soil is not suited to cultivated crops because past erosion has removed all or nearly all of the original topsoil.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of adapted grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface layer, reduces plant growth, and increases runoff and erosion.

The potential productivity for trees on this soil is moderately high, especially for yellow-poplar, oaks, loblolly pine, and eastern white pine. Seeds and seedlings survive and grow well if competing vegetation is controlled. The conditions for survival and growth can be improved by good site preparation, including cutting, spraying, mowing, and girdling. Logging roads and skid trails should be constructed on the contour to reduce the

concentration of runoff and help control erosion. The slope limits safe operation of heavy equipment.

This soil is limited for most nonfarm uses because of the steep slope. The slope, depth to rock, and clayey subsoil are limitations for sanitary facilities. Low strength, slope, and excess fines limit the use of this soil as a source of roadfill. Slope limits recreational development. The soil is good for use as woodland wildlife habitat.

This soil is in capability subclass VIe.

**76—Riverview loam.** This deep, nearly level, well drained soil is on flood plains along the rivers and large streams. Areas of this soil commonly are elongated along the course of the adjacent stream. They range from 5 to about 30 acres.

Typically, the surface layer is dark brown loam about 12 inches thick. The subsoil is about 23 inches thick. It is dark brown and brown, friable silt loam and loam. The substratum to a depth of 60 inches is dark yellowish brown silt loam.

Included with this soil in mapping are small intermingled areas, generally less than 3 acres, of excessively drained Buncombe soils, somewhat poorly drained Chewacla soils, and poorly drained Wehadkee soils. The Buncombe soils are on low lying, elongated ridges and along streambanks. The Chewacla and Wehadkee soils are in depressions generally away from the adjacent stream or river. Also included are small areas of very gravelly soils in abandoned channels. Included soils make up about 25 percent of mapped areas.

Permeability is moderate, and available water capacity is high. Runoff is slow. Tilth is good. Natural fertility is moderate, and organic matter content is low. The subsoil has low shrink-swell potential. The root zone extends to a depth of about 60 inches. The surface layer and subsoil commonly are very strongly acid or strongly acid, unless limed. The depth to bedrock is generally more than 5 feet and not usually a factor in the use of this soil. Flooding occurs occasionally for brief periods during winter and early in spring, and a seasonal high water table is between depths of 3 and 5 feet.

Most areas of this soil are farmed and in cultivated crops. A few areas are in hay or pasture.

This soil is well suited to cultivated crops. The hazard of erosion is slight and is not a major management concern. Occasional flooding is a hazard to some crops, especially winter grains. Some management concerns are the need to increase organic matter and the use of lime and fertilizer according to soil tests. If the soil is cultivated, conservation tillage, use of cover crops, and including grasses and legumes in the cropping system help increase organic matter and maintain the tilth of the soil. Crop residue should be kept on or near the surface.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes and overgrazing are major pasture management

concerns. Proper stocking rates to maintain desirable grasses and legumes, controlled grazing, and use of lime and fertilizer according to soil tests are useful in pasture management.

Potential productivity for trees on this soil is very high. The soil is managed mostly for hardwoods. Seeds and seedlings survive and grow well on this soil.

Flooding is the main limitation for nonfarm uses. It is a limitation for most sanitary facilities, building sites, and recreational areas. The soil is good as a source of material for roadfill.

This soil is in capability subclass IIw.

**77—Riverview-Chewacla complex.** This complex consists of deep, nearly level, well drained and somewhat poorly drained soils on flood plains along smaller streams. Areas of this complex are commonly elongated and parallel to the adjacent stream. They range from 10 to about 50 acres.

This complex is about 50 percent Riverview soils and 40 percent Chewacla soils. Other soils make up the rest.

Typically, the surface layer of the Riverview soil is dark brown loam about 12 inches thick. The subsoil is dark brown and brown, friable silt loam and loam about 23 inches thick. The substratum to a depth of 60 inches is dark yellowish brown silt loam.

Typically, the surface layer of the Chewacla soil is dark brown silt loam about 8 inches thick. The upper 18 inches of the subsoil is light yellowish brown silt loam and pale brown silty clay loam, and the lower part to a depth of 60 inches is mostly light brownish gray and yellowish brown silty clay loam and silt loam.

Included with this complex in mapping are small intermingled areas, generally less than 2 acres, of excessively drained Buncombe soils and poorly drained Wehadkee soils. The Buncombe soils are on low lying, elongated ridges and along streambanks. The Wehadkee soils are in depressions generally away from the adjacent stream. The included soils make up about 10 percent of mapped areas.

Permeability of these soils is moderate, and available water capacity is high. Runoff is slow. Tilth is good. The natural fertility is moderate, and the organic matter content is low. The subsoil in both soils has low shrink-swell potential. The root zone extends to a depth of more than 36 inches. The surface layer and subsoil commonly are very strongly acid to medium acid, unless limed. Bedrock is generally deep. Flooding occurs occasionally for brief periods during winter and early in spring. During winter and early in spring, the high water table is between depths of 1/2 foot and 1 1/2 feet in the Chewacla soil and between depths of 3 and 5 feet in the Riverview soil.

Most areas of this complex are used for cultivated crops. A few areas are in pasture or woodland.

Areas of this complex are well suited to cultivated crops when drained and protected from flooding. The

hazard of erosion is slight and is not a major management concern. Seasonal wetness is a concern for small grains and alfalfa, and drainage is needed for the Chewacla soil. The need to increase organic matter content and applying lime and fertilizer according to soil tests to maintain fertility are management concerns. Conservation tillage, the use of cover crops, and including grasses and legumes in the cropping system help increase organic matter content and maintain tilth. Crop residue should be kept on or near the surface.

These soils are well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes and overgrazing are major pasture management concerns. Proper stocking rates to maintain desirable grasses and legumes, controlled grazing, and use of lime and fertilizer according to soil tests are useful in pasture management.

Potential productivity for trees on this complex is very high. The soil is managed mostly for hardwoods. Seeds and seedlings are limited by the seasonal wetness of the Chewacla soil.

Flooding and wetness are the main limitations for nonfarm uses. Flooding and wetness are limitations for most sanitary facilities, building sites, and recreational areas. This complex is a poor source of roadfill.

This complex is in capability subclass IIIw.

**78—Rowland silt loam.** This deep, nearly level, moderately well drained to somewhat poorly drained soil is on flood plains. Slopes are 0 to 2 percent. Areas of this low-lying soil commonly are long and narrow. They range from 5 to about 30 acres.

Typically, the surface layer of this soil is dark reddish brown silt loam about 11 inches thick. The subsoil is 27 inches thick. The upper part of the subsoil to a depth of 30 inches is mostly reddish brown silt loam and has pinkish gray mottles below a depth of 16 inches. The lower part of the subsoil to a depth of 38 inches is multicolored reddish brown, gray, and strong brown silty clay loam. The substratum to a depth of 60 inches is yellowish red very gravelly silt loam and has weak red and gray mottles.

Included with this soil in mapping are small areas of well drained Bermudian soils, well drained to moderately well drained Manassas soils, and poorly drained Wehadkee soils. The Bermudian soils are on slightly higher positions, mainly close to the stream. The Manassas soils are on higher positions, generally away from the stream and on foot slopes. The Wehadkee soils are in depressions and on flats generally away from the stream at the base of upland side slopes. Also included are small areas of sandy soils and gravelly soils. Included soils make up about 15 percent of mapped areas.

Permeability is moderate or moderately slow, and available water capacity is high. Surface runoff is slow. The hazard of erosion is slight. This soil has good tilth.

The surface layer is friable and easily tilled. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches. The organic matter content is moderate, and the natural fertility is medium. This soil commonly is medium acid or strongly acid throughout, but reaction of the surface layer varies because of local liming. Flooding occurs occasionally for brief periods during winter and early in spring. A seasonal high water table is at a depth of 1 foot to 3 feet during winter and spring.

Most areas of this soil are in pasture. A few areas are in woodland, and a few areas are in cultivated cropland.

This soil is well suited to cultivated crops. Alfalfa is short lived because of seasonal wetness. When lime and fertilizer are applied according to soil tests, crops respond well. The soil is wet and cold in spring, and wetness commonly interferes with tillage. If the soil is not protected from flooding, crops are damaged by brief flooding on an average of once or less every 2 years. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, drainage, control of flooding, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is wet causes compaction of the surface soil and damages stands of grasses and legumes.

Potential productivity for trees on this soil is high, especially for loblolly pine, yellow-poplar, and sweetgum. Seeds and seedlings are limited by the seasonal wetness. The soil is soft when wet, and the use of heavy equipment is limited during wet periods.

The shallow depth to the seasonal high water table and flooding are the main limitations for nonfarm uses. The seasonal high water table and flooding prevent use of this soil as a building site or as a site for most sanitary facilities. The water table and flooding limit recreational areas. Many areas dry out slowly in spring and after heavy rains. Excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass IIw.

**79B—Starr silt loam, 2 to 7 percent slopes.** This deep, gently sloping, well drained soil is on foot slopes, in depressions, and along small drainageways. Slopes are smooth, slightly concave, and about 100 to 400 feet long. Most areas of this soil are long and winding. They range from 3 to about 15 acres.

Typically, the surface layer of this soil is reddish brown silt loam about 18 inches thick. The subsoil is about 35 inches thick. It is mostly reddish brown silty clay loam.

The substratum to a depth of 60 inches or more is reddish brown loam.

Included with this soil in mapping are small areas of well drained Davidson, Dyke, and Rabun soils, well drained to moderately well drained Meadowville soils, and moderately well drained to somewhat poorly drained Mount Lucas soils. The Davidson, Dyke, and Rabun soils are on the higher positions and low ridges. The Meadowville and Mount Lucas soils are throughout the mapped area. Also included are small areas of gravelly soils. Included soils make up about 20 percent of mapped areas.

Permeability is moderate, and available water capacity is high. Surface runoff is medium. The hazard of erosion is moderate. This soil has good tilth. The surface layer is friable and easily tilled through a wide range of soil moisture. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 50 inches or more. The organic matter content is low, and the natural fertility is medium. This soil commonly is strongly acid to slightly acid throughout, but reaction in the surface layer is variable because of local liming. The depth to bedrock is generally more than 6 feet.

Most areas of this soil are farmed. Some areas are in pasture, and a few areas are in woodland.

This soil is well suited to cultivated crops. The moderate hazard of erosion and runoff from higher lying areas are major management concerns. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing or grazing when the soil is wet causes compaction of the surface soil, and damages stands of grasses and legumes.

Potential productivity for trees on this soil is very high, especially for loblolly pine, yellow-poplar, sweetgum, and oaks. Seeds and seedlings survive and grow well.

The moderate shrink-swell potential, low strength, and moderate permeability in the subsoil are the main limitations for nonfarm uses. The low strength and shrink-swell potential limit use of this soil for local roads and streets and as a building site. The moderate permeability of the subsoil limits most sanitary facilities. Slope is a limitation for playgrounds. The low strength and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass IIe.

**80B—Tatum silt loam, 2 to 7 percent slopes.** This deep, gently sloping, well drained soil is on narrow to moderately wide convex ridgetops. Areas of this soil commonly are irregularly rounded or oblong. They range from 5 to about 25 acres.

Typically, the surface layer of this soil is grayish brown and light yellowish brown silt loam about 6 inches thick. The subsoil is mostly red silty clay, clay, and silty clay loam about 36 inches thick. The substratum to a depth of 51 inches is multicolored yellow, red, brown, and gray channery silt loam.

Included with this soil in mapping are small areas of moderately well drained Abell soils, somewhat excessively drained Manteo soils, and well drained Nason soils. The Abell soils are around the heads of small drainageways. The Manteo and Nason soils are throughout the mapped area. Also included are small areas of soils that have a gravelly surface layer. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is medium. The hazard of erosion is moderate. This soil has good tilth. The surface layer is friable and easily tilled. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content and the natural fertility are low. This soil is commonly strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 40 inches.

Most areas of this soil are in woodland. Some areas are farmed.

This soil is well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. The high acidity and high content of aluminum are major limitations for this soil. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil.

The low strength, moderate shrink-swell potential, and the moderately permeable, clayey subsoil are the main limitations for nonfarm uses. The low strength and the shrink-swell potential limit use of this soil as a building site, and the clayey subsoil limits excavations. When wet,

the clayey subsoil limits vehicular traffic. The moderately permeable subsoil limits use of the soil for septic tank absorption fields. Permeability of the substratum commonly is not a limiting factor for septic tank absorption fields. Low strength and excess fines limit the use of the soil as a source of roadfill.

This soil is in capability subclass IIe.

**80C—Tatum silt loam, 7 to 15 percent slopes.** This deep, strongly sloping, well drained soil is on convex ridgetops and convex side slopes. Areas of this soil commonly are long and winding. They range from 5 to about 25 acres.

Typically, the surface layer of this soil is grayish brown and light yellowish brown silt loam about 6 inches thick. The subsoil is mostly red silty clay, clay, and silty clay loam about 36 inches thick. The substratum to a depth of 51 inches is multicolored red, yellow, brown, and gray channery silt loam.

Included with this soil in mapping are small areas of moderately well drained Abell soils, somewhat excessively drained Manteo soils, and well drained Nason soils. The Abell soils are around the heads of drainageways, along drainageways, and on toe slopes. The Manteo and Nason soils are mainly on ridgetops and points of ridges. Also included are small areas of soils that have a gravelly surface layer and of severely eroded soils that have a red clay or silty clay loam surface layer. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The surface layer is friable and easily tilled when moist. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content and the natural fertility are low. This soil commonly is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 40 inches.

Most areas of this soil are in woodland. Some areas are farmed.

This soil is moderately well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. The high acidity and high content of aluminum are major limitations for this soil. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture.

Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high, especially for loblolly pine, Virginia pine, yellow-poplar, and oaks. Seeds and seedlings survive and grow well if competing vegetation is controlled.

Slope, low strength, moderate shrink-swell potential, and moderately permeable clayey subsoil are the main limitations for nonfarm uses. Slope, the low strength, and the shrink-swell potential limit use of this soil as a building site, and the clayey subsoil limits excavations. When wet, the clayey subsoil limits vehicular traffic. Slope and the moderately permeable subsoil limit use of the soil for septic tank absorption fields and for recreational areas. Permeability of the substratum commonly is not a limiting factor for septic tank absorption fields. Low strength and excess fines limit the use of the soil as a source of roadfill.

This soil is in capability subclass IIIe.

**81B—Thurmont loam, 2 to 7 percent slopes.** This deep, gently sloping, well drained soil is on elongated ridges. Slopes are smooth and about 200 to 400 feet long. Areas of this soil commonly are long and winding. They range from 5 to about 50 acres.

Typically, the surface layer of this soil is dark grayish brown and brown loam about 10 inches thick. The subsoil is brown loam and yellowish red clay loam and sandy clay loam about 36 inches thick. The substratum is mostly yellowish red loam mottled with light yellowish brown to a depth of 60 inches.

Included with this soil in mapping are small areas of somewhat poorly drained Belvoir soils, well drained Braddock and Chester soils, and well drained to moderately well drained Meadowville soils. The Belvoir and Meadowville soils are in depressions and around the heads of drainageways. The Braddock and Chester soils are throughout the mapped area. Also included are small areas of soils that have a gravelly or very stony surface layer and severely eroded soils that have a surface layer of yellowish red clay loam. Included soils make up about 20 percent of mapped areas.

Permeability is moderate, and available water capacity is high. Surface runoff is medium. The hazard of erosion is moderate. This soil has good tilth. The surface layer is friable and easily tilled. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content and the natural fertility are low. This soil commonly is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. A seasonal high water table is at a depth of 4 to 6 feet in December through March. Bedrock is generally at a depth of more than 60 inches.

Most areas of this soil are farmed. Some areas are in pasture, and a few areas are in woodland.

This soil is well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil.

The potential frost action and moderately permeable subsoil are the main limitations for nonfarm uses. The moderately permeable subsoil limits this soil for septic tank absorption fields and for sewage lagoon areas. The potential frost action is a limitation for local roads and streets. Slope is a limitation for playgrounds. The soil is a good source of roadfill.

This soil is in capability subclass IIe.

**81C—Thurmont loam, 7 to 15 percent slopes.** This deep, strongly sloping, well drained soil is on narrow, convex ridgetops and on convex side slopes. Slopes are smooth and about 200 to 400 feet long. Areas of this soil commonly are long and winding. They range from 5 to about 40 acres.

Typically, the surface layer of this soil is dark grayish brown and brown loam about 10 inches thick. The subsoil is about 36 inches thick. It is brown loam and yellowish red clay loam and sandy clay loam. The substratum to a depth of 60 inches is mostly yellowish red loam mottled with light yellowish brown.

Included with this soil in mapping are small areas of somewhat poorly drained Belvoir soils, well drained Braddock and Chester soils, and well drained to moderately well drained Meadowville soils. The Belvoir and Meadowville soils are on foot slopes and around the heads of drainageways. The Braddock and Chester soils are throughout the mapped area. Also included are small areas of soils that have a gravelly or very stony surface layer and small areas of severely eroded soils that have a yellowish red clay loam surface layer. Included soils make up about 20 percent of mapped areas.

Permeability is moderate, and available water capacity is high. Surface runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The surface layer is friable and easily tilled when moist. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content and the natural fertility are low. This soil commonly is strongly

acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. A seasonal high water table is at a depth of 4 to 6 feet from December through March. Bedrock is generally at a depth of more than 60 inches.

Many areas of this soil are farmed. Some areas are in pasture, and some areas are in woodland.

This soil is moderately well suited to cultivated crops. The severe hazard of erosion is a major management concern. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil. Seeds and seedlings survive and grow well if competing vegetation is controlled.

Slope, moderately permeable subsoil, and potential frost action are the main limitations for nonfarm uses. Slope limits use of this soil as a building site and for recreational development. Slope and the moderately permeable subsoil limit use of the soil for most sanitary facilities. The potential frost action and slope are limitations for local roads and streets. The soil is a good source of roadfill.

This soil is in capability subclass IIIe.

**81D—Thurmont loam, 15 to 25 percent slopes.** This deep, moderately steep, well drained soil is on convex side slopes leading down to drainageways. Slopes are smooth and about 200 to 400 feet long. Areas of this soil commonly are long and wide. They range from 10 to 30 acres or more.

Typically, the surface layer of this soil is dark grayish brown and brown loam about 10 inches thick. The subsoil is about 36 inches thick. It is brown loam and yellowish red clay loam and sandy clay loam. The substratum to a depth of 60 inches is mostly yellowish red loam mottled with light yellowish brown.

Included with this soil in mapping are small areas of somewhat poorly drained Belvoir soils, well drained Braddock and Chester soils, and well drained to moderately well drained Meadowville soils. The Belvoir and Meadowville soils are on foot slopes and around the heads of drainageways. The Braddock and Chester soils are throughout the mapped area. Also included are small areas of soils that have a very stony surface layer and

small areas of severely eroded soils that have a yellowish red clay loam surface layer. Included soils make up about 25 percent of mapped areas.

Permeability is moderate, and available water capacity is high. Surface runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The surface layer is friable and easily tilled when moist. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content and the natural fertility are low. This soil commonly is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. A seasonal high water table is at a depth of 4 to 6 feet from December through March. Bedrock is generally at a depth of more than 60 inches.

Many areas of this soil are in woodland. Some areas are in pasture.

This soil is poorly suited to cultivated crops. The severe hazard of erosion is a major management concern. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil. Seeds and seedlings survive and grow well if competing vegetation is controlled. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and control erosion. The slope limits safe operation of heavy equipment.

The slope is the main limitation for nonfarm uses. Slope limits use of this soil as a building site, for recreational development, and for most sanitary facilities. The slope and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass IVe.

**82C—Thurmont very stony loam, 7 to 15 percent slopes.** This deep, strongly sloping, well drained soil is on narrow, convex ridgetops, and convex side slopes. Stones, about 3 to 10 feet apart, cover 3 to 15 percent of the surface. Slopes are smooth and about 200 to 400 feet long. Areas of this soil commonly are long and winding. They range from 5 to about 50 acres.

Typically, the surface layer of this soil is dark grayish brown and brown loam about 10 inches thick. The subsoil is about 36 inches thick. It is brown loam and

yellowish red clay loam and sandy clay loam. The substratum to a depth of 60 inches is mostly yellowish red loam with light yellowish brown mottles.

Included with this soil in mapping are small areas of well drained Braddock, Chester, and Hayesville soils. These soils are throughout the mapped area. Also included are small areas of soils that do not have stones on the surface. Included soils make up about 25 percent of mapped areas.

Permeability is moderate, and available water capacity is high. Surface runoff is rapid. The hazard of erosion is severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content and the natural fertility are low. This soil commonly is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. A seasonal high water table is at a depth of 4 to 6 feet from December through March. Bedrock is generally at a depth of more than 60 inches.

Most areas of this soil are in woodland. A few areas are in permanent pasture.

This soil is not suited to hay and cultivated crops. Sufficient stones are present to make use of modern equipment impractical.

This soil is moderately well suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil. Seeds and seedlings survive and grow well if competing vegetation is controlled.

Slope, moderately permeable subsoil, and stones are the main limitations for nonfarm uses. Slope limits use of this soil as a building site. Slope and the moderately permeable subsoil limit most sanitary facilities. The stones and slope limit use of the soil for recreational development. The soil is a good source of roadfill.

This soil is in capability subclass VIc.

**82D—Thurmont very stony loam, 15 to 25 percent slopes.** This deep, moderately steep, well drained soil is on side slopes. Stones, about 3 to 10 feet apart, cover 3 to 15 percent of the surface. Slopes are smooth and about 300 to 500 feet long. Areas of this soil commonly are long and wide. They range from 5 to 50 acres.

Typically, the surface layer of this soil is dark grayish brown and brown loam about 10 inches thick. The subsoil is about 36 inches thick. It is brown loam and yellowish red clay loam and sandy clay loam. The substratum to a depth of 60 inches is mostly yellowish red loam with light yellowish brown mottles.

Included with this soil in mapping are small areas of well drained Braddock, Chester, and Hayesville soils.

These soils are throughout the mapped area. Also included are small areas of soils that have stones on the surface. Included soils make up about 25 percent of mapped areas.

Permeability is moderate, and available water capacity is high. Surface runoff is rapid. The hazard of erosion is severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content is moderate, and the natural fertility is low. This soil commonly is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. A seasonal high water table is at a depth of 4 to 6 feet from December through March. Bedrock is generally at a depth of more than 60 inches.

Most areas of this soil are in woodland. A few areas are in permanent pasture.

This soil is not suited to hay and cultivated crops. Sufficient stones are present to make use of modern equipment impractical.

This soil is moderately well suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. Loblolly pine, Virginia pine, yellow-poplar, and upland oaks do well on this soil. Seeds and seedlings survive and grow well if competing vegetation is controlled.

Slope is the main limitation for nonfarm uses. Slope limits use of this soil as a building site and for recreational development. It limits use of the soil for most sanitary facilities and for local roads and streets. The soil is a fair source of roadfill.

This soil is in capability subclass VIIc.

**83—Toccoa fine sandy loam.** This deep, nearly level, well drained soil is on flood plains. Areas of this low-lying soil commonly are long and narrow. They range from 3 to about 50 acres. Slopes are 0 to 2 percent.

Typically, the surface layer of this soil is dark brown fine sandy loam about 9 inches thick. The substratum to a depth of 60 inches or more is mostly brown and dark yellowish brown sandy loam and fine sandy loam.

Included with this soil in mapping are small areas of excessively drained Buncombe soils, somewhat poorly drained Chewacla soils, and well drained Riverview soils. The Chewacla soils are on the slightly lower positions, mainly farthest from the stream. The Buncombe and Riverview soils are throughout the mapped area. Also included are small areas of soils that have a gravelly surface layer. Included soils make up about 15 percent of mapped areas.

Permeability is moderately rapid, and available water capacity is moderate. Surface runoff is slow. The hazard

of erosion is slight. This soil has good tilth. The surface layer is friable and easily tilled. The substratum has low shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content is low, and the natural fertility is medium. This soil commonly is slightly acid or medium acid throughout, but reaction in the surface layer is variable because of local liming. Flooding occurs occasionally for brief periods during winter and spring, and a seasonal high water table is at a depth of 2 1/2 to 5 feet.

Most areas of this soil are in pasture. Some areas are farmed, and a few areas are in woodland.

If this soil is protected from flooding, it is well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. If the soil is not protected from flooding, crops are damaged by brief flooding during spring on an average of once every 5 years. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, control of flooding, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing and grazing when the soil is wet causes compaction of the surface soil and damages stands of grasses and legumes.

Potential productivity for trees on this soil is very high, especially for loblolly pine, yellow-poplar, and sweetgum. Seeds and seedlings survive and grow well if competing vegetation is controlled.

Flooding, moderately rapid permeability, and wetness are the main limitations for nonfarm uses. Flooding prevents use of this soil as a building site. Flooding, seepage, and wetness limit most sanitary facilities. Flooding and wetness limit excavations, and flooding limits use of the soil for recreational areas. The soil is a good source of roadfill.

This soil is in capability subclass IIw.

**84B—Totier silt loam, 2 to 7 percent slopes.** This deep, gently sloping, well drained soil is on convex ridgetops. Slopes are smooth and 100 to 600 feet long. Areas of this soil commonly are irregularly rounded or elongated. They range from 5 to about 50 acres.

Typically, the surface layer of this soil is reddish brown silt loam about 8 inches thick. The subsoil is about 32 inches thick. It is yellowish red silty clay loam and red silty clay. The substratum to a depth of 49 inches is red, shaly silty clay. Below this is soft, red shale.

Included with this soil in mapping are small areas of moderately well drained to well drained Manassas soils and well drained Penn and Rapidan soils. The Manassas soils are in depressions and along small drainageways.

The Penn and Rapidan soils are throughout the mapped area. Also included are small areas of severely eroded soils that have a surface layer of yellowish red silty clay loam. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is medium. The hazard of erosion is moderate. This soil has good tilth. The surface layer is friable and easily tilled. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 36 inches or more. The organic matter content is moderate, and the natural fertility is medium. This soil commonly is medium acid to very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are farmed.

This soil is well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil.

The low strength, moderate shrink-swell potential, depth to bedrock, and moderately permeable clayey subsoil are the main limitations for nonfarm uses. The shrink-swell potential limits use of this soil as a building site, and the clayey subsoil limits excavations. When wet, the clayey subsoil limits vehicular traffic. The clayey, moderately permeable subsoil and the depth to bedrock limit use of the soil for most sanitary facilities. Low strength and excess fines limit use of the soil as a source of roadfill. Slope is a limitation for playgrounds. The soil is good for use as openland and woodland wildlife habitats.

This soil is in capability subclass IIe.

**84C—Totler silt loam, 7 to 15 percent slopes.** This deep, strongly sloping, well drained soil is on side slopes. Slopes are smooth and 100 to 600 feet long. Areas of this soil commonly are irregularly elongated. They range from 5 to about 50 acres.

Typically, the surface layer of this soil is reddish brown silt loam about 8 inches thick. The subsoil is about 32 inches thick. It is yellowish red silty clay loam and red

silty clay. The substratum to a depth of 49 inches is red, shaly silty clay. Below this is soft, red shale.

Included with this soil in mapping are small areas of moderately well drained to well drained Manassas soils and well drained Penn and Rapidan soils. The Manassas soils are on foot slopes and along small drainageways. The Penn and Rapidan soils are throughout the mapped area. Also included are small areas of severely eroded soils that have a surface layer of yellowish red silty clay loam. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The surface layer is friable and easily tilled. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 36 inches or more. The organic matter content is moderate, and the natural fertility is medium. This soil commonly is medium acid to very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are farmed. Some areas are in pasture and hayland.

This soil is moderately well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil.

The low strength, slope, moderate shrink-swell potential, depth to bedrock, and the moderately permeable clayey subsoil are the main limitations for nonfarm uses. The shrink-swell potential and the slope limit use of this soil as a building site, and the clayey subsoil and slope limit excavations. When wet, the clayey subsoil limits vehicular traffic. The clayey, moderately permeable subsoil, the slope, and the depth to bedrock limit use of the soil for most sanitary facilities. Low strength and excess fines limit use of the soil as a source of roadfill. Slope is a limitation for playgrounds. The soil is good for use as openland and woodland wildlife habitats.

This soil is in capability subclass IIIe.

**85C3—Totler silty clay loam, 7 to 15 percent slopes, severely eroded.** This deep, strongly sloping, well drained soil is on convex side slopes. Slopes are smooth and 100 to 600 feet long. Areas of this soil commonly are long and irregular. They range from 5 to about 50 acres.

Typically, the surface layer of this soil is yellowish red silty clay loam about 5 inches thick. The subsoil is mostly red silty clay loam and silty clay to a depth of 33 inches. The substratum to a depth of 45 inches is mostly red, shaly silty clay. Below this is soft, red shale.

Included with this soil in mapping are small areas of moderately well drained to well drained Manassas soils and well drained Penn and Rapidan soils. The Manassas soils are in depressions and along small drainageways. The Penn and Rapidan soils are throughout the mapped area. Also included are small areas of soils that are not severely eroded and have a surface layer of reddish brown silt loam. Included soils make up about 20 percent of mapped areas.

Permeability and the available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. This soil has fair tilth. The surface layer is friable and easily tilled but breaks up into clods if tilled when too wet or too dry. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 30 inches or more. The organic matter content is low, and natural fertility is medium. This soil commonly is medium acid to very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 50 inches.

Many areas of this soil are farmed. A few areas are in woodland.

This soil is poorly suited to cultivated crops. The severe hazard of erosion and the damage of past erosion are major management concerns. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil.

The low strength, slope, moderate shrink-swell potential, depth to bedrock, and moderately permeable, clayey subsoil are the main limitations for nonfarm uses.

The slope and the shrink-swell potential limit use of this soil as a building site, and the clayey subsoil and slope limit excavations. When wet, the clayey subsoil limits vehicular traffic. The clayey, moderately permeable subsoil, the depth to rock, and slope limit most sanitary facilities. Low strength and excess fines limit use of the soil as a source of roadfill. Slope is a limitation for recreational development. The soil is good for use as openland and woodland wildlife habitats.

This soil is in capability subclass IVe.

**86B—Turbeville loam, 2 to 7 percent slopes.** This deep, gently sloping, well drained soil is on convex ridgetops. Areas of this soil commonly are irregularly rounded or elongated. They range from 3 to about 20 acres.

Typically, the surface layer of this soil is dark brown loam about 12 inches thick. The subsoil is mostly yellowish red and dark red clay and clay loam to a depth of 70 inches or more.

Included with this soil in mapping are small areas of well drained Hiawassee and Masada soils. These soils are throughout the mapped area. Also included are small areas of soils that have a gravelly surface layer and of severely eroded soils that have a surface layer of reddish brown clay loam. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is medium. The hazard of erosion is moderate. The surface layer is friable and easily tilled. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 60 inches or more. The organic matter content is low, and the natural fertility is medium. This soil commonly is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 5 feet.

Many areas of this soil are farmed. Some areas are in woodland.

This soil is well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, rotation of pasture, deferred grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high. Seeds and seedlings survive and grow well if competing vegetation is controlled. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil.

The low strength, the moderate shrink-swell potential, and the moderately permeable, clayey subsoil are the main limitations for nonfarm uses. The low strength and the shrink-swell potential limit use of this soil as a building site, and the clayey subsoil limits excavations. When wet, the clayey subsoil limits vehicular traffic. The moderately permeable subsoil limits use of the soil for septic tank absorption fields. Low strength and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass IIe.

**86C—Turbeville loam, 7 to 15 percent slopes.** This deep, strongly sloping, well drained soil is on convex side slopes. Areas of this soil commonly are long and irregular in shape. They range from 3 to about 20 acres.

Typically, the surface layer of this soil is dark brown loam about 12 inches thick. The subsoil is mostly yellowish red and dark red clay loam and clay to a depth of 70 inches or more.

Included with this soil in mapping are small areas of well drained Hiawasse and Masada soils. These soils are throughout the mapped area. Also included are small areas of soils that have a gravelly surface layer and of severely eroded soils that have a surface layer of reddish brown clay loam. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Surface runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The surface layer is friable and is easily tilled when moist. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 60 inches or more. The organic matter content is low, and the natural fertility is medium. This soil commonly is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. Depth to bedrock is more than 5 feet.

Many areas of this soil are farmed. Some areas are in woodland.

This soil is moderately well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high. Seeds and seedlings survive and grow

well if competing vegetation is controlled. Loblolly pine, Virginia pine, yellow-poplar, and oaks do well on this soil.

The low strength, slope, the moderate shrink-swell potential, and the moderately permeable, clayey subsoil are the main limitations for nonfarm uses. The low strength, slope, and the shrink-swell potential limit use of this soil as a building site, and the clayey subsoil and slope limit excavations. When wet, the clayey subsoil limits vehicular traffic. The slowly permeable subsoil and slope limit use of the soil for septic tank absorption fields. Low strength and excess fines limit use of this soil as a source of roadfill.

This soil is in capability subclass IIIe.

**87B—Tusquee stony loam, 2 to 7 percent slopes.** This deep, gently sloping, well drained soil is in hollows and on benches and foot slopes. Stones, 10 to 60 feet apart, cover 0.1 to 3 percent of the surface. Slopes are smooth and about 100 to 400 feet long. Areas of this soil are along the drainageways and are elongated and irregular in shape. They range from 5 to about 20 acres.

Typically, the surface layer is very dark brown and dark brown loam about 9 inches thick. The subsoil is about 36 inches thick. It is mostly brown and strong brown gravelly or very cobbly clay loam. The substratum to a depth of 63 inches is strong brown and dark yellowish brown very gravelly or very cobbly sandy loam.

Included with this soil in mapping are small intermingled areas, generally less than 2 acres, of somewhat poorly drained Belvoir soils, well drained Craigsville and Thurmont soils and well drained moderately well drained Meadowville soils. The Belvoir soils are at the heads of drainageways and in depressions. The Craigsville soils are along streams on flood plains. The Meadowville soils are throughout the mapped area. The Thurmont soils generally are on slightly higher benches. Also included are small areas of soils that do not have stones on the surface, small areas of soils that have a very stony surface layer, and small areas of outcrops of rock. The included soils and outcrops make up about 15 percent of mapped areas.

Permeability and available water capacity are moderate. Runoff is medium. The hazard of erosion is moderate. This soil has good tilth. The organic matter content is high, and the natural fertility is medium. The subsoil has low shrink-swell potential. The root zone extends to a depth of more than 40 inches. The surface layer and subsoil are strongly acid or medium acid, unless limed. Generally, depth to bedrock is more than 5 feet.

Most areas of this soil are in woodland. A few areas are in pasture or orchards.

This soil is poorly suited to cultivated crops. In cultivated cropland, conservation tillage, stubble mulching, use of cover crops, use of grasses and legumes in the cropping system, and contour stripcropping help reduce runoff and control erosion.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes and overgrazing are major concerns in management. Proper stocking rates to maintain desirable grasses and legumes, controlled grazing, and use of lime and fertilizer according to soil tests are useful in pasture management. If the pasture is overgrazed, runoff is increased and soil losses by erosion are excessive.

Potential productivity for trees on this soil is high. The soil is managed for mixed hardwoods and pines. Thinning stands for rapid growth, clear cutting, replanting with fast-growing species, and removal of insect- or disease-infected trees help increase timber production.

The moderately permeable subsoil is the main limitation for nonfarm use. It is a limitation for sanitary landfills and sewage lagoons. This soil is good for use as building sites and as a source of roadfill.

This soil is in capability subclass IVs.

**87C—Tusquittee stony loam, 7 to 15 percent slopes.** This deep, strongly sloping, well drained soil is in hollows and on benches and foot slopes. Stones, 10 to 60 feet apart, cover 0.1 to 3 percent of the surface. Slopes are smooth and about 100 to 500 feet long. Areas of this soil are along the drainageways and are elongated and irregular in shape. They range from 5 to 20 acres.

Typically, the surface layer is very dark brown and dark brown loam about 9 inches thick. The subsoil is about 36 inches thick. It is mostly strong brown gravelly or very cobbly clay loam. The substratum to a depth of 63 inches is strong brown and dark yellowish brown very gravelly or very cobbly sandy loam.

Included with this soil in mapping are small intermingled areas, generally less than 2 acres, of somewhat poorly drained Belvoir soils, well drained Chester and Thurmont soils, and well drained to moderately well drained Meadowville soils. The Belvoir soils are at the heads of drainageways and in depressions. The Chester soils are on the side slopes of surrounding ridges. The Meadowville soils are throughout the mapped area. The Thurmont soils generally are on slightly higher benches. Also included are small areas of soils that do not have stones on the surface, small areas of soils that have a very stony surface layer, and small areas of outcrops of rock. The included soils and outcrops make up about 15 percent of mapped areas.

Permeability and available water capacity are moderate. Runoff is rapid. The hazard of erosion is severe. This soil has good tilth. The organic matter content is high, and the natural fertility is medium. The subsoil has low shrink-swell potential. The root zone extends to a depth of more than 40 inches. The surface layer and subsoil are strongly acid or medium acid, unless limed. Depth to bedrock is generally more than 5 feet.

Most areas of this soil are in woodland. A few areas are in pasture or orchards.

This soil is poorly suited to cultivated crops. The severe hazard of erosion and stones on the surface are major concerns in management. Conservation tillage, stubble mulching, use of cover crops, use of grasses and legumes in the cropping system, and contour stripcropping help to reduce runoff and control erosion.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes and overgrazing are major concerns of management. Proper stocking rates to maintain desirable grasses and legumes, controlled grazing, and use of lime and fertilizer according to soil tests are useful in pasture management. If the pasture is overgrazed, runoff is increased and soil losses by erosion are excessive.

Potential productivity for trees on this soil is high. The soil is managed for mixed hardwoods and pines. Thinning stands for rapid growth, clear cutting, replanting with fast-growing species, and removal of insect- or disease-infected trees help to increase timber production.

The moderately permeable subsoil and slope are the main limitations for nonfarm uses. These are limitations for sanitary facilities, building sites, and recreational areas. The soil is good as a source of roadfill.

This soil is in capability subclass IVs.

**87D—Tusquittee stony loam, 15 to 25 percent slopes.** This deep, moderately steep, well drained soil is in hollows and on benches and foot slopes. Stones, 10 to 60 feet apart, cover 0.1 to 3 percent of the surface. Slopes are smooth and about 100 to 500 feet long. Areas of this soil are elongated and irregular in shape. They range from 5 to about 20 acres.

Typically, the surface layer is very dark brown and dark brown loam about 9 inches thick. The subsoil is about 36 inches thick. It is mostly brown and strong brown gravelly or very cobbly clay loam. The substratum to a depth of 63 inches is strong brown and dark yellowish brown very gravelly or very cobbly sandy loam.

Included with this soil in mapping are small intermingled areas, generally less than 2 acres, of somewhat excessively drained Ashe soils, well drained Chester and Thurmont soils, and excessively drained Parker soils. The Ashe, Chester, and Parker soils generally are on the side slopes of surrounding ridges. The Thurmont soils are on slightly higher benches. Also included are small areas of soils that do not have stones on the surface, small areas of soils that have a very stony surface layer, and small areas of outcrops of rock. The included soils and outcrops make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Runoff is rapid. The hazard of erosion is severe. The natural fertility is medium, and the organic matter content is high. The subsoil has low shrink-swell

potential. The root zone extends to a depth of more than 40 inches. The surface layer and subsoil are strongly acid or medium acid, unless limed. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are in woodland. A few areas are in pasture or orchards.

This soil is not suited to cultivated crops. The stones on the surface and steep slope make the use of tillage equipment impractical.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes and overgrazing are major management concerns. Proper stocking rates to maintain desirable grasses and legumes, controlled grazing, and use of lime and fertilizer according to soil tests are useful in pasture management. If the pasture is overgrazed, runoff and soil losses by erosion are excessive.

Potential productivity for trees on this soil is high. The soil is managed for mixed hardwoods and pines. Thinning stands for rapid growth, clear cutting, replanting with fast-growing species, and removal of insect- or disease-infected trees help to increase timber production. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion.

Slope and moderately permeable subsoil are the main limitations for nonfarm uses. They limit sanitary facilities, building sites, and recreational areas. This soil is limited for use as a source of roadfill because of the depth to rock, excess fines, and the slope.

This soil is in capability subclass VI<sub>s</sub>.

**88—Udorthents, loamy.** This map unit is made up of areas that have been used for cutting or filling during grading for roads, housing developments, recreational areas, quarries, and other similar uses. The areas commonly are irregular in shape and conform to property boundaries. They range from 3 to about 50 acres. Slopes mainly range from 2 to about 25 percent. Sidewalls are nearly vertical in places.

The cuts are generally the steepest part of this map unit. The material exposed in these cuts is generally loamy and is very strongly acid. It generally consists of underlying material of the Ashe, Catocin, Chester, Cullen, Elioak, Hayesville, Manteo, Myersville, Nason, or Rabun soils. The filled areas generally consist of material removed from the cuts.

Included with these soils in mapping are areas of soils that have not been appreciably altered by cutting and filling and areas where bedrock is exposed. These areas make up less than 15 percent of mapped areas.

Permeability ranges from moderately rapid to slow. The available water capacity is low to moderate. Surface runoff is medium to very rapid, and the hazard of erosion is moderate to very severe. The organic matter content and the natural fertility are low. These soils are medium acid to very strongly acid throughout. Water stands in

some areas during winter and spring, or throughout the year.

Areas of these soils commonly are covered by a thin stand of brush, grasses, and annual weeds. Some smoothed areas are farmed.

Onsite investigations are needed to determine the use and management of these soils.

These soils are not assigned to a capability subclass.

**89B—Unison silt loam, 2 to 7 percent slopes.** This deep, gently sloping, well drained soil is on broad colluvial fans and mountain foot slopes. Slopes are smooth, simple, and about 300 to 600 feet long. Areas of this soil commonly are elongated or irregularly rectangular. They are 5 to about 20 acres.

Typically, the surface layer is dark brown silt loam about 6 inches thick. The subsoil is about 52 inches thick. It is reddish brown and yellowish red silty clay loam and clay. The substratum to a depth of 60 inches or more is strong brown cobbly clay loam.

Included with this soil in mapping are small intermingled areas, generally less than 3 acres, of well drained Braddock, Dyke, Lew, and Thurmont soils. The Braddock, Dyke, and Thurmont soils are throughout the mapped area. The Lew soils generally are closer to the base of the mountains than Unison soils. Also included are small areas of soils that have a very stony surface layer and of severely eroded soils that have a silty clay loam surface layer. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Runoff is medium. The hazard of erosion is moderate. This soil has good tilth and can be easily tilled in the proper range of soil moisture. The natural fertility is medium, and the organic matter content is low to moderate. The subsoil is plastic and has moderate shrink-swell potential. The root zone extends to a depth of about 40 inches or more. The surface layer and subsoil commonly are strongly acid or medium acid, unless limed. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are farmed. A few areas are in pasture.

This soil is well suited to cultivated crops. The hazard of erosion is moderate but is a major management concern. Other management concerns are increasing the organic matter content and applying lime and fertilizer according to soil tests to offset acidity and improve fertility. In cultivated cropland, conservation tillage and legumes in the cropping system help reduce runoff and control erosion. Crop residue should be kept on or near the surface.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes and overgrazing are major pasture management concerns. Proper stocking rates to maintain desirable grasses and legumes, controlled grazing, and the use of

lime and fertilizer according to soil tests are useful in pasture management. If the pasture is overgrazed, runoff is increased and soil losses by erosion are excessive.

Potential productivity for trees on this soil is very high. The soil is managed for hardwoods and pines. Seeds and seedlings survive and grow well if competing vegetation is controlled.

Low strength, moderate permeability, moderate shrink-swell potential, and clayey subsoil are the main limitations for nonfarm uses. Low strength limits the use of this soil as a source of roadfill and for local roads and streets. The moderately permeable, clayey subsoil limits some sanitary facilities. The clayey subsoil and moderate shrink-swell potential limit building site development. Slope is a limitation for playgrounds.

This soil is in capability subclass IIe.

**89C—Unison silt loam, 7 to 15 percent slopes.** This deep, strongly sloping, well drained soil is on convex side slopes of colluvial fans and mountain foot slopes. Slopes are smooth, simple, and about 300 to 600 feet long. Areas of this soil commonly are elongated or irregularly rectangular. They are 5 to about 20 acres.

Typically, the surface layer is dark brown silt loam about 6 inches thick. The subsoil is about 52 inches thick. It is yellowish red silty clay loam and reddish brown clay. The substratum to a depth of 60 inches or more is strong brown cobbly clay loam.

Included with this soil in mapping are small intermingled areas, generally less than 3 acres, of well drained Braddock, Dyke, Lew, and Thurmont soils. The Braddock, Dyke, and Thurmont soils are throughout the mapped area. The Lew soils generally are closer to the base of the mountains than Unison soils. Also included are small areas of soils that have a very stony surface layer and small areas of severely eroded soils that have a silty clay loam surface layer. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Runoff is rapid. The hazard of erosion is severe. This soil has good tilth and can be easily tilled in the proper range of soil moisture. The natural fertility is medium, and the organic matter content is low to moderate. The subsoil is plastic and has moderate shrink-swell potential. The root zone extends to a depth of about 40 inches or more. The surface layer and subsoil commonly are strongly acid or medium acid, unless limed. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are farmed. A few areas are in pasture.

This soil is moderately well suited to cultivated crops. The hazard of erosion is severe and is a major management concern. Other management concerns are increasing the organic matter content and applying lime and fertilizer according to soil tests to offset the acidity and improve the fertility. If the soil is cultivated,

conservation tillage, use of cover crops, and including grasses and legumes in the cropping system help reduce runoff and control erosion. Crop residue should be kept on or near the surface.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes and overgrazing are major pasture management concerns. Proper stocking rates to maintain desirable grasses and legumes, controlled grazing, and the use of lime and fertilizer according to soil tests are useful in pasture management. If the pasture is overgrazed, runoff is increased and soil losses by erosion are excessive.

Potential productivity for trees on this soil is very high. The soil is managed for hardwoods and pines. Seeds and seedlings survive and grow well if competing vegetation is controlled.

Low strength, moderate permeability, slope, moderate shrink-swell potential, and clayey subsoil are the main limitations for nonfarm uses. Low strength limits the use of this soil as a source of roadfill and for local roads and streets. The moderately permeable, clayey subsoil and slope limit the use of this soil for sanitary facilities. The clayey subsoil, slope, and moderate shrink-swell potential are limitations for building site development. Slope is a limitation for recreational development.

This soil is in capability subclass IIIe.

**90B—Unison very stony silt loam, 2 to 7 percent slopes.** This deep, gently sloping, well drained soil is on broad colluvial fans and mountain foot slopes. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Slopes are smooth, simple, and about 300 to 600 feet long. Areas of this soil commonly are elongated or irregularly rectangular. They are 5 to about 100 acres.

Typically, the surface layer is dark brown silt loam about 6 inches thick. The subsoil is about 52 inches thick. It is yellowish red silty clay loam and reddish brown clay. The substratum to a depth of 60 inches is strong brown cobbly clay loam.

Included with this soil in mapping are small intermingled areas, generally less than 3 acres, of well drained Braddock, Dyke, Lew, and Thurmont soils. The Braddock, Dyke, and Thurmont soils are throughout the mapped area. The Lew soils generally are closer to the base of the mountains than Unison soils. Also included are small areas of soils that do not have stones on the surface and small areas of severely eroded soils that have a silty clay loam surface layer. Included soils make up about 20 percent of mapped areas.

Permeability and available water capacity are moderate. Runoff is medium. The hazard of erosion is moderate. The natural fertility is medium, and the organic matter content is low to moderate. The subsoil is plastic and has moderate shrink-swell potential. The root zone extends to a depth of about 40 inches or more. The surface layer and subsoil commonly are strongly acid or

medium acid, unless limed. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are in pasture. A few areas are in woodland.

This soil is not suited to hay and cultivated crops. The stones on the surface make the use of modern equipment impractical.

This soil is moderately well suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes and overgrazing are major pasture management concerns. Proper stocking rates to maintain desirable grasses and legumes, controlled grazing, and applying lime and fertilizer according to soil tests are useful in pasture management. If the pasture is overgrazed, runoff is increased and soil losses by erosion are excessive.

Potential productivity for trees on this soil is very high. The soil is managed for hardwoods and pines. Seeds and seedlings survive and grow well if competing vegetation is controlled.

Low strength, stoniness, moderate shrink-swell potential, and clayey, moderately permeable subsoil are the main limitations for nonfarm uses. Low strength limits the use of this soil as a source of roadfill and for local roads and streets. The clayey, moderately permeable subsoil limits some sanitary facilities. The moderate shrink-swell potential and the clayey subsoil limit use of this soil for building site development. Stoniness is a limitation for most recreational development.

This soil is in capability subclass VI<sub>s</sub>.

**90C—Unison very stony silt loam, 7 to 15 percent slopes.** This deep, strongly sloping, well drained soil is on convex side slopes of colluvial fans and mountain foot slopes. Stones, 3 to 10 feet apart, cover about 3 to 15 percent of the surface. Slopes are smooth and about 300 to 600 feet long. Areas of this soil commonly are long and winding. They range from 3 to about 20 acres.

Typically, the surface layer of this soil is dark brown silt loam about 6 inches thick. The subsoil is about 52 inches thick. It is yellowish red silty clay loam and reddish brown clay. The substratum to a depth of 60 inches or more is strong brown cobbly clay loam.

Included with this soil in mapping are small intermingled areas, generally less than 3 acres, of well drained Braddock, Dyke, Lew, and Thurmont soils. The Braddock, Dyke, and Thurmont soils are throughout the mapped area. The Lew soils generally are closer to the base of the mountains than Unison soils. Also included are small areas of soils that do not have stones on the surface layer. Included soils make up about 25 percent of mapped areas.

Permeability and available water capacity are moderate. Runoff is rapid. The hazard of erosion is severe. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of about 40 inches or more. The organic matter content is low to moderate, and the natural fertility is medium. This soil commonly is

strongly acid or medium acid throughout, but reaction in the surface layer is variable because of local liming. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are in woodland. Some areas are in pasture.

This soil is not suited to hay and cultivated crops. The stones on the surface make the use of modern equipment impractical.

This soil is moderately well suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is very high. The soil is managed for pines and hardwoods. Seeds and seedlings survive and grow well if competing vegetation is controlled.

Slope, low strength, stoniness, moderate shrink-swell potential, and moderately permeable clayey subsoil are the main limitations for nonfarm uses. Slope, moderate shrink-swell potential, and low strength limit use of this soil as a building site. The clayey, moderately permeable subsoil and slope limit the soil as a site for sanitary facilities. Slope and stoniness limit recreational areas. Low strength and excess fines limit use of this soil as a source of roadfill.

This soil is in capability subclass VI<sub>s</sub>.

**90D—Unison very stony silt loam, 15 to 25 percent slopes.** This deep, moderately steep, well drained soil is on convex side slopes of colluvial fans and mountain foot slopes. Stones, 3 to 10 feet apart, cover 3 to 15 percent of the surface. Slopes are smooth, simple, and about 200 to 400 feet long. Areas of this soil are long and winding. They range from 3 to about 20 acres.

Typically, the surface layer is dark brown silt loam about 6 inches thick. The subsoil is about 52 inches thick. It is yellowish red silty clay loam and reddish brown clay. The substratum to a depth of 60 inches or more is strong brown cobbly clay loam.

Included with this soil in mapping are small intermingled areas, generally less than 3 acres, of well drained Braddock, Dyke, Lew, and Thurmont soils. The Braddock, Dyke, and Thurmont soils are throughout the mapped area. The Lew soils generally are closer to the base of the mountains than Unison soils. Also included are small areas of soils that do not have stones on the surface and small areas of severely eroded soils that have a silty clay loam surface layer. Included soils make up about 25 percent of mapped areas.

Permeability and available water capacity are moderate. Runoff is rapid. The hazard of erosion is severe. Natural fertility is medium, and organic matter content is low to moderate. The subsoil is plastic and has moderate shrink-swell potential. The root zone

extends to a depth of 40 inches or more. The surface layer and subsoil commonly are strongly acid or medium acid, unless limed. Bedrock is generally at a depth of more than 5 feet.

Most areas of this soil are in woodland. A few areas are in pasture.

This soil is not suited to hay and cultivated crops. The use of tillage equipment is impractical because of the stones on the surface.

This soil is moderately well suited to pasture crops. Establishing and maintaining a mixture of grasses and legumes and overgrazing are major pasture management concerns. Proper stocking rates to maintain desirable grasses and legumes, controlled grazing, and use of lime and fertilizer according to soil tests are useful in pasture management. If the pasture is overgrazed, runoff is increased and soil losses by erosion are excessive.

Potential productivity for trees on this soil is very high. The soil is managed for hardwoods and pines. Seeds and seedlings survive and grow well on this soil. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits the safe operation of heavy equipment.

Slope, clayey, moderately permeable subsoil, stoniness, and low strength are limitations for most nonfarm uses. Slope and the clayey, moderately permeable subsoil limit this soil for most sanitary facilities. Low strength limits the use of this soil as a source of roadfill and local streets and roads. Slope is a limitation for building site development. Slope and stoniness are limitations for recreational development.

This soil is in capability subclass VI.

**91—Urban land.** This map unit consists of areas where more than 80 percent of the surface is covered by asphalt, concrete, buildings, or other impervious surfaces. These areas are parking lots, shopping centers, business centers, industrial parks, school complexes, and airports. These areas are throughout Albemarle County but dominantly are around the city of Charlottesville. They are on the Piedmont and generally range from 2 to more than 10 acres. Slopes range from 0 to 10 percent.

This map unit is not assigned to a capability subclass.

**92—Wahee silt loam.** This soil is deep, nearly level, and somewhat poorly drained. It is on narrow to broad, low stream terraces. Areas of this soil commonly are irregularly elongated. They range from about 3 to 50 acres. Slopes range from 0 to 4 percent.

Typically, the surface layer of this soil is dark grayish brown and grayish brown silt loam about 9 inches thick. The subsoil is mottled and extends to a depth of 60 inches. It is mostly light yellowish brown clay loam in the upper part and mottled gray clay and clay loam in the lower part.

Included with this soil in mapping are small areas of moderately well drained Dogue soils, well drained McQueen soils, and poorly drained Wehadkee soils. The Dogue and McQueen soils are on the slightly higher convex positions throughout the mapped area, and the Wehadkee soils are around small drainageways and in depressions. Also included are areas of soils that are similar to this Wahee soil, have a thinner subsoil and are generally along slope breaks. Included soils make up about 20 percent of mapped areas.

Permeability is slow, and available water capacity is moderate. Surface runoff is slow. The hazard of erosion is slight. This soil has good tilth. The surface layer is friable and easily tilled. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content and the natural fertility are low to high. This soil commonly is very strongly acid or strongly acid throughout, but reaction in the surface layer is variable because of local liming. A seasonal high water table is at a depth of 1/2 foot to 1 1/2 feet during winter and early in spring. Areas are subject to occasional flooding. Depth to bedrock is more than 5 feet.

Most areas of this soil are in permanent pasture. Some areas are in woodland, and some areas are farmed.

This soil is moderately well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. The soil is wet and cold in spring, and wetness commonly interferes with tillage. Drainage helps to alleviate wetness and protects crops from damage. Conservation tillage, using cover crops, grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, using proper stocking rates, controlled grazing, drainage, and use of lime and fertilizer according to soil tests help to increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface layer and reduces plant growth and infiltration.

The potential productivity for trees on this soil is high, especially for loblolly pine, sweetgum, yellow-poplar, and oaks. Seeds and seedlings survive and grow well only if competing vegetation is controlled. The soil is soft when wet and limits the use of heavy equipment.

The seasonal high water table, occasional flooding, and slowly permeable clayey subsoil are the main limitations for nonfarm uses, especially for building sites, sanitary landfills, and septic tank absorption fields. The high water table is a limitation for recreational development. Low strength and excess fines limit use of this soil as a source of roadfill.

This soil is in capability subclass IIIw.

**93C—Watt channery silt loam, 7 to 15 percent slopes.** This moderately deep, strongly sloping, somewhat excessively drained soil is on convex ridgetops and the upper part of side slopes. Slopes are smooth and about 200 to 600 feet long. Areas of this soil commonly are long and narrow. They range from 3 to about 20 acres.

Typically, the surface layer of this soil is very dark gray and dark olive gray channery silt loam about 10 inches thick. The subsoil is olive gray very channery silt loam about 8 inches thick. The substratum to a depth of about 28 inches is multicolored olive gray, black, and light olive brown very channery silt loam. Graphitic schist is at a depth of about 28 inches.

Included with this soil in mapping are small areas of well drained Albemarle and Glenelg soils and excessively drained Hazel soils. These soils are throughout the mapped areas. Included soils make up about 20 percent of mapped areas.

Permeability is moderately rapid, and the available water capacity is very low. Surface runoff is rapid. The hazard of erosion is severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of about 20 inches. The organic matter content and the natural fertility are low. This soil is very strongly acid throughout. Depth to bedrock ranges from 20 to 40 inches.

Most areas of this soil are in woodland.

This soil is poorly suited to cultivated crops. It is droughty during the growing season. The severe hazard of erosion is a major management concern. Conservation tillage, using cover crops, grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth, reduce crusting, and increase water infiltration.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, weed control, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture and help to control erosion. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderate. Virginia pine and oaks do fair on this soil. The survival of seeds and seedlings is affected by drought during the growing season. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. Limited depth to bedrock causes windthrow in many places.

The slope and the shallow depth to bedrock are the main limitations for nonfarm uses. Depth to bedrock limits use of the soil as a building site and for sanitary facilities. Slope limits use of the soil for recreational areas. The soil is a poor source of roadfill.

This soil is in capability subclass IVe.

**93D—Watt channery silt loam, 15 to 25 percent slopes.** This moderately deep, moderately steep, somewhat excessively drained soil is on narrow, convex ridgetops and convex side slopes. Slopes are smooth and about 200 to 600 feet long. Areas of this soil commonly are long and narrow. They are about 5 to 20 acres.

Typically, the surface layer of this soil is very dark gray and dark olive gray channery silt loam about 10 inches thick. The subsoil is olive gray very channery silt loam about 8 inches thick. The substratum to a depth of about 28 inches is multicolored olive gray, black, and light olive brown very channery silt loam. Graphitic schist is at a depth of about 28 inches.

Included with this soil in mapping are small areas of well drained Albemarle and Glenelg soils and excessively drained Hazel soils. The Albemarle and Glenelg soils are on the ridgetops. The Hazel soils are throughout the mapped area. Included soils make up about 20 percent of mapped areas.

Permeability is moderately rapid, and available water capacity is very low. Surface runoff is rapid. The hazard of erosion is severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of about 20 inches. The organic matter content and the natural fertility are low. This soil is very strongly acid throughout. Depth to bedrock ranges from 20 to 40 inches.

Most areas of this soil are in woodland.

This soil is not suited to cultivated crops. It is droughty during the growing season.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, the use of proper stocking rates, controlled grazing, weed control, and the use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture and help to control erosion. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderate. This soil is fairly suited to Virginia pine and oaks. The survival of seeds and seedlings is affected by drought during the growing season. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits safe operation of heavy equipment. Limited depth to bedrock causes windthrow in many places.

The slope and shallow depth to bedrock are the main limitations for nonfarm uses. Slope and depth to bedrock limit use of this soil as a building site and for most sanitary facilities. Slope limits use of the soil for recreational areas. The soil is a poor source of roadfill.

This soil is in capability subclass VIe.

**93E—Watt channery silt loam, 25 to 45 percent slopes.** This moderately deep, steep, somewhat excessively drained soil is on side slopes in the

Piedmont. Areas of this soil are commonly long and narrow. They are 3 to about 20 acres.

Typically, the surface layer of this soil is very dark gray and dark olive gray channery silt loam about 7 inches thick. The subsoil is olive gray channery silt loam about 11 inches thick. The substratum to a depth of about 28 inches is multicolored olive, gray, black, and light olive brown channery silt loam. Graphitic schist is at a depth of about 32 inches.

Included with this soil in mapping are small areas of excessively drained Hazel soils. These soils are throughout the mapped area. Also included are small areas of soils that have a flaggy or stony surface layer. Included soils make up about 20 percent of mapped areas.

Permeability is moderate to moderately rapid, and available water capacity is very low. Surface runoff is very rapid. The hazard of erosion is very severe. The subsoil has low shrink-swell potential. The root zone extends to a depth of about 20 inches. The organic matter content and the natural fertility are low. This soil is extremely acid or very strongly acid throughout. Depth to bedrock ranges from 20 to 40 inches.

Most areas of this soil are in woodland.

This soil is not suited to hay and cultivated crops. The steep slope makes use of modern equipment impractical.

This soil is poorly suited to pasture. It is droughty during the growing season. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, rotation of pasture, and deferred grazing help to increase the carrying capacity of pasture and help to control erosion. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderate. This soil is fairly suited to Virginia pine and oaks. The survival of seeds and seedlings is affected by drought during the growing season. Logging roads and skid trails should be constructed on the contour to reduce the concentration of runoff and help control erosion. The slope limits safe operation of heavy equipment. Limited depth to bedrock causes windthrow in many places.

The slope and shallow depth to bedrock are the main limitations for nonfarm uses. Slope and depth to bedrock limit use of this soil for building sites, septic tank absorption fields, and sanitary landfills. Slope is a limitation for recreational areas. This soil is a poor source of roadfill.

This soil is in capability subclass VIe.

#### **94B—Wedowee sandy loam, 2 to 7 percent slopes.**

This deep, gently sloping, well drained soil is on narrow to broad, convex ridgetops. Areas of this soil commonly are irregularly rounded or oblong. They range from 3 to about 20 acres.

Typically, the surface layer of this soil is dark yellowish brown sandy loam about 7 inches thick. The subsoil is mostly yellowish brown and yellowish red clay, sandy

clay loam, and clay loam about 23 inches thick. The substratum, to a depth of 42 inches, is strong brown, yellowish brown, and white sandy clay loam. From 42 to more than 60 inches is strongly weathered granite rock that crushes easily to sandy clay loam.

Included with this soil in mapping are small areas of well drained to excessively drained Louisburg soils and well drained Pacolet soils. The Louisburg soils are mainly on the more sloping positions and points of ridges. The Pacolet soils are throughout the mapped area. Also included are small areas of gravelly soils, and small areas of severely eroded soils that have a strong brown sandy clay loam or clay loam surface layer. Included soils make up about 20 percent of mapped areas.

Permeability is moderate, and available water capacity is low. Surface runoff is medium. The hazard of erosion is moderate. This soil has good tilth. The surface layer is friable and easily tilled when moist. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 30 inches or more. The organic matter content and the natural fertility are low. This soil commonly is strongly acid or very strongly acid throughout, but reaction in the surface layer is variable because of local liming. The depth to bedrock is more than 60 inches.

Most areas of this soil are farmed. Some areas are in woodland or pasture, and a few areas are in urban development.

This soil is well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain the organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high, especially for loblolly pine, Virginia pine, yellow-poplar, and oaks. Seeds and seedlings survive and grow well if competing vegetation is controlled.

Low strength, moderate shrink-swell potential, and moderately permeable, clayey subsoil are the main limitations for nonfarm uses. The low strength and the shrink-swell potential limit use of this soil as a building site, and the clayey subsoil limits excavations. The moderately permeable subsoil is a limitation for septic tank absorption fields. Low strength and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass IIe.

**94C—Wedowee sandy loam, 7 to 15 percent slopes.** This deep, strongly sloping, well drained soil is on narrow convex ridgetops and side slopes. Areas of this soil commonly are irregularly oblong. They range from 3 to about 20 acres.

Typically, the surface layer of this soil is dark yellowish brown sandy loam about 7 inches thick. The subsoil is mostly yellowish brown and yellowish red clay, sandy clay loam, and clay loam about 23 inches thick. The substratum, to a depth of 42 inches, is strong brown, yellowish brown, and white sandy clay loam. From 42 to more than 60 inches is strongly weathered granite rock that crushes easily to sandy clay loam.

Included with this soil in mapping are small areas of somewhat excessively drained Louisburg soils and well drained Pacolet soils. The Louisburg soils are mainly on the more sloping positions and points of ridges. The Pacolet soils are throughout the mapped area. Also included are small areas of gravelly soils and small areas of severely eroded soils that have a strong brown sandy clay loam or clay loam surface layer. Included soils make up about 20 percent of mapped areas.

Permeability is moderate, and available water capacity is low. Surface runoff is rapid. The hazard of erosion is severe. The surface layer is friable and easily tilled when moist but breaks up into clods if tilled when the soil is too wet or too dry. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 30 inches or more. The organic matter content and the natural fertility are low. This soil commonly is strongly acid or very strongly acid, but reaction in the surface layer is variable because of local liming. The depth to bedrock is more than 60 inches.

Most areas of this soil are in permanent pasture. Some areas are in woodland, and a few areas are in urban development.

This soil is moderately well suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. Conservation tillage, use of cover crops, including grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain the organic matter content and tilth and help to control erosion, reduce crusting, and increase water infiltration.

This soil is well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, use of proper stocking rates, controlled grazing, and use of lime and fertilizer according to soil tests help increase the carrying capacity of pasture. Overgrazing causes compaction of the surface soil and increases runoff and erosion.

Potential productivity for trees on this soil is moderately high, especially for loblolly pine, Virginia pine, yellow-poplar, and oaks. Seeds and seedlings survive and grow well if competing vegetation is controlled.

Slope, low strength, moderate shrink-swell potential, and moderately permeable clayey subsoil are the main

limitations for nonfarm uses. Slope, low strength, and shrink-swell potential limit use of this soil as a building site, and the clayey subsoil limits excavations. Slope and the moderately permeable subsoil limit septic tank absorption fields and recreational areas. Low strength and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass IIIe.

**95—Wehadkee silt loam.** This soil is deep, nearly level, and poorly drained. It is on narrow to broad flood plains. Slopes range from 0 to 2 percent. Areas of this soil commonly are long and narrow. They range from about 5 to 20 acres.

Typically, the surface layer of this soil is grayish brown silt loam about 10 inches thick. The subsoil is mottled and extends to a depth of 52 inches. It is mostly dark gray or gray silty clay loam or silt loam. The substratum to a depth of 62 inches is gray sandy loam and has dark yellowish brown mottles.

Included with this soil in mapping are small areas of somewhat poorly drained Chewacla soils and well drained Riverview soils. The Chewacla and Riverview soils are on slightly higher convex positions throughout the landscape. Also included are small areas of soils that have a clayey subsoil and of soils that have slopes of more than 2 percent. These soils are generally farthest away from the stream near the base of upland ridges. Included soils make up about 20 percent of mapped areas.

Permeability is moderate, and available water capacity is high. Surface runoff is slow. The hazard of erosion is slight. The surface layer is friable, and tilth is good. The subsoil has low shrink-swell potential. The root zone extends to a depth of less than 36 inches. The organic matter content is moderate, and the natural fertility is medium. This soil commonly is strongly acid to slightly acid throughout, but reaction in the surface layer is variable because of local liming. The depth to bedrock is more than 5 feet. A seasonal high water table is within a depth of 2 1/2 feet during winter and early in spring. Areas of this soil are subject to occasional flooding.

Most areas of this soil are in woodland, but some areas are in pasture.

This soil is poorly suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. The soil is wet and cold in spring, and wetness commonly interferes with tillage. Drainage helps to alleviate wetness and protects crops from damage. Conservation tillage, using cover crops and grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth, reduce crusting, and increase water infiltration.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, using proper stocking rates, controlled

grazing, drainage, and lime and fertilizer applied according to soil tests help to increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface layer, reduces plant growth, and reduces infiltration.

The potential productivity for trees on this soil is very high, especially for loblolly pine, sweetgum, yellow-poplar, sycamore, and willow oak. Seeds and seedlings survive and grow well if competing vegetation is controlled. The soil is soft when wet. This limits the use of heavy equipment.

The seasonal high water table and occasional flooding are the main limitations of this soil for nonfarm uses. They especially limit use of this soil for building sites, for most sanitary facilities, and for recreational development. Wetness and excess fines limit use of the soil as a source of roadfill.

This soil is in capability subclass IVw.

**96B—Worsham loam, 2 to 7 percent slopes.** This soil is deep, gently sloping, and poorly drained. It is in depressions, at the heads of drains, and along intermittent streams. Areas of this soil commonly are irregularly elongated. They range from about 3 to 15 acres.

Typically, the surface layer of this soil is dark grayish brown and grayish brown loam about 9 inches thick. The subsoil is about 45 inches thick. It is mostly light gray clay and is mottled. The substratum to a depth of 60 inches or more is light gray sandy clay loam.

Included with this soil in mapping are small areas of moderately well drained Abell soils, somewhat poorly drained Belvoir soils, moderately well drained to somewhat poorly drained Lignum soils, and moderately well drained to well drained Meadowville soils. The Abell and Meadowville soils are on slightly higher convex positions near the base of upland ridges. The Belvoir and Lignum soils are on slightly higher convex positions throughout the landscape. Also included are small areas of soils that have slopes of more than 7 percent. Included soils make up about 25 percent of mapped areas.

Permeability is slow to very slow, and available water capacity is moderate. Surface runoff is medium. The hazard of erosion is moderate. The surface layer is friable, but tilth is poor. The subsoil has moderate shrink-swell potential. The root zone extends to a depth of 40 inches or more. The organic matter content is low to moderate, and the natural fertility is low. This soil commonly is very strongly acid or strongly acid throughout, but reaction in the surface layer is variable because of local liming. A seasonal high water table is within a depth of 1 foot during winter and spring.

Most areas of this soil are in permanent pasture, but some areas are in woodland.

This soil is poorly suited to cultivated crops. When lime and fertilizer are applied according to soil tests, crops respond well. The soil is wet and cold in spring, and wetness commonly interferes with tillage. Drainage helps to alleviate wetness and protects crops from damage. Conservation tillage, cover crops, grasses and legumes in the cropping system, and returning crop residue to the soil help to maintain organic matter content and tilth, reduce crusting, and increase water infiltration.

This soil is moderately well suited to pasture and hay crops. Establishing and maintaining a mixture of grasses and legumes, using proper stocking rates, controlled grazing, drainage, and lime and fertilizer applied according to soil tests help to increase the carrying capacity of pasture. Overgrazing or grazing when the soil is too wet causes compaction of the surface layer, reduces plant growth, and reduces infiltration.

The potential productivity for trees on this soil is high, especially for loblolly pine, sweetgum, yellow-poplar, and oaks. Seeds and seedlings survive and grow well if competing vegetation is controlled. The soil is soft when wet. This limits the use of heavy equipment.

The seasonal high water table and the clayey, slowly permeable subsoil are the main limitations of this soil for nonfarm uses. They especially limit use of this soil for building sites, for most sanitary facilities, and for recreational development. Wetness, low strength, and excess fines limit use of this soil as a source of roadfill.

This soil is in capability subclass IVw.

# Accessibility Statement

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