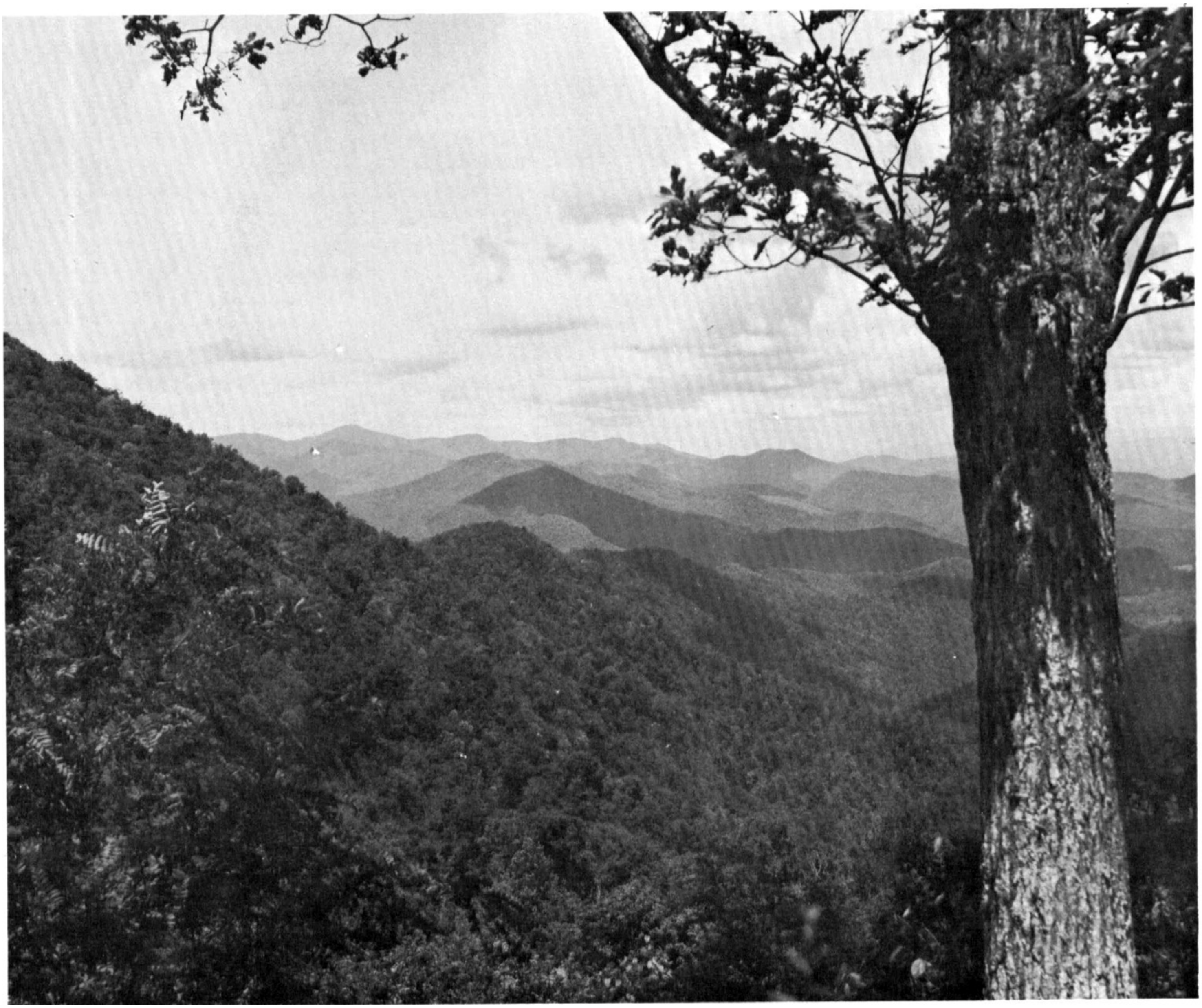
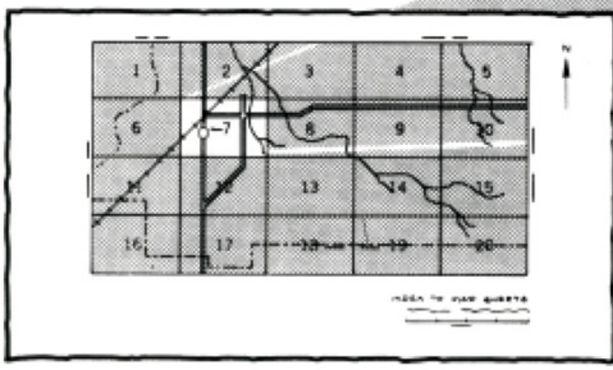


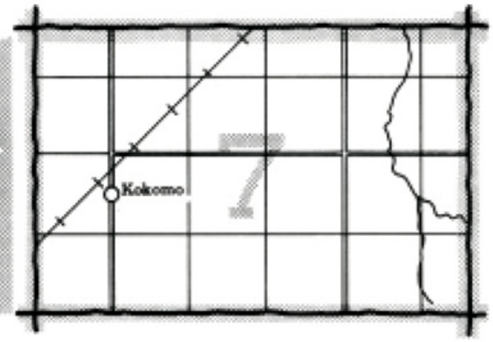
SOIL SURVEY OF RABUN AND TOWNS COUNTIES GEORGIA

United States Department of Agriculture
Soil Conservation Service and Forest Service
in cooperation with the
University of Georgia
College of Agricultural Experiment Stations

HOW TO USE

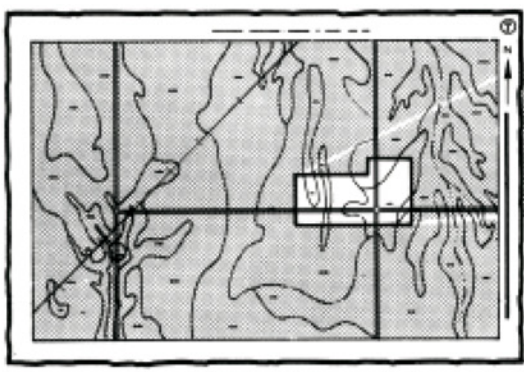
1. Locate your area of interest on the "Index to Map Sheets"

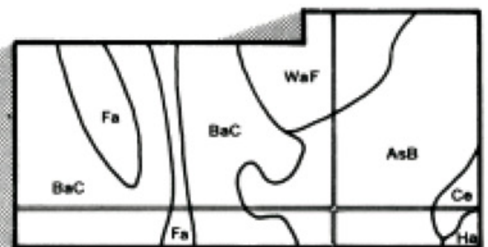




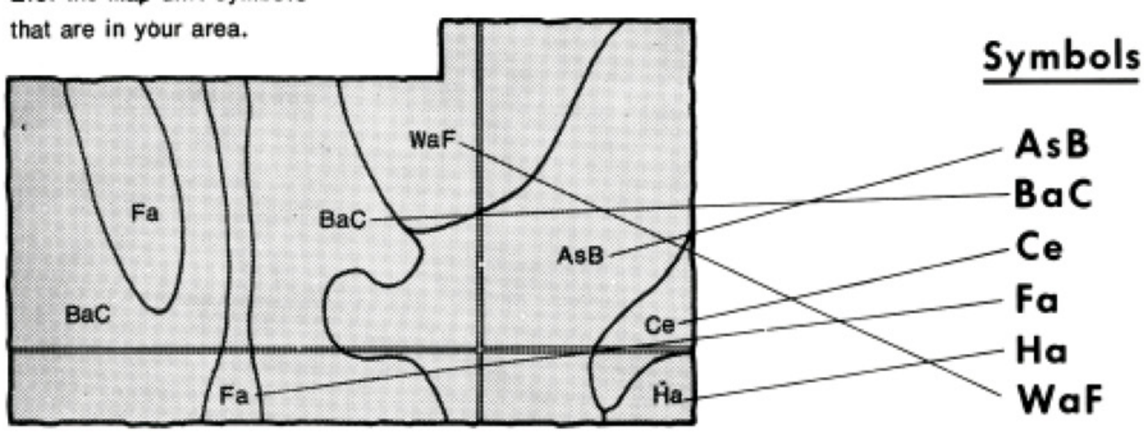
2. Note the number of the map sheet and turn to that sheet.

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



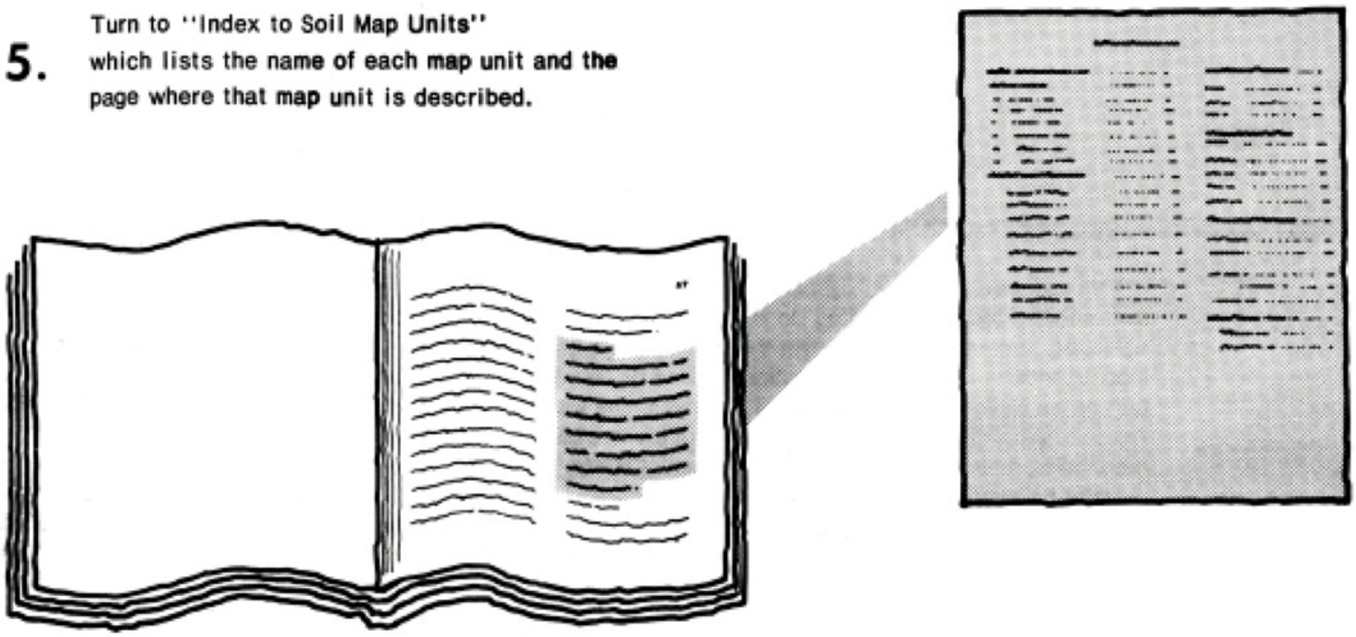


4. List the map unit symbols that are in your area.

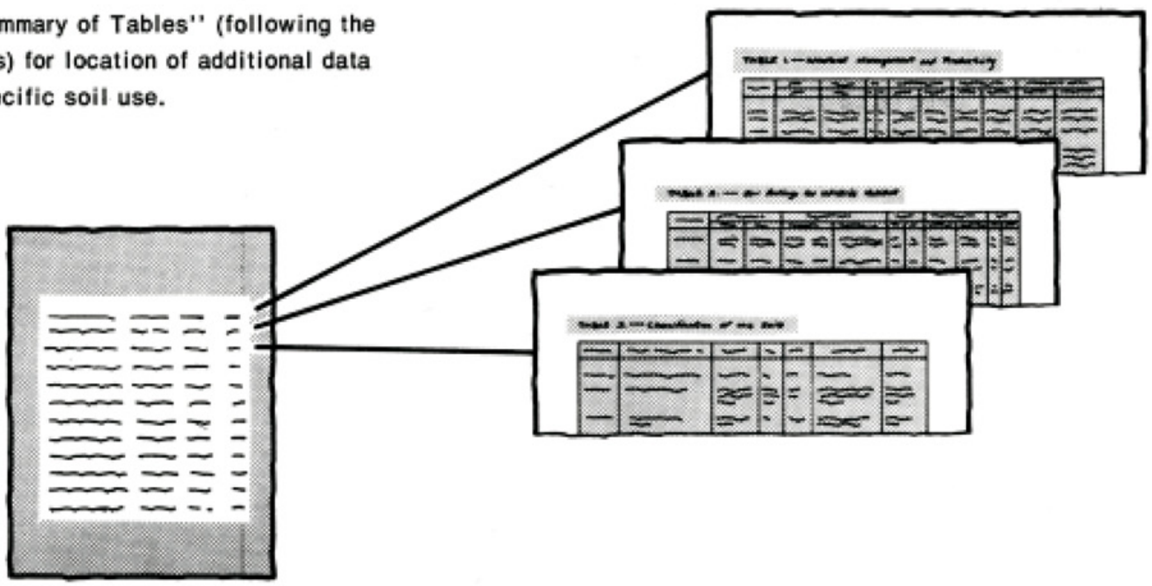


THIS SOIL SURVEY

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



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



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

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

Major fieldwork for this soil survey was completed in the period 1969-75. Soil names and descriptions were approved in 1976. Unless otherwise indicated, statements in the publication refer to conditions in the survey area in 1977. This survey was made cooperatively by the Soil Conservation Service, the Forest Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations. It is part of the technical assistance furnished to the Blue Ridge Mountain Soil and Water Conservation District.

Soil maps in this survey may be copied without permission, but any enlargement of these maps can cause misunderstanding of the detail of mapping and result in erroneous interpretations. Enlarged maps do not show small areas of contrasting soils that could have been shown at a larger mapping scale.

Cover: Briar Creek Bald is on the left and Brasstown Bald is in the background. The very steep Porters soils on the mountainsides and the steep Tusquitee and Haywood soils in the mountain coves to the right have good potential for woodland.

Contents

Issued April 1981

Index to Soil Map Units

Summary of Tables

Summary of Tables—Continued

Foreword

The Soil Survey of Rabun and Towns Counties, Georgia, contains information useful in any land-planning program. Of prime importance are the predictions of soil behavior for selected land uses. Also highlighted are limitations or hazards to land uses that are inherent in the soil, improvements needed to overcome these limitations, and the impact that selected land uses will have on the environment.

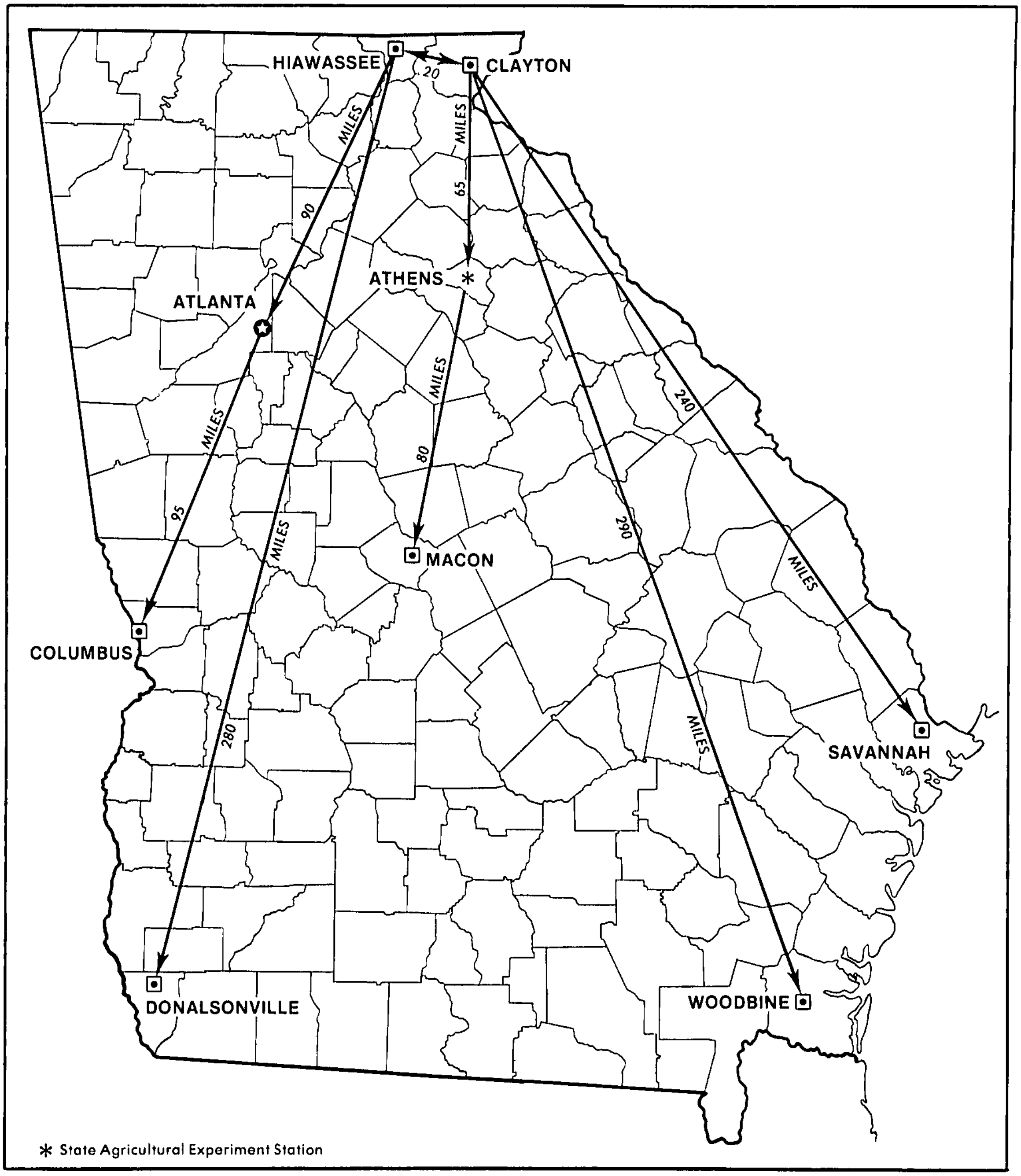
This soil survey has been prepared for many different users. Farmers, ranchers, foresters, and agronomists can use it to determine the potential of the soil and the management practices required for food and fiber production. Planners, community officials, engineers, developers, builders, and homebuyers can use it to plan land use, select sites for construction, develop soil resources, or identify any special practices that may be needed to insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the soil survey to help them understand, protect, and enhance the environment.

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

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map; the location of each kind of soil is shown on detailed soil maps. Each kind of soil in the survey area is described, and much information is given about each soil for specific uses. Additional information or assistance in using this publication can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

This soil survey can be useful in the conservation, development, and productive use of soil, water, and other resources.

Dwight M. Treadway
State Conservationist
Soil Conservation Service



Location of Rabun and Towns Counties in Georgia.

SOIL SURVEY OF RABUN AND TOWNS COUNTIES, GEORGIA

By Winfield S. Carson, Soil Conservation Service and T. W. Green, Forest Service

Fieldwork by. Winfield S. Carson and C. L. McIntyre, Soil Conservation Service; and T. W. Green and H. C. Bullock, Forest Service

United States Department of Agriculture, Soil Conservation Service and Forest Service, in cooperation with the University of Georgia, College of Agricultural Experiment Stations

RABUN AND TOWNS COUNTIES are in the northeast corner of Georgia (see map on facing page). The survey area is about 534 square miles, or 341,760 acres. Rabun County is about 368 square miles or 235,712 acres. Towns County is about 166 square miles or 106,048 acres.

Rabun and Towns Counties are in the Blue Ridge Major Land Resource Area. The survey area is bordered on the north by North Carolina, and on the east by South Carolina. Habersham and White Counties are to the south, and Union County is to the west. The southern and western boundaries are very irregular and commonly are oriented with mountain ridgetops.

The Chatooga River, which separates Georgia and South Carolina, drains the watershed in the eastern part of Rabun County. The Little Tennessee River flows north into North Carolina and drains the watershed in the north central part of Rabun County. The Tallulah River flows southeast and drains the watershed in the western part of Rabun County; it also drains an area of about 10 square miles in northeastern Towns County. Most of Towns County is drained by the Hiawassee River that flows northeast into North Carolina. About a 3-square mile area in the extreme south central part of Towns County is drained by tributaries of the Chattahoochee River.

The landscape consists of mountains and intermountain plateaus that are dissected by numerous drainageways (fig. 1). The survey area is predominantly broad gently sloping to narrow, moderately steep mountain ridgetops and moderately steep to very steep sides of mountains. Other parts of the survey area consist of gently sloping and sloping ridgetops and moderately steep hillsides on intermountain plateaus. Colluvial soils at the toe of slopes, or in coves and saddles of the mountains are common throughout the survey area. Narrow to moderately wide, nearly level flood plains are throughout the counties. They make up about 5 percent of the survey area.

Elevation of the land ranges from about 1,000 feet at Lake Tugalo to 4,784 feet above sea level on Brasstown Bald, the highest point in the State.

General nature of the counties

This section gives general information concerning the counties. It discusses climate; settlement; physiography, relief, and drainage; history and development; natural resources; and farming.

Climate

Climatic data in this section were especially prepared for the Soil Conservation Service by the National Climatic Center, Asheville, North Carolina.

In Rabun and Towns Counties in winter, valleys are very cool with occasional cold and warm spells; upper slopes and mountaintops are generally cold. In summer, valleys are very warm and frequently hot, and mountains that are warm during the day become cool at night. Precipitation is heavy and evenly distributed throughout the year. Summer precipitation falls chiefly during thunderstorms. In winter, precipitation in valleys is chiefly rain with occasional snow; in the mountains it is chiefly snow, although rains are frequent. Snow cover does not persist except at the highest elevations.

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

In winter the average temperature is 41 degrees F, and the average daily minimum temperature is 30 degrees. The lowest temperature on record, which occurred at Clayton on January 30, 1966, is -7 degrees. In summer the average temperature is 72 degrees, and the average daily maximum temperature is 84 degrees. The highest recorded temperature, which occurred on July 28, 1952, is 100 degrees.

Growing degree days, shown in table 3, are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

Of the total annual precipitation, 34 inches, or 50 percent, usually falls in April through September, which includes the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 29 inches. The heaviest 1-day rainfall during the period of record was 8.02 inches at Clayton on October 4, 1964. Thunderstorms occur on about 45 days each year, and most occur in summer.

Average seasonal snowfall is 6 inches. The greatest snow depth at any one time during the period of record was 8 inches. On the average, 1 day has at least 1 inch of snow on the ground, but the number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 90 percent. The percentage of possible sunshine is 60 in summer and 50 in winter. The prevailing wind is from the northwest. Average windspeed is highest, 9 miles per hour, in February.

Heavy rains from prolonged storms, at any time of the year, occasionally cover the area and cause severe flooding in valleys.

Settlement

Rabun County was at one time larger than it is today and was occupied by the Cherokee Indians. During 1819 to 1856 Towns County was formed from parts of Rabun and Union Counties. The first settlers came mainly from North Carolina, South Carolina, Virginia, and Pennsylvania; a few came from older settlements in Georgia. Early farming consisted of growing corn, wheat, and barley and producing cattle, hogs, chickens, and sheep for home use and for trading.

The population of the two counties was 11,994 in 1960 and 12,892 in 1970. About 15 percent of the population lives on farms.

Clayton is the largest town in the survey area and is the county seat of Rabun County. Hiawassee is the county seat of Towns County. Other towns in the survey area are Tallulah Falls, Tiger, Mountain City, Dillard, and Young Harris.

Physiography, relief, and drainage

Rabun and Towns Counties are in the Blue Ridge Land Resource Area of Georgia, a southern extension of the Appalachian Mountains. The survey area is predominantly gently sloping and sloping ridgetops and moderately steep to very steep sides of mountains and intermountain plateaus. The landscape is dissected by numerous drainageways. The ridgetops are commonly smooth and convex, and the convex sides are commonly long and uneven. Narrow to moderately wide, nearly level flood plains are along the major streams, and during winter and spring are frequently flooded.

The elevation at the junction of the Chattooga and Tallulah Rivers is about 1,000 ft. The highest elevation in the survey area is 4,784 feet above sea level on Brasstown Bald Mountain, the highest mountain in the State.

The drainage system for the two counties includes the Chattooga River, the Little Tennessee River, the Tallulah River, the Hiawassee River, Chattahoochee River, Brasstown Creek, and their associated tributaries.

The headwaters of the Chattooga River are in North Carolina. This river flows to the south and is the eastern boundary of Rabun County. The Chattooga River and its tributaries drain the eastern part of Rabun County. Important tributaries of the Chattooga River are the West Fork of the Chattooga River, Reed Creek, Warwoman Creek, Dicks Creek, Stekoa Creek, and Cliff Creek.

The headwaters of the Little Tennessee River are in the mountains north of Mountain City in Rabun County. This river and its tributaries drain the north central part of Rabun County. Important tributaries of the Little Tennessee River are Mud Creek, Kelley Creek, Darnell Creek, Blacks Creek, Keener Creek, Rickman Creek, and Bettys Creek.

The headwaters of the Tallulah River are in North Carolina. This river flows to the southeast. The Tallulah River and its tributaries drain the western part of Rabun County and a small area in the eastern part of Towns County. Important tributaries of the Tallulah River are Coleman River, Persimmon Creek, Plum Orchard Creek, Popcorn Creek, Timpson Creek, Tiger Creek, Sawmill Creek, Bridge Creek, Wildcat Creek, Moccasin Creek, and Dicks Creek in Rabun County and Charlies Creek in Towns County.

The headwaters of the Hiawassee River are in Towns County just north of the White County line. This river flows northwest into North Carolina. The Hiawassee River and its tributaries drain about three-fourths of the county. Important tributaries of the Hiawassee River are Hightower Creek, Cynth Creek, Corbin Creek, High Shools Creek, Soapstone Creek, Owl Creek, Fodder Creek, Wilson Cove Creek, and Bell Creek.

The headwaters of the Chattahoochee River are in Union County a few hundred feet from the Towns County line. This river and Henson Creek drain only a very small amount of Towns County. The headwaters of Brasstown Creek are in Union County a few hundred feet from the Towns County line. This creek and its tributaries drain about one-fifth of Towns County. Important tributaries are Crooked Creek, Corn Creek, Byers Creek, Crane Creek, Winchester Creek, and East Gumlog Creek.

Each of the tributaries of the major streams has its own small tributaries that branch into the uplands and form a well defined trellis pattern.

The upland soils are well drained or somewhat excessively drained, and the bottom lands along the major streams and their tributaries are subject to frequent overflow during winter and spring. They drain off slowly and remain wet for long periods.

History and development

The survey area lies within territory acquired by treaties with the Cherokee Indians. After the Indians left the territory, the land was distributed by lottery to the new settlers.

Rabun County was formed December 21, 1819, from original Indian territory. It was named in honor of Governor William Rabun. Clayton, the county seat, was established shortly thereafter and named in honor of Judge Augustin Smith Clayton of Athens. Judge Clayton held the first court in the county.

Most of the early settlers of Rabun County were of Scottish, English, and Irish descent. They came chiefly from early settlements in North Carolina and Virginia; some came from South Carolina and Georgia.

Towns County was formed March 6, 1856, from parts of Rabun and Union Counties. It was named in honor of Governor George W. Towns. Hiawassee, the county seat, was planned that year but was not chartered until 1870. The source of the name Hiawassee has not been authenticated, but it is thought to have been derived from an anglicized version of the Cherokee word "Ayuhwasi" or "Ayuwasi", meaning level land near a stream.

Most of the early settlers of Towns County were principally of Scotch-Irish, Welsh, and German descent. They came chiefly from early settlements in North Carolina.

The survey area has undergone several changes in land use. Commercial lumbering operations began about 1895. In 1912 a large part of the area was included in the Chattahoochee National Forest. The U. S. Forest Service manages about 195,000 acres or 57 percent of the total land area. Water areas developed by Georgia Power Company and Tennessee Valley Authority cover about 8,400 acres of the survey area.

In 1960 the population of Rabun County was 7,456. It increased to 8,327 in 1970. During this period, the population in Towns County advanced from 4,538 to 4,565.

Natural resources

Soil is the most important natural resource in the survey area. Livestock that graze these lands, timber, and agricultural crops are the marketable products derived from the soils.

Water is adequate for the towns and industries, but on most farms, springs are developed or shallow wells are dug to provide water for domestic use. These springs and wells commonly yield 3 to 8 gallons of water per minute; the wells are mostly less than 60 feet deep. Drilled wells, 6 to 8 inches in diameter and 100 to 250 feet deep, are replacing shallow wells and springs. These wells commonly yield 6 to 12 gallons of water per minute.

Large reservoirs such as Lake Burton in Rabun County and Chatuge Lake in Towns County are multipurpose facilites for hydroelectric power, flood control, and recreation. In addition, streams and farm ponds in the survey area provide water for livestock, fishing, and other recreational activities.

Farming

The first settlers of Rabun and Towns Counties were farmers. Early farming consisted of growing corn, wheat, and barley and producing cattle, hogs, chickens, and sheep for home use and for trading. Fields were enclosed with rail fences and livestock had open range. Fruits and vegetables were grown for home use.

The enactment of the Soil Conservation District legislation in 1937 stirred some interest of the landowners, and on October 19, 1951, the Blue Ridge Mountain Soil and Water Conservation District was organized.

According to the U. S. Census of Agriculture, in 1969 there was 42,160 acres in farms out of a total land area of 341,760 acres. In 1969 there were 476 farms in the survey area and the average size of each farm was about 90 acres.

Most of these farms are on nearly level flood plains and gently sloping or sloping stream terraces, toe slopes, and hillsides. Most of the soils in these areas have good potential for locally grown crops. Most of the previously cultivated soils occupying moderately steep and steep slopes have been reforested or planted to pasture.

In recent years, land use has changed significantly from agricultural crops to improved pasture, planted woodland, and community development.

About 90 percent of the survey area is in mixed hardwoods and pine. Of this woodland, the U. S. Forest Service manages about 195,000 acres in the Chattahoochee National Forest. Most of the soils in the natural forest are on moderately steep to very steep mountains.

How this survey was made

Soil scientists made this survey to learn what kinds of soil are in the survey area, where they are, and how they can be used. The soil scientists went into the area knowing they likely would locate many soils they already knew something about and perhaps identify some they had never seen before. They observed the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; the kinds of native plants or crops;

the kinds of rock; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material, which has been changed very little by leaching or by the action of plant roots.

The soil scientists recorded the characteristics of the profiles they studied, and they compared those profiles with others in counties nearby and in places more distant. Thus, through correlation, they classified and named the soils according to nationwide, uniform procedures.

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

The areas shown on a soil map are called soil map units. Some map units are made up of one kind of soil, others are made up of two or more kinds of soil, and a few have little or no soil material at all. Map units are discussed in the sections "General soil maps for broad land use planning" and "Soil maps for detailed planning."

While a soil survey is in progress, samples of soils are taken as needed for laboratory measurements and for engineering tests. The soils are field tested, and interpretations of their behavior are modified as necessary during the course of the survey. New interpretations are added to meet local needs, mainly through field observations of different kinds of soil in different uses under different levels of management. Also, data are assembled from other sources, such as test results, records, field experience, and information available from state and local specialists. For example, data on crop yields under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soil.

But only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then needs to be organized so that it is readily available to different groups of users, among them farmers, managers of rangeland and woodland, engineers, planners, developers and builders, homebuyers, and those seeking recreation.

General soil maps for broad land use planning

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

The general soil maps provide a broad perspective of the soils and landscapes in the survey area. They provide a basis for comparing the potential of large areas for general kinds of land use. Areas that are, for the most part, suited to certain kinds of farming or to other land uses can be identified on the map. Likewise, areas of soils having properties that are distinctly unfavorable for certain land uses can be located.

Because of their small scale, these maps do not show the kind of soil at a specific site. Thus, they are not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The kinds of soil in any one map unit differ from place to place in slope, depth, stoniness, drainage, or other characteristics that affect their management.

The soils in the survey area vary widely in their potential for major land uses. General ratings of the potential of each map unit are given for major land uses. Soil properties that pose limitations to the use are indicated. The ratings of soil potential are based on the assumption that practices in common use in the survey area are being used to overcome soil limitations. These ratings reflect the ease of overcoming the soil limitations and the probability of soil problems persisting after such practices are used.

Each map unit is rated for *cultivated farm crops, pasture, woodland, urban uses,* and *recreation uses*. Cultivated farm crops and pasture are grown extensively by farmers in the survey area. Woodland refers to land that is producing either trees native to the area or introduced species. Urban uses include residential, commercial, and industrial developments. Recreation areas include campsites, picnic areas, ballfields, and other areas that are subject to heavy foot traffic.

Descriptions and potentials of map units in Rabun County

1. Toxaway-Transylvania-Toccoa

Deep, nearly level, very poorly drained or poorly drained, and moderately well drained or well drained soils that formed in loamy sediment; on flood plains

This map unit is made up of soils on moderately broad flood plains in valleys of mountains. The nearly level landscape is commonly expressed by low lying, very poorly drained or poorly drained areas, and by somewhat higher lying and better drained areas. Most streams are free flowing, but some are clogged by debris. In places, the stream channel has abraded to bedrock. Flooding is probable during winter and spring, and streambank erosion is a serious hazard. Slopes are less than 2 percent. Areas of this map unit are throughout Rabun County.

This map unit makes up about 4 percent of the county. It is about 49 percent Toxaway soils, 27 percent Transylvania soils, 13 percent Toccoa soils, and 11 percent soils of minor extent.

Toxaway soils are very poorly drained or poorly drained. Typically, the surface layer is black silt loam about 28 inches thick. The underlying layers extend to a depth of 60 inches or more. The upper and middle layers are very dark gray. The upper layer is silt loam, and the middle layer is loam. The lower layer is dark grayish brown loamy sand.

Transylvania soils are moderately well drained or well drained. Typically, the surface layer is about 25 inches thick. It is very dark gray in the upper part and very dark grayish brown in the lower part. The subsoil extends to a depth of 46 inches. It is brown silt loam in the upper part, dark brown silt loam mottled with strong brown in the middle part, and very dark gray silt loam mottled with strong brown in the lower part. Below this is very dark gray stratified silt loam and sand.

Toccoa soils are well drained. Typically, the surface layer is dark brown fine sandy loam about 8 inches thick. It is underlain with dark yellowish brown sandy loam to a depth of about 30 inches. Below this is dark grayish brown sandy loam to a depth of about 46 inches. The underlying material is stratified gray and brown loamy sand and extends to a depth of 62 inches or more.

The minor soils in this map unit are the Chatuge, Dillard, and Dyke soils. The poorly drained Chatuge soils commonly are on low lying stream terraces. The moderately well drained Dillard and the well drained Dyke soils commonly are on higher lying stream terraces or at the toe slopes of mountains.

The soils in this map unit are used mainly for cultivated crops and pasture, but some soils are in mixed stands of hardwoods. Most of the soils have good potential for row crops, truck crops, small grain, hay, and pasture. Wetness and flooding, however, are common management concerns.

The soils in this map unit have good potential for woodland. Wetness and flooding, however, limit use of equipment in managing and harvesting.

The soils in this map unit have poor potential for urban and most recreational uses. Wetness and flooding are primary concerns in use and management.

2. Bradson-Dyke-Dillard

Deep, gently sloping and sloping, moderately well drained or well drained soils that formed in loamy and clayey sediment; on stream terraces or colluvial areas

This map unit is made up of soils on stream terraces or in colluvial areas. Slopes are smooth and convex and range from 2 to 10 percent. Areas of this map unit are mainly in the central part of Rabun County.

This map unit makes up about 3 percent of the county. It is about 47 percent Bradson soils, 15 percent Dyke soils, 12 percent Dillard soils, and 26 percent soils of minor extent.

Bradson soils are well drained. Typically, the surface layer is brown fine sandy loam about 6 inches thick. The subsoil is red and extends to a depth of 67 inches. It is clay loam in the upper part, clay in the middle part, and clay loam in the lower part.

Dyke soils are well drained. Typically, the surface layer is dark reddish brown loam about 8 inches thick. The dark red subsoil extends to a depth of about 72 inches. It is clay loam in the upper part and clay throughout the rest of the profile.

Dillard soils are moderately well drained. Typically, the surface layer is dark grayish brown sandy loam about 8 inches thick. The subsoil is mostly mottled and extends to a depth of 55 inches. It is yellowish brown sandy clay loam in the upper part and mostly brownish yellow sandy clay loam mottled with strong brown, yellowish brown, reddish yellow, and olive yellow in the lower part. The substratum, to a depth of 66 inches, is a thin layer of light gray clay underlain by yellowish brown mudstone.

The minor soils in this map unit are Chatuge, Hayesville, and Tusquitee soils. The poorly drained Chatuge soils are on low lying stream terraces, the well drained Hayesville soils are on intermountain plateaus, and the well drained Tusquitee soils are in the same landscape together with the major soils.

The soils in this map unit are mainly used for cultivated crops and pasture, but some soils are wooded or idle. Soils have good potential for row crops, truck crops, small grain, hay, and pasture. Potential for intensive cropping is limited, unless the slopes are protected from erosion.

The soils in this map unit have good potential for woodland. However, in some places, equipment limitation is a concern in managing and harvesting.

Most of the soils in this map unit have fair potential for urban uses. The clayey subsoil is a limitation that needs to be considered in installing sanitary facilities and in making shallow excavations. Low strength and, in a few places, wetness from a seasonal high water table are concerns if community development is planned. The soils in this map unit have good potential for recreational uses.

3. Hayesville-Bradson-Tusquitee

Deep, moderately steep, well drained loamy soils that formed in material weathered from granite, gneiss, and schist, or in loamy or clayey sediment; on intermountain plateaus.

This map unit is made up of soils on broad ridgetops and on long hillsides of intermountain plateaus and of soils in colluvial areas that have long, convex slopes. Slopes range from 10 to 25 percent. Areas of this unit are throughout Rabun County.

This map unit makes up about 22 percent of the county. It is about 43 percent Hayesville soils, 42 percent Bradson soils, 10 percent Tusquitee soils, and 5 percent soils of minor extent.

Hayesville soils formed in material weathered from granite, gneiss, and schist. They have a clayey subsoil. Typically, the surface layer is dark brown fine sandy loam about 2 inches thick. The subsurface layer is yellowish brown fine sandy loam about 6 inches thick. The subsoil extends to a depth of 55 inches. It is yellowish red sandy clay loam in the upper part, red clay loam and clay in the middle part, and red clay loam in the lower part. Below this, to a depth of 72 inches or more, is soft weathered saprolite.

Bradson soils formed in sediment. They have a clayey subsoil. Typically, the surface layer is brown fine sandy loam about 6 inches thick. The subsoil extends to a depth of 67 inches. It is yellowish red clay loam in the upper part, red clay in the middle part, and red clay loam in the lower part. The substratum, to a depth of 90 inches or more, is red and strong brown saprolite.

Tusquitee soils formed in sediment. They have a loamy subsoil. Typically, the surface layer is about 11 inches thick. It is dark brown loam in the upper part and dark reddish brown loam in the lower part. The subsoil extends to a depth of 60 inches or more. It is brown fine sandy loam in the upper part, dark yellowish brown clay loam in the middle part, and dark yellowish brown loam in the lower part. A few angular pebbles are throughout the profile.

The minor soils in this unit are Dyke and Rabun. These soils have dark red clayey subsoils. Dyke soils are in colluvial areas together with Bradson and Tusquitee soils; Rabun soils are on narrow ridgetops and sides of mountains.

The soils in this map unit are used mainly for pasture and woodland. These soils have poor potential for farming and for urban or recreational uses because of slope. They have fair potential for pasture. These soils have good potential for woodland. The hazard of erosion, however, is an important management concern.

4. Saluda-Rabun-Evard

Shallow or deep, moderately steep or steep, well drained, mainly loamy soils that formed in material weathered from granite, gneiss, and schist or from rock high in content of ferromagnesian minerals; on ridgetops and the sides of mountains

This map unit is made up of soils on narrow ridgetops and on long sides of mountains that range in elevation from 1,500 to 3,300 feet. Slopes range from 10 to 50 percent. Most of this map unit is near Lake Burton in Rabun County.

This map unit makes up about 8 percent of the county. It is about 45 percent Saluda soils, 23 percent Rabun soils, 20 percent Evard soils, and 12 percent soils of minor extent.

Saluda soils are shallow. Typically, Saluda soils have a brown fine sandy loam surface layer about 3 inches thick. The subsoil is yellowish red sandy clay loam about 12 inches thick. It is underlain by vari-colored, highly weathered granite, gneiss, or schist that extends to a depth of 60 inches or more. Hard rock is at a depth of 5 feet or more. Two to 15 percent stones and cobbles are throughout the soil.

Rabun soils are deep. Typically, the surface layer is dark reddish brown loam about 9 inches thick. The subsoil is dark red clay and extends to a depth of about 48 inches. The substratum, to a depth of 62 inches or more, is strong brown and yellowish red saprolite.

Evard soils are deep. Typically, Evard soils have a predominantly reddish brown sandy loam surface layer about 5 inches thick. The subsoil is yellowish red sandy clay loam and extends to a depth of 34 inches. Below this yellowish red, red, and yellowish brown saprolite. This is underlain by moderately hard weathered granite gneiss to a depth of 50 inches. About 10 percent quartz pebbles and cobbles are throughout the soil.

The minor soils in this map unit are Bradson, Dyke, Edneyville, and Tusquitee soils. The Bradson, Dyke, and Tusquitee soils are in lower lying colluvial areas. The Edneyville soils are in the same mountain landscapes with the major soils. The Edneyville soils are mostly at elevations higher than 2,000 feet.

The soils in this map unit are mainly wooded. Virginia pine, shortleaf pine, and yellow-poplar have been planted in most cleared areas. The soils in this map unit have poor potential for farming and for urban or recreational uses because of slope. They have fair potential for pasture on the less sloping areas of the map unit.

The soils in this map unit have fair potential for woodland. Moderately steep and steep slopes and the hazard of erosion are the main management concerns in harvesting and regeneration. The hazard of ice damage along the ridgetops of high elevations is also a management concern.

5. Saluda-Ashe

Shallow or moderately deep, steep or very steep, well drained or somewhat excessively drained loamy soils that formed in material weathered predominantly from granite, gneiss, and schist; mainly on the sides of mountains

This map unit is made up of soils mainly on the uneven sides of mountains that range in elevation from 1,800 to 4,500 feet. Slopes range from 25 to 90 percent. Areas of this map unit are throughout Rabun county.

This map unit makes up about 25 percent of the county. It is about 42 percent Saluda soils, 25 percent Ashe soils, and 33 percent soils of minor extent.

Saluda soils are shallow and well drained. Typically, the surface layer is brown stony fine sandy loam about 6 inches thick. The subsoil is yellowish red sandy clay loam about 11 inches thick. It is underlain by vari-colored, highly weathered granite, gneiss, or schist. Hard rock is at a depth of 5 feet or more, and there is 15 to 25 percent stones and cobbles throughout the soil.

Ashe soils are moderately deep and somewhat excessively drained. Typically, the surface layer is brown stony sandy loam about 8 inches thick. The subsoil is strong brown sandy loam and extends to a depth of about 28 inches. Below this is saprolite. Gneissic bedrock is at a depth of about 36 inches. Surface stone is 10 to 15 percent by volume; coarse fragments within the soil are 15 to 25 percent.

The minor soils in this map unit are the Edneyville, Evard, Rabun, and Tusquitee soils. These soils are deep. The Edneyville, Evard, and Rabun soils are in the same mountain landscapes together with the major soils. Tusquitee soils are in lower lying colluvial areas.

The soils in this map unit are wooded. Areas of soils are made up of mixed hardwoods and pines. These soils have poor potential for farming and for urban or recreational use because of slope.

The soils in this map unit have fair potential for woodland. Steep and very steep slopes, stoniness, boulders on the surface, and the hazard of erosion are main management concerns in harvesting and regeneration. The hazard of ice damage along the ridgetops of high elevations is also a management concern.

6. Tusquitee-Edneyville-Porters

Deep and moderately deep, moderately steep to very steep, well drained loamy soils that formed in loamy sediment or in material weathered predominantly from gneiss and schist; on mountains

This map unit is made up of soils in colluvial areas and soils on narrow ridgetops and on long, uneven sides of mountains that range in elevation from 2,500 to 4,500 feet or more. Slopes range from 10 to 75 percent. Large areas of this map unit are in the northern and western part of Rabun County.

This map unit makes up about 35 percent of the county. It is about 29 percent Tusquitee soils, 17 percent Edneyville soils, 16 percent Porters soils, and 38 percent soils of minor extent.

Tusquitee soils are deep and are in coves of the mountains. Typically, the surface layer is predominantly dark reddish brown loam about 11 inches thick. The subsoil is predominantly dark yellowish brown and extends to a depth of 60 inches or more. It is fine sandy loam in the upper part, clay loam in the middle part, and loam in the lower part. Stone content is as much as 15 percent by volume throughout.

Edneyville soils are deep and are on ridgetops and the sides of higher mountains. Typically, the surface layer is grayish brown stony sandy loam about 7 inches thick. The subsoil is yellowish brown sandy clay loam about 30 inches thick. Below this is a few inches of granite gneiss saprolite underlain by weathered granite gneiss bedrock. Many stones are throughout the soil.

Porters soils are moderately deep and are on the sides of mountains. Typically, the Porters soils have a predominantly very dark brown stony loam surface layer 7 inches thick. The brown subsoil is about 18 inches thick. It is sandy loam in the upper part, sandy clay loam in the middle part, and sandy loam in the lower part. Below this, at a depth of 40 inches, is brown saprolite underlain by bedrock. Cobbles and stones are throughout the soil.

The minor soils in this unit are Ashe, Evard, Haywood, and Saluda soils. In addition, Rock outcrop makes up part of the map unit. These minor soils and the Rock outcrop are in the same mountain landscape together with the major soils, but the Saluda soils are shallow.

The soils in this map unit are wooded. Areas are made up of mixed hardwoods and pines. The soils in this map unit have poor potential for farming and urban or recreational uses because of slope and large stones. They have fair potential for pasture on the less sloping parts of the map unit.

The soils in this map unit have good potential for woodland. Moderately steep to very steep slopes, stoniness, rockiness, and the hazard of erosion are management concerns in harvesting and regeneration.

7. Lily-Ramsey-Saluda

Moderately deep and shallow, moderately steep to very steep, well drained or somewhat excessively drained loamy soils that formed in material weathered from quartzite or granite, gneiss, and schist; mainly on the sides of mountains

This map unit is made up of soils on narrow ridgetops and on long, uneven, and complex mountainsides that range in elevation from 1,500 to 3,300 feet. Slopes range from 10 to 90 percent. This map unit is near Tallulah Falls in Rabun County.

This map unit makes up about 3 percent of the county. It is about 44 percent Lily soils, 22 percent Ramsey soils, 20 percent Saluda soils, and 14 percent soils of minor extent.

Lily soils are moderately deep, well drained, and formed in material weathered from quartzite. Typically, the surface layer is dark grayish brown fine sandy loam about 5 inches thick. The sandy clay loam subsoil extends to a depth of about 28 inches. It is yellowish brown in the upper part and strong brown in the lower part. Below this is 11 inches of strong brown loamy sand overlying hard sandstone.

Ramsey soils are shallow, somewhat excessively drained, and formed in material weathered from quartzite. Typically, Ramsey soils have a dark brown stony sandy loam surface layer about 1 inch thick. The subsurface layer is brown sandy loam to a depth of about 5 inches. The subsoil is yellowish brown stony sandy loam to a depth of about 14 inches. Below this is a few inches of weathered sandstone. Hard rock is at a depth of about 17 inches.

Saluda soils are shallow, well drained, and formed in material weathered from granite, gneiss, and schist. Typically, Saluda soils have a brown fine sandy loam surface layer about 5 inches thick. The subsoil is yellowish red sandy clay loam about 11 inches thick. It is underlain by vari-colored, highly weathered granite, gneiss, or schist that extends to a depth of 5 feet or more. Hard rock is at a depth of 5 feet or more. Five to 15 percent stones and cobbles are throughout the soil.

The minor soils in this map unit are the Ashe and Evard soils. In addition, Rock outcrop makes up part of the map unit. The Ashe and Evard soils and the Rock outcrop are in the same mountain landscape together with the major soils, but the Evard soils are deep.

The soils in this map unit are wooded. Areas are made up of low grade hardwoods, Virginia pine, and shortleaf pine. The soils in this map unit have poor potential for farming and for urban or recreational uses because of slope. They have fair potential for pasture on the less sloping areas of the map unit.

The soils in this map unit have fair potential for woodland. Moderately steep to very steep slopes, stoniness, rockiness, and hazard of erosion are the main management concerns in harvesting and regeneration.

Descriptions and potentials of map units in Towns County

1. Toxaway-Transylvania-Chatuge

Deep, nearly level, very poorly drained or poorly drained, and moderately well drained or well drained soils that formed in loamy sediment; on flood plains and low lying stream terraces

This map unit is made up of soils on moderately broad flood plains and low lying stream terraces in the valleys of mountains. The nearly level landscape is commonly expressed by low lying, very poorly drained or poorly drained areas, and somewhat higher lying and better drained areas. Most streams in this map unit are free flowing, but some are clogged by debris. In places, the stream channel has abraded to bedrock. This map unit has a high probability of flooding during winter and spring, and streambank erosion is a serious hazard. Slopes are less than 4 percent. Areas of this map unit are throughout Towns County.

This map unit makes up about 6 percent of the county. It about 27 percent Toxaway soils, 25 percent Transylvania soils, 20 percent Chatuge soils, and 28 percent soils of minor extent.

Toxaway soils are very poorly drained or poorly drained. Typically, the surface layer is black silt loam, about 28 inches thick. The underlying layers extend to a depth of 60 inches or more. The upper layer and middle layer are very dark gray. The upper layer is silt loam, and the middle layer is loam. The lower layer is dark grayish brown loamy sand.

Transylvania soils are moderately well drained or well drained. Typically, the surface layer is about 25 inches thick. It is very dark gray in the upper part, and very dark grayish brown in the lower part. The silt loam subsoil extends to a depth of 46 inches. It is brown in the upper part, dark brown mottled with strong brown in the middle part, and very dark gray mottled with strong brown in the lower part. Below this is very dark gray stratified silt loam and sand.

Chatuge soils are poorly drained. Typically, the surface layer is very dark gray loam about 8 inches thick. The subsoil, to a depth of about 48 inches, is dark gray clay loam mottled with yellowish brown. The substratum, to a depth of 60 inches or more, is mainly dark gray gravelly coarse sand.

The minor soils in this unit are the Dillard, Dyke, and Toccoa. The moderately well drained Dillard soils and well drained Dyke soils commonly are on the higher lying stream terraces or at the toe slopes of mountains. The well drained Toccoa soils are in the same landscape together with the major soils.

The soils in this map unit are used mainly for cultivated crops and pasture, but some soils are in mixed stands of hardwoods. Most soils have good potential for row crops, truck crops, small grain, hay, and pasture. Wetness and flooding, however, are a common management concern.

The soils in this map unit have good potential for woodland. Wetness and flooding limit the use of equipment in managing and harvesting.

The soils in this map unit have poor potential for urban and most recreational uses. Wetness and flooding are primary concerns for use and management.

2. Bradson-Hayesville-Dyke

Deep, gently sloping and sloping, well drained clayey soils that formed in loamy or clayey sediment or in material weathered from granite, gneiss, and schist; on stream terraces or intermountain plateaus

This map unit is made up of soils on stream terraces, in colluvial areas, or on broad ridgetops of intermountain plateaus. Slopes are smooth and convex and range from 2 to 10 percent. Areas of this map unit are mainly in the central and western parts of Towns County.

This map unit makes up about 8 percent of the county. It is about 54 percent Bradson soils, 17 percent Hayesville soils, 15 percent Dyke soils, and 14 percent soils of minor extent.

Bradson soils are well drained, and are in colluvial areas of the intermountain plateaus. Typically, the surface layer is brown fine sandy loam about 6 inches thick. The subsoil is red and extends to a depth of 80 inches. It is clay loam in the upper part, clay in the middle part, and clay loam in the lower part.

Hayesville soils are well drained, and are on intermountain plateaus. Typically, the surface layer is dark brown fine sandy loam about 7 inches thick. The subsoil is red and extends to a depth of about 55 inches. It is clay loam in the upper part, clay in the middle part, and clay loam in the lower part. Below this, to a depth of 72 inches or more, is saprolite.

Dyke soils are well drained, and are on stream terraces. Typically, the surface layer is dark reddish brown loam about 8 inches thick. The subsoil is dark red and extends to a depth of about 72 inches. The upper few inches is clay loam, and the rest is clay.

The minor soils in this map unit are Dillard, Fannin, and Tusquitee soils. The moderately well drained Dillard soils and the well drained Tusquitee soils are in the same stream terraces or colluvial landscapes together with Bradson and Dyke soils. Fannin soils are in the same intermountain plateaus together with the Hayesville soils.

The soils in this map unit are used mainly for cultivated crops and pasture, but some are wooded or idle. These soils have good potential for row crops, truck crops, small grains, hay, and pasture. They have limited potential for intensive cropping unless slopes are protected from erosion.

The soils in this map unit have good potential for woodland. In places, however, equipment limitation is a concern in managing and harvesting.

Most of the soils in this map unit have fair potential for urban uses. The clayey subsoil is a limitation that needs to be considered in installing sanitary facilities and in making shallow excavations. Low strength is a common concern if community development is planned. The soils in this map unit have excellent potential for recreational uses.

3. Hayesville-Bradson-Fannin

Deep and moderately deep, moderately steep, well drained mainly clayey soils that formed in material weathered from granite, gneiss, and schist or in loamy and clayey sediment on intermountain plateaus

This map unit is made up of soils on broad ridgetops and on long hillsides of intermountain plateaus, and soils in colluvial areas that have long, convex slopes. Slopes range from 10 to 25 percent. Areas of this map unit are throughout Towns County.

This map unit makes up about 19 percent of the county. It is about 57 percent Hayesville soils, 25 percent Bradson soils, 9 percent Fannin soils, and 9 percent soils of minor extent.

Hayesville soils are deep and are on intermountain plateaus. Typically, the surface layer is dark brown fine sandy loam about 2 inches thick. The subsurface layer is yellowish brown fine sandy loam about 6 inches thick. The subsoil is predominantly red and extends to a depth of 55 inches. It is sandy clay loam in the upper part, clay loam and clay in the middle part, and clay loam in the lower part. Below this, to a depth of 72 inches or more, is soft weathered saprolite.

Bradson soils are deep and are in colluvial areas of intermountain plateaus. Typically, the surface layer is brown fine sandy loam about 6 inches thick. The subsoil is predominantly red and extends to a depth of 67 inches. It is clay loam in the upper part, clay in the middle part, and clay loam in the lower part. The substratum, to a depth of 90 inches or more, is red and strong brown saprolite.

Fannin soils are moderately deep and are on intermountain plateaus. Typically, the surface layer is dark grayish brown fine sandy loam about 4 inches thick. The subsurface layer is brown fine sandy loam about 5 inches thick. The subsoil is predominantly red clay loam and extends to a depth of 35 inches. Below this is weathered mica schist saprolite.

The minor soils in this map unit are Dyke and Tusquitee soils. These soils are in the same colluvial landscapes together with the Bradson soils.

The soils in this map unit are used mainly for pasture and woodland (fig. 2). These soils have poor potential for farming and for urban or recreational uses because of slope. They have fair potential for pasture. The soils have good potential for woodland. The hazard of erosion, however, is a managment concern.

4. Rabun-Evard-Saluda

Deep or shallow, moderately steep or steep, well drained clayey and loamy soils that formed from rock high in content of ferromagnesian minerals and in material weathered from granite, gneiss, and schist; on ridgetops and the sides of mountains

This map unit is made up of soils on narrow ridgetops and on long sides of mountains that range in elevation from 1,500 to 3,300 feet. Slopes range from 10 to 50 percent. Most of this map unit is in the northwest part of Towns County.

This map unit makes up about 5 percent of the county. It is about 49 percent Rabun soils, 11 percent Evard soils, 10 percent Saluda soils, and 30 percent is soils of minor extent.

Rabun soils are deep. Typically, the surface layer is dark reddish brown loam about 9 inches thick. The dark red clay subsoil extends to a depth of about 48 inches. The substratum, to a depth of 62 inches or more, is strong brown and yellowish red saprolite.

Evard soils are deep. Typically, Evard soils have a predominantly reddish brown sandy loam surface layer about 5 inches thick. The subsoil is yellowish red sandy clay loam and extends to a depth of 34 inches. Below this is yellowish red, red, and yellowish brown saprolite. This is underlain by moderately hard weathered granite gneiss at a depth of 50 inches. About 10 percent quartz pebbles and cobbles by volume are throughout the soil.

Saluda soils are shallow. Typically, Saluda soils have brown fine sandy loam surface layer about 3 inches thick. The subsoil is yellowish red sandy clay loam about 12 inches thick. It is underlain by vari-colored highly weathered granite, gneiss, or schist that extends to a depth of 60 inches or more. Hard rock is at a depth of 5 feet or more. Two to 15 percent stones and cobbles are throughout the soil.

The minor soils in this map unit are Bradson, Dyke, and Tusquitee soils. These soils are in lower lying colluvial areas.

The soils in this map unit are mainly wooded. Virginia pine, shortleaf pine, and yellow-poplar have been planted in most cleared areas. The soils in this map unit have poor potential for farming and for urban or recreational uses because of slope. These soils have fair potential for pasture on the less sloping parts of the mapped area.

The soils in this map unit have good potential for woodland. Moderately steep and steep slopes, stoniness and the hazard of erosion are the main management concerns in harvesting and regeneration. The hazard of ice damage along the ridgetops of high elevations is also a management concern.

5. Evard-Saluda-Tusquitee

Deep or shallow, steep or very steep, well drained loamy soils that formed in material weathered from granite, gneiss, and schist or in loamy sediment; on ridgetops on the sides of mountains

This map unit is made up of soils that are mainly on uneven sides of mountains that range in elevation from 1,800 to 4,500 feet, and soils in colluvial areas. Slopes range from 25 to 90 percent. Areas of this map unit are throughout Towns County.

This map unit makes up about 5 percent of the county. It is about 44 percent Evard soils, 13 percent Saluda soils, 11 percent Tusquitee soils, and 32 percent soils of minor extent.

Evard soils are deep and are on the sides of mountains. Typically, Evard soils have a predominantly reddish brown sandy loam surface layer about 5 inches thick. The subsoil is yellowish red sandy clay loam and extends to a depth of 34 inches. Below this is yellowish red, red, and yellowish brown saprolite. This is underlain by moderately hard, weathered granite gneiss at a depth of 50 inches. About 10 percent quartz pebbles and cobbles by volume are throughout the soil.

Saluda soils are shallow and are on ridgetops and the sides of mountains. Typically, the surface layer is brown stony fine sandy loam about 6 inches thick. The subsoil is yellowish red sandy clay loam about 11 inches thick. It is underlain by vari-colored, highly weathered granite, gneiss, or schist. Hard rock is at a depth of 5 feet or more. Fifteen to 25 percent stones and cobbles are throughout the soil.

Tusquitee soils are deep and are in colluvial areas of the mountains. Typically, the loam surface layer is about 12 inches thick. It is very dark grayish brown in the upper part and dark yellowish brown in the lower part. The subsoil extends to a depth of 72 inches or more. It is dark yellowish brown loam in the upper part and is clay loam that is brown overlying dark yellowish brown in the lower part. A few angular pebbles are throughout the soil.

The minor soils in this map unit are the Edneyville, Hayesville, and Rabun soils. These deep soils are in the same mountain landscapes together with the Evard and Saluda soils.

The soils in this map unit are wooded. Areas of soils are made up of mixed hardwoods and pines. The soils in this map unit have poor potential for farming and for urban or recreational uses because of slope.

The soils in this map unit have fair potential for woodland. Steep and very steep slopes, stoniness, and the hazard of erosion are the main management concerns in harvesting and regeneration. The hazard of ice damage along the ridgetops of high elevations is also a management concern.

6. Tusquitee-Porters-Edneyville

Deep and moderately deep, moderately steep to very steep, well drained loamy soils that formed in loamy sediment or in material weathered predominantly from gneiss and schist; on mountains

This map unit is made up of soils in colluvial areas, on narrow ridgetops, and on long, uneven sides of mountains that range in elevation from 2,500 to 4,500 feet or more. Slopes range from 10 to 75 percent. Large areas of this map unit are mainly in the eastern and southern parts of Towns County.

This map unit makes up about 57 percent of the county. It is about 28 percent Tusquitee soils, 17 percent Porters soils, 14 percent Edneyville soils, and 41 percent soils of minor extent.

Tusquitee soils are deep and are in colluvial areas of the mountains. Typically, the surface layer is predominantly dark reddish brown loam about 11 inches thick. The subsoil is predominantly dark yellowish brown and extends to a depth of 60 inches or more. It is fine sandy loam in the upper part, clay loam in the middle part, and loam in the lower part. As much as 15 percent stone content is throughout the soil.

Porters soils are moderately deep and are on the sides of mountains. Typically, Porters soils have a predominantly very dark brown stony loam surface layer 7 inches thick. The brown subsoil is about 18 inches thick.

It is sandy loam in the upper part, sandy clay loam in the middle part, and sandy loam in the lower part. Below this is brown saprolite underlain by bedrock at a depth of 40 inches. Cobbles and stones are throughout the soil.

Edneyville soils are deep and are on ridgetops and the sides of higher mountains. Typically, the surface layer is grayish brown stony sandy loam about 7 inches thick. The subsoil is yellowish brown sandy clay loam about 30 inches thick. Below this is a few inches of granite gneiss saprolite underlain by weathered granite gneiss bedrock. Many stones are throughout the soil.

The minor soils in this map unit are the Ashe and Haywood soils. In addition, Rock outcrop makes up part of the map unit. The Ashe and Haywood soils and the Rock outcrop are in the same mountain landscape together with the major soils.

The soils in this map unit are wooded. Areas of soils are made up of mixed hardwoods and pines. The soils in this map unit have poor potential for cultivated crops and for urban or recreational uses because of slope. They have fair potential for pasture on the less sloping parts of the map unit.

The soils in this map unit have good potential for woodland. Moderately steep to very steep slopes, stoniness, rockiness, and the hazard of erosion are management concerns in harvesting and regeneration.

Broad land use considerations

Deciding which land should be used for urban development is an important issue in the survey area. Each year a considerable amount of land is being developed for urban uses. It is estimated that about 2,000 acres is urban or built-up land. The general soil maps are most helpful for planning the general outline of urban areas; they cannot, however, be used for the selection of sites for specific urban structures. In general, in the survey area the soils that have good potential for cultivated crops also have good potential for urban development. The data about specific soils in this survey can be helpful in planning future land use patterns.

Areas where the soils are so unfavorable that urban development is prohibitive are extensive in the survey area. However, portions of the Bradson-Dyke-Dillard unit in Rabun County, and Bradson-Hayesville-Dyke unit in Towns County have fair potential for most urban uses.

Four soil units have good potential for farming. These are identified as soil units 1 and 2 on the general soil maps. In these units the dominant soils are Bradson, Dyke, Toxaway, and Transylvania. Wetness is a limitation to the nonfarm uses of Toxaway and Transylvania soils. With proper drainage, shaping of the surface, and flood control, these limitations can be overcome. It should be noted, however, that the soils have good potential for farming and many farmers have provided sufficient drainage for farm crops.

Vegetables and other specialty crops are suited to soils of the Toxaway-Transylvania-Toccoa unit and the Toxaway-Transylvania-Chatuge unit where proper drainage has been installed. Also suited to such crops are soils of the Bradson-Dyke-Dillard unit, and the Bradson-Hayesville-Dyke unit. These soils are predominantly well drained and warm up earlier in spring than the wetter soils. Nurseries are also suited to these better drained soils.

Most of the soils of the survey area have good or fair potential as woodland. Notable exceptions are the soils of the Lily-Ramsey-Saluda unit on which trees either do not grow naturally or produce poor wood crops.

The gently sloping and sloping Bradson-Dyke-Dillard unit in Rabun County and the Bradson-Hayesville-Dyke unit in Towns County have excellent potential as sites for parks and recreation areas. Hardwood forests enhance the beauty of much of these associations. All of these units provide habitat for many important species of wildlife.

Soil maps for detailed planning

The map units shown on the detailed soil maps at the back of this publication represent the kinds of soil in the survey area. They are described in this section. The descriptions together with the soil maps can be useful in determining the potential of a soil and in managing it for food and fiber production; in planning land use and developing soil resources; and in enhancing, protecting, and preserving the environment. More information for each map unit, or soil, is given in the section "Use and management of the soils."

Preceding the name of each map unit is the symbol that identifies the soil on the detailed soil maps. Each soil description includes general facts about the soil and a brief description of the soil profile. In each description, the principal hazards and limitations are indicated, and the management concerns and practices needed are discussed.

The map units on the detailed soil maps represent an area on the landscape made up mostly of the soil or soils for which the unit is named. Most of the delineations shown on the detailed soil map are phases of soil series.

Soils that have a profile that is almost alike make up a *soil series*. Except for allowable differences in texture of the surface layer or of the underlying substratum, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement in the profile. A soil series commonly is named for a town or geographic feature near the place where a soil of that series was first observed and mapped.

Soils of one series can differ in texture of the surface layer or in the underlying substratum and in slope, erosion, stoniness, salinity, wetness, or other characteristics that affect their use. On the basis of such differences, a soil series is divided into phases. The name of a *soil phase* commonly indicates a feature that affects use or management. For example: Hayesville fine sandy loam, 2 to 10 percent slopes, is one of several phases within the Hayesville series.

Some map units are made up of two or more dominant kinds of soil. Such map units are called soil complexes, soil associations, and undifferentiated groups.

A *soil complex* consists of areas of two or more soils that are so intricately mixed or so small in size that they cannot be shown separately on the soil map. Each area includes some of each of the two or more dominant soils, and the pattern and proportion are somewhat similar in all areas. Transylvania-Toxaway complex is an example.

A *soil association* is made up of soils that are geographically associated and are shown as one unit on the map because it is not practical to separate them. A soil association has considerable regularity in geographic pattern and in the kinds of soil that are a part of it. The extent of the soils can differ appreciably from one delineation to another; nevertheless, interpretations can be made for use and management of the soils. Tusquitee-Haywood association, steep, is an example.

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

Most map units include small, scattered areas of soils other than those that appear in the name of the map unit. Some of these soils have properties that differ substantially from those of the dominant soil or soils and thus could significantly affect use and management of the map unit. These soils are described in the description of each map unit. Some of the more unusual or strongly contrasting soils that are included are identified by a special symbol on the soil map.

Most mapped areas include places that have little or no soil material and support little or no vegetation. Such places are called *miscellaneous areas*; they are delineated on the soil map and given descriptive names. Rock outcrop is an example. Some of these areas are too small to be delineated and are identified by a special symbol on the soil map.

The acreage and proportionate extent of each map unit are given in table 4, and additional information on properties, limitations, capabilities, and potentials for many soil uses is given for each kind of soil in other tables in this survey. (See "Summary of tables.") Many of the terms used in describing soils are defined in the Glossary.

ACE—Ashe-Porters association, moderately steep. This map unit is made up of predominantly moderately deep, somewhat excessively drained or well drained mountain soils that formed in residuum from biotite gneiss interrupted by dykes of schist. The soils occur in this unit in a regular and repeating pattern. The somewhat excessively drained Ashe soils are on that part of ridgetops that commonly face north and east. Elevation ranges from about 3,000 to 4,5000 feet, and slopes range from 10 to 25 percent. Areas range from 5 to 60 acres in size.

Ashe soils make up about 60 percent of the map unit. Typically, the surface layer is very dark grayish brown sandy loam about 7 inches thick. A few stones are common. The subsoil is yellowish brown sandy loam and extends to a depth of 24 inches. Below this is saprolite. Bedrock is at a depth of about 36 inches.

Ashe soils are low in natural fertility and organic-matter content. They are strongly acid or very strongly acid throughout. Permeability is moderately rapid, and available water capacity is low.

Porters soils make up about 30 percent of the map unit. Typically, the surface layer is very dark grayish brown loam about 8 inches thick. A few stones are common. The subsoil is predominantly dark yellowish brown sandy clay loam and extends to a depth of about 30 inches. Below this is saprolite. Bedrock is at a depth of about 50 inches.

Porters soils are low in natural fertility and organic-matter content. They are medium acid throughout. Permeability is moderately rapid, and available water capacity is medium.

Included with these soils in mapping are a few areas of Edneyville and Tusquitee soils. Edneyville soils are on lower lying and smoother landscapes; Tusquitee soils are in coves and saddles or on footslopes. Also included are small areas of Rock outcrop.

The soils in this map unit are wooded and have fair potential for upland oak and pine. There are commonly no significant harvesting and regeneration limitations, but in places small stones and rock are a concern. Ice damage is a hazard along ridgetops of high elevations.

The soils in this map unit have poor potential for cultivated crops and for urban or recreational use. The main limitations are depth to rock, slope, and stoniness.

This association is in capability subclass VIe.

ADG—Ashe association, stony, very steep. This map unit consists of moderately deep, somewhat excessively drained and well drained soils on mountains. They formed in material weathered from granite, gneisses, and schists. This association is on the sides of higher mountains that range in elevation from about 2,500 feet to more than 4,500 feet. Slopes commonly have southeast to west aspect. They range from 50 to 75 percent, but are mostly 50 to 65 percent. Areas are regular in shape in a repeating pattern and range from 5 to 120 acres.

In a typical area of this association is 65 percent Ashe soils, 10 percent Edneyville soils, and 10 percent soils that are similar to Ashe soils, but have 35 to 45 percent stone, by volume, on the surface. Typically, the surface layer of the Ashe soil is predominantly brown stony sandy loam about 8 inches thick. The subsoil extends to a depth of about 28 inches and is strong brown sandy loam. Below this is saprolite. Gneissic bedrock is at a depth of about 36 inches. Content of coarse fragments is 10 to 15 percent throughout.

Ashe soils are low in natural fertility and organic-matter content. They are strongly acid or very strongly acid throughout. Permeability is moderately rapid, and the available water capacity is low.

Included in mapping are a few areas of well drained Tusquitee soils along some drainageways and Rock outcrop in a few places.

The soils in this map unit have poor potential for woodland. Pitch pine, shortleaf pine, chestnut, scarlet, and black oak are better for management than other species. Because these soils are predominantly moderately deep, windthrow is a hazard. Very steep slopes, stoniness, rockiness, and the hazard of erosion are limitations in harvesting and regenerating these trees.

The soils in this map unit have poor potential for farming and for urban or recreational uses. Very steep slopes, stoniness, and depth to rock are the main limitations.

This association is in capability subclass VIIs.

BrC—Bradson fine sandy loam, 2 to 10 percent slopes. This deep, well drained, gently sloping and sloping soil is at the toe of slopes, in coves or saddles of the mountains. Slopes are smooth and convex. Individual areas are 3 to 40 acres.

Typically, the surface layer is brown fine sandy loam about 6 inches thick. The subsoil extends to a depth of 67 inches. It is yellowish red clay loam in the upper part, red clay in the middle part, and red clay loam in the lower part. The substratum, to a depth of 90 inches or more, is red and strong brown saprolite.

This soil is medium in natural fertility and low in organic-matter content. It is strongly acid or very strongly acid throughout unless it has been limed. Permeability is moderate, and the available water capacity is medium. This soil has good tilth and can be worked throughout a fairly wide range of moisture conditions. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas that have slopes of more than 10 percent, and a few small eroded areas that have a yellowish red clay loam surface layer. Also included are a few small intermingled areas of Dyke and Hayesville soils. The included soils make up about 15 percent of this map unit, but individual areas generally are less than 3 acres.

This soil has good potential for row crops, truck crops, small grains, hay, and pasture. It has limited potential in places because some areas are small and are adjacent to steep or sloping areas. Good tilth is easily maintained by returning crop residue to the soil. Erosion is a moderate hazard to cultivated crops. Minimum tillage and use of cover crops, including grasses and legumes in the cropping system, help reduce runoff and control erosion.

This soil has good potential for yellow-poplar, northern red oak, eastern white pine, black walnut, and loblolly pine. There are no important limitations for woodland use or management.

This soil has fair potential for most urban uses. The clayey subsoil is a limitation for most sanitary facilities and for shallow excavations. Low strength is a limitation for most community uses.

This soil is in capability subclass IIIe.

BrE—Bradson fine sandy loam, 10 to 25 percent slopes. This deep, well drained, moderately steep soil is on toe slopes and in coves or saddles of mountains. Slopes are long and convex. Individual areas range from 5 to 150 acres.

Typically, the surface layer is brown fine sandy loam about 6 inches thick. The subsoil is predominantly red and extends to a depth of 67 inches. It is clay loam in the upper part, clay in the middle part, and clay loam in the lower part. The substratum, to a depth of 90 inches or more, is red and strong brown saprolite.

This soil is medium in natural fertility and low in organic-matter content. It is strongly acid or very strongly acid throughout, unless it has been limed. Permeability is moderate, and available water capacity is medium. This soil has good tilth and can be worked throughout a fairly wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are small areas that have slopes of less than 10 percent. Also included are a few intermingled areas of Dyke and Hayesville soils and areas that have a sandy loam or gravelly sandy loam surface layer. The included soils make up about 10 percent of this map unit, but individual areas generally are less than 3 acres.

This soil has poor potential for row crops, truck crops, and small grain. Potential is limited mainly because of slope and the severe hazard of erosion. It has fair potential for hay and pasture.

This soil has good potential for yellow-poplar, northern red oak, eastern white pine, black walnut, and loblolly pine (fig. 3). The hazard of erosion can be overcome by good management.

This soil has poor potential for most urban and recreational uses because of slope.

This soil is in capability subclass VIe.

Ch—Chatuge loam. This deep, poorly drained, nearly level soil is on low stream terraces in moderately broad valleys of the mountains. In places, it is at the heads of drainageways or on toe slopes of mountains. It is occasionally flooded for very brief periods during winter and spring. Individual areas range from 3 to 60 acres.

Typically, the surface layer is very dark gray loam about 8 inches thick. The subsoil, to a depth of about 48 inches, is dark gray clay loam that has yellowish brown mottles. The substratum, to a depth of 60 inches or more, is mainly dark gray gravelly coarse sand.

This soil is medium in natural fertility and organic-matter content. It ranges from very strongly acid to medium acid throughout. Permeability is moderate, and available water capacity is high. This soil has good tilth and can be worked throughout a fairly wide range of moisture content. The root zone is deep, but a water table is commonly between 12 to 24 inches in depth during winter and spring.

Included with this soil in mapping are a few small intermingled areas of Dillard, Toxaway, and Transylvania soils. Also included are small, poorly drained areas of soils that have clayey subsoils, and loamy soils that are less than 40 inches in depth to the underlying gravelly coarse sand. The included soils make up about 10 percent of this map unit, but individual areas generally are less than 3 acres.

This soil has fair potential for row crops, truck crops, small grain, hay, and pasture. Potential is limited because of occasional flooding, wetness, and the small size of some areas.

This soil has good potential for yellow-poplar, loblolly pine, eastern white pine, and American sycamore. Flooding and wetness limit the use of equipment in managing and harvesting the tree crop, but this limitation can be overcome by using equipment and logging during the drier seasons.

This soil has poor potential for urban uses. Wetness and flooding are the main limitations.

This soil is in capability subclass IIIw.

DhC—Dillard sandy loam, 2 to 6 percent slopes. This deep, moderately well drained, gently sloping soil is in narrow valleys, on stream terraces or on toe slopes of the mountains. Slopes are smooth and convex. Individual areas are 5 to 25 acres.

Typically, the surface layer is dark grayish brown sandy loam about 8 inches thick. The subsoil extends to a depth of 55 inches. It is yellowish brown sandy clay loam in the upper part, predominantly brownish yellow sandy clay loam that has gray mottles in the middle part, and light gray clay and clay loam that has strong brown, yellowish brown, reddish yellow, and olive yellow mottles in the lower part. The substratum, to a depth of 66 inches, is a thin layer of light gray clay underlain by yellowish brown mudstone.

This soil is medium in natural fertility and low in organic-matter content. It is strongly acid or very strongly acid throughout, unless it has been limed. Permeability is moderately slow, and available water capacity is medium. This soil has good tilth and can be worked throughout a fairly wide range of moisture conditions. Although the root zone is deep, a water table is commonly between depths of 24 to 36 inches in winter and early in spring.

Included with this soil in mapping are a few small areas near narrow drainageways that have slopes of more than 6 percent. Also included are a few small areas of the intermingled Bradson, Chatuge, Dyke, Toxaway, and Transylvania soils. The included soils make up about 15 percent of the map unit, but individual areas are generally less than 3 acres.

This soil has good potential for row crops, truck crops, small grains, hay, and pasture. Potential is limited in most places, because areas are small. Good tilth is easily maintained by returning crop residue to the soil.

This soil has good potential for yellow-poplar, loblolly pine, eastern white pine, northern red oak, and black walnut. Equipment limitation is a management concern, but this limitation can be overcome by using equipment and logging during the drier seasons.

This soil has poor potential for urban uses. Wetness from a seasonal high water table is the main limitation.

This soil is in capability subclass IIw.

DyC—Dyke loam, 2 to 10 percent slopes. This deep, well drained, gently sloping and sloping soil is on high stream terraces and on colluvial fans in valleys of the mountains. In places, it is on toe slopes, in coves, or in saddles of the mountains. Slopes are smooth and convex. Individual areas range from 3 to 70 acres.

Typically, the surface layer is dark reddish brown loam about 8 inches thick. The dark red subsoil extends to a depth of about 72 inches. It is clay loam in the upper part and clay throughout the rest of the profile.

This soil is high in natural fertility and medium in organic-matter content. It is strongly acid throughout, unless it has been limed. Permeability is moderate, and available water capacity is medium. This soil has good tilth. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few small areas that have slopes of more than 10 percent. Also included are a few small areas of the intermingled Bradson and Hayesville soils and a soil that is similar but has less clay in the subsoil. The included soils make up about 10 percent of this map unit, but separate areas generally are less than 3 acres.

This soil has good potential for row crops, truck crops, small grains, hay, and pasture. Potential is limited in places, because some areas are small and are adjacent to steeper sloping areas. Good tilth is easily maintained by returning crop residue to the soil. The hazard of erosion is moderate for cultivated crops. Minimum tillage and use of cover crops, including grasses and legumes in the cropping system, help reduce runoff and control erosion.

This soil has good potential for yellow-poplar, northern red oak, eastern white pine, black walnut, and loblolly pine. Equipment limitations can be overcome by good management.

This soil has poor potential for most urban uses. Effluent moves slowly through the subsoil and is a limitation for septic tank absorption fields. In addition, the clayey subsoil is a limitation for most sanitary facilities. Low strength is the primary limitation for most community developments.

This soil is in capability subclass IIIe.

DyE—Dyke loam, 10 to 25 percent slopes. This deep, well drained, moderately steep soil is on toe slopes, in coves, or in saddles of mountains. Slopes are long and convex. Individual areas range from 5 to 100 acres.

Typically, the surface layer is dark reddish brown loam about 6 inches thick. The dark red subsoil extends to a depth of about 60 inches. It is clay loam in the upper part and clay throughout the rest of the profile.

This soil is high in natural fertility and has medium organic-matter content. It is strongly acid throughout, unless it has been limed. Permeability is moderate, and available water capacity is medium. This soil has good tilth. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are small areas that have slopes of less than 10 percent. Also included are a few small areas of the intermingled Bradson, Hayesville, and Rabun soils and a soil that is similar but has less clay in the subsoil. These included soils make up about 15 percent of this map unit, but separate areas generally are less than 3 acres.

This soil has fair potential for row crops, truck crops, small grain, hay, and pasture. Potential is limited mainly because of slope and the severe hazard of erosion. Good tilth is easily maintained by returning crop residue to the soil. Minimum tillage and the use of cover crops, including grasses and legumes in the cropping system, help reduce runoff and control erosion.

This soil has good potential for yellow-poplar, northern red oak, eastern white pine, black walnut, and loblolly pine. The hazard of erosion and equipment limitations can be overcome by good management.

This soil has poor potential for most urban and recreational uses because of slope.

This soil is in capability subclass IVe.

EdE—Edneyville sandy loam, 10 to 25 percent slopes. This deep, well drained, moderately steep soil is on the crest of ridgetops or the upper sides of mountains. This soil is commonly at an elevation of more than 2,000 feet. Slopes are undulating and convex and have most aspects, but the stronger sloping parts of this soil are mostly southerly. Individual areas range from 20 to 150 acres.

Typically, the surface layer is dark brown sandy loam about 5 inches thick. The subsurface layer is brown sandy loam and extends to a depth of 11 inches. The subsoil extends to a depth of 37 inches. It is brown sandy loam in the upper part, strong brown sandy clay loam in the middle part, and yellowish brown fine sandy loam in the lower part. Below this is about 1 foot of yellowish brown granite gneiss saprolite underlain by weathered multi-colored granite gneiss. Stones are throughout the soil.

This soil is low in natural fertility and medium in organic-matter content. It is strongly acid throughout. Permeability is moderate, and available water capacity is medium.

Included with this soil in mapping are a few areas of intermingled, Evard soil at lower elevations midway on mountainsides and Porters and Ashe soils that are on the somewhat higher lying mountains. Also included are small areas of Tusquitee soil in narrow concave mountain coves and a few areas of Edneyville sandy loam that have 25 to 45 percent slopes. The included soils make up about 15 to 25 percent of the map unit.

This soil has fair potential for northern red oak, white oak, black oak, eastern white pine, pitch pine, and shortleaf pine at the lower elevations. There are no significant harvesting and regeneration limitations, but there are some small areas that are extremely stony or rocky.

This soil has poor potential for cultivated crops and for urban or recreational uses. Slope is the main limitation. Seepage and depth to bedrock are limitations for most sanitary facilities.

This soil is in capability subclass VIe.

EPF—Edneyville-Ashe association, stony, steep. This map unit is made up of deep and moderately deep, well drained and somewhat excessively drained mountain soils that formed in material weathered from granite, gneisses, and schists. These soils are on the sides of higher mountains that range in elevation from 2,500 feet to more than 4,500 feet. Slopes are uneven and commonly have a southeast to west aspect. They range from 15 to 65 percent, but most range from 25 to 45 percent. The stony Ashe soils are commonly on the upper half of the mountainside, but in places are on the more broken parts that are midway and below. The stony Edneyville soils are on the smoother, more even mountainsides. Areas are regular in shape, repeating in pattern, and range from 25 to 250 acres.

The well drained Edneyville soils make up about 50 percent of the map unit. The surface layer is grayish brown stony sandy loam about 7 inches thick. The subsoil is yellowish brown sandy clay loam about 30 inches thick. Below this is a few inches of granite gneiss saprolite underlain by weathered granite gneiss bedrock. Many stones are throughout the soil.

Edneyville soils are low in natural fertility and medium in organic-matter content. They are strongly acid throughout. Permeability is moderate, and available water capacity is medium.

The somewhat excessively drained Ashe soils make up about 40 percent of the map unit. Typically, the surface layer is predominantly brown stony sandy loam about 8 inches thick. The subsoil, to a depth of 28 inches, is brown sandy loam. Below this is saprolite. Bedrock is at a depth of about 36 inches.

Ashe soils are low in natural fertility and organic-matter content. They are strongly acid throughout. Permeability is moderately rapid, and the available water capacity is low.

Included with these soils in mapping are areas of Rock outcrop that are commonly on the higher parts of mountains and other Rock outcrops that are uneven, broken, and sharp convex lower parts of the mountainside.

The soils in this map unit are wooded and have fair potential for use as woodland. Shortleaf pine, eastern white pine, pitch pine, chestnut oak, scarlet oak, and black oak are the best species for management. Steep slopes, areas of extreme stoniness, and rockiness are the main limitations for woodland management where conventional mechanical equipment is used. Another concern is the hazard of erosion.

The soils in this map unit have poor potential for cultivated crops and for urban or recreational uses. Steep slopes, stoniness, and rockiness are the main limitations.

This association is in capability subclass VIIs.

EVF—Evard association, steep. This map unit is made up of deep, well drained mountain soils that formed in material weathered from granite gneiss. These soils are mainly on narrow ridgetops and are midway on the uneven, complex sides of mountains that range in elevation from 1,500 to 2,800 feet. Slopes commonly have a south aspect and range from 25 to 50 percent. Areas are regular in shape, repeating in pattern, and range from 20 to 100 acres. Individual areas of each soil range from 10 to 25 acres.

In a typical area, this association is 65 percent Evard soils and soils that are similar to Evard soils. Also included are soils that have less than 10 percent each of Edneyville, Fannin, Hayesville, Saluda, and Tusquitee soils. The Evard and the similar soils, the Edneyville, and the Saluda soils are on mountain landscapes. The Fannin and Hayesville soils are on intermountain plateaus, and the Tusquitee soils are in mountain coves, in saddles, and on foot slopes of mountains. Typically, the Evard soils have a predominantly reddish brown sandy loam surface layer about 5 inches thick. The subsoil is yellowish red sandy clay loam and extends to a depth of 34 inches. Below this is yellowish red, red, and yellowish brown saprolite underlain by moderately hard weathered granite gneiss at a depth of 50 inches. About 10 percent quartz pebbles and cobbles by volume are throughout.

Evard soils are low in natural fertility and organic-matter content. They are strongly acid throughout. Permeability is moderate, and available water capacity is medium. The root zone is deep and is easily penetrated by plant roots.

The soils in this association have fair potential for shortleaf pine, eastern white pine, black oak, and red oak. The hazard of erosion and equipment limitations are management problems in harvesting and regeneration. Ice damage is a hazard along the ridgetops of high elevations.

The soils in this map unit have poor potential for cultivated crops and for urban or recreational uses. The steep slope is the main limitation.

This association is in capability subclass VIIe.

FaC—Fannin fine sandy loam, 2 to 10 percent slopes. This moderately deep, well drained, gently sloping and sloping soil is on moderately broad ridgetops of intermountain plateaus. Slopes are smooth and convex. Individual areas range from 5 to 30 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 9 inches thick. The subsoil is predominantly red clay loam and extends to a depth of about 35 inches. Below this is weathered mica schist saprolite.

This soil is medium in natural fertility and low in organic-matter content. It is strongly acid throughout unless it has been limed. Permeability is moderate, and available water capacity is medium. The soil has good tilth and can be worked throughout a fairly wide range of moisture content. The root zone is moderately deep and easily penetrated by plant roots.

Included with this soil in mapping are a few small areas with slopes of more than 10 percent, and a few small eroded areas of Fannin soils that have a clay loam surface layer. Also included are a few small areas of intermingled Hayesville soils. The included soils make up about 5 percent of this map unit, but separate areas generally are less than 3 acres.

This soil has fair potential for row crops, truck crops, small grains, hay, and pasture. Potential is limited because some areas are small, and the adjacent soils have slope. Good tilth is easily maintained by returning crop residue to the soil. The hazard of erosion is moderate if cultivated crops are grown. Minimum tillage and the use of cover crops, including grasses and legumes in the cropping system, help reduce runoff and control erosion.

This soil has good potential for yellow-poplar, northern red oak, eastern white pine, and loblolly pine. There are no significant limitations for woodland management.

This soil has poor potential for most urban uses because of the shallow depth to rock. Low strength is a limitation for most community uses.

This soil is in capability subclass IVe.

FaE—Fannin fine sandy loam, 10 to 25 percent slopes. This moderately deep, well drained, moderately steep soil is on moderately broad ridgetops and on hillsides of intermountain plateaus. Slopes are long and convex. Individual areas range from 10 to 60 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 4 inches thick. The subsurface layer is brown fine sandy loam about 5 inches thick. The subsoil is predominantly red clay loam and extends to a depth of 35 inches. Below this is weathered mica schist saprolite.

This soil is medium in natural fertility and low in organic-matter content. It is strongly acid throughout, unless it has been limed. Permeability is moderate, and available water capacity is medium. The root zone is moderately deep and is easily penetrated by plant roots.

Included with this soil in mapping are small areas that have slopes of less than 10 percent. Also included are a few areas of the intermingled Evard, Hayesville, and Saluda soils. The included soils make up about 15 percent of this map unit, but separate areas generally are less than 3 acres.

This soil has good potential for yellow-poplar, northern red oak, eastern white pine, and loblolly pine. The hazard of erosion and equipment limitations can be overcome by good management.

This soil has a poor potential for cultivated crops and for most urban and recreational uses. Depth to rock or slopes are the primary limitations.

This soil is in capability subclass VIIe.

HaC—Hayesville fine sandy loam, 2 to 10 percent slopes. This deep, well drained, gently sloping and sloping soil is on broad ridgetops of intermountain plateaus. Slopes are smooth and convex. Individual areas are 10 to 30 acres.

Typically, the surface layer is dark brown fine sandy loam about 7 inches thick. The red subsoil extends to a depth of about 55 inches. It is clay loam in the upper part, clay in the middle part, and clay loam in the lower part. Underlying this, to a depth of 72 inches or more, is saprolite.

This soil is medium in natural fertility and low in organic-matter content. It is strongly acid throughout unless it has been limed. Permeability is moderate, and available water capacity is medium. This soil has good tilth and can be worked throughout a fairly wide range of moisture conditions. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas that have slopes of more than 10 percent and a few small eroded areas of Hayesville soil that have a surface layer of clay loam. Also included are a few small areas of the intermingled Bradson and Dyke soils. The included soils make up about 5 percent of this map unit, but separate areas generally are less than 3 acres.

This soil has good potential for row crops, truck crops, small grains, hay, and pasture. Potential is limited in places because of some small areas and the slope of adjacent soils. Good tilth is easily maintained by returning crop residue to the soil. The hazard of erosion is moderate for cultivated crops. Minimum tillage and the use of cover crops, including grasses and legumes in the cropping system, help reduce runoff and control erosion.

This soil has good potential for yellow-poplar, northern red oak, eastern white pine, and loblolly pine. There are no significant limitations for woodland management.

This soil has fair potential for most urban uses. Effluent moves slowly through the subsoil and is a limitation for septic tank absorption fields. Also, the clayey subsoil is a limitation for most other sanitary facilities. Low strength is the primary limitation for most community uses.

This soil is in Capability subclass IIIe.

HaE—Hayesville fine sandy loam, 10 to 25 percent slopes. This deep, well drained, moderately steep soil is on broad ridgetops and on hill sides of intermountain plateaus. Slopes are long and convex. Individual areas are 10 to 100 acres.

Typically, the surface layer is dark brown fine sandy loam about 2 inches thick. The subsurface layer is yellowish brown fine sandy loam about 6 inches thick. The subsoil is predominantly red and extends to a depth of 55 inches. It is sandy clay loam in the upper part, clay loam and clay in the middle part, and clay loam in the lower part. Below this, to a depth of 72 inches or more, is soft weathered saprolite.

This soil is medium in natural fertility and low in organic-matter content. It is strongly acid throughout unless it has been limed. Permeability is moderate, and the available water capacity is medium. This soil has good tilth and can be worked throughout a fairly wide range of moisture content. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are small areas that have slopes of more than 25 percent. Also included are a few areas of the intermingled Bradson, Dyke, and Evard soils. These included soils make up about 15 percent of this map unit, but separate areas generally are less than 3 acres.

This soil has poor potential for row crops, truck crops, and small grains. Potential is limited mainly because of slope and the severe erosion hazard. This soil has fair potential for hay and pasture.

This soil has good potential for yellow-poplar, northern red oak, eastern white pine, and loblolly pine. The hazard of erosion can be overcome.

This soil has poor potential for most urban and recreational uses because of slope.

This soil is in capability subclass VIe.

LhE—Lily fine sandy loam, 10 to 25 percent slopes. This moderately deep, well drained, moderately steep soil is on ridgetops and mountainsides. It commonly ranges in elevation from 1,500 and 2,000 feet. The convex slopes are 300 to 800 feet long and mainly have a southern aspect. Individual areas range from 5 to 60 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 5 inches thick. The sandy clay loam subsoil extends to a depth of about 28 inches. It is yellowish brown in the upper part and strong brown in the lower part. Below this is 11 inches of strong brown loamy sand overlying hard sandstone.

This soil is low in natural fertility and organic-matter content. It is strongly acid or very strongly acid throughout, unless it has been limed. Permeability is moderately rapid, and available water capacity is moderately low. This soil has good tilth and can be worked throughout a wide range of moisture content. The root zone is moderately deep and is easily penetrated by plant roots.

Included in mapping are small areas that have slopes of less than 10 percent and a few small areas that have slopes of more than 25 percent. Also included are small areas of the intermingled Evard, Hayesville, Ramsey, and Saluda soils. A few small areas of Rock outcrop are included. The included soils make up about 20 percent of this map unit, but separate areas generally are less than 3 acres.

This soil has poor potential for row crops, truck crops, and small grain. Potential is limited mainly because of slope and the severe hazard of erosion. Potential is limited in places, because some areas are small and the adjacent soils are commonly stony. This soil has fair potential for hay and pasture.

This soil has fair potential for loblolly pine, shortleaf pine, and Virginia pine. The hazard of erosion is the main problem and can be overcome by good management.

This soil has poor potential for most urban and recreational uses. Depth to rock and slope are the main limitations.

This soil is in capability subclass VIe.

PCF—Porters association, stony, steep. This map unit is made up of moderately deep, well drained mountain soils that formed in material weathered from biotite gneisses and schists. This association is mainly on broad, long sides of mountains at elevations higher than 2,500 feet. Slopes have a northwest to east aspect and range from 25 to 50 percent. Mapped areas are regular in shape, repeating in pattern, and range from 25 to more than 250 acres.

In a typical area, this association is 65 percent Porters soils. The stony Edneyville, Evard, Haywood, Tusquitee, and Saluda soils make up the other 35 percent. Typically, Porters soils have a predominantly very dark brown stony loam surface layer 7 inches thick. The brown subsoil is about 18 inches thick. It is sandy loam in the upper part, sandy clay loam in the middle part, and sandy loam in the lower part. Below this is brown saprolite underlain by bedrock at a depth of 40 inches. Cobbles and stones are throughout.

Porters soils are low in natural fertility and organic-matter content. Permeability is moderately rapid, and available water capacity is medium. The soil is medium acid or strongly acid throughout.

Included in mapping are small, scattered areas of Rock outcrop.

The soils in this map unit are wooded. They have fair potential for northern red oak, white oak, and white pine. Laurel and rhododendron are common, and plant competition is severe. Steep slopes and stoniness are limitations in harvesting and regeneration. In places, rockiness and the hazard of erosion are limitations.

The soils in this map unit have poor potential for cultivated crops and for urban or recreational uses. Steep slopes, stoniness, and depth to rock are the main limitations.

This association is in capability subclass VIIs.

PCG—Porters association, stony, very steep. This map unit is made up of moderately deep, well drained mountain soils that formed in material weathered from biotite gneiss and schists. This association is on mountainsides at elevations commonly higher than 2,500 feet. Slopes have a north aspect and range from 50 to 65 percent. Mapped areas are regular in shape, repeating in pattern, and range from 50 to 250 acres.

In a typical area, this association is 65 percent Porters soils, soils that are similar to the Porters soils but have a higher stone content, and Tusquitee soils that are stony. Typically, Porters soils have a very dark grayish brown, stony loam surface layer 9 inches thick. The brown subsoil extends to a depth of 28 inches. It is sandy loam in the upper part, sandy clay loam in the middle part, and sandy loam in the lower part. Below this is brown saprolite underlain by bedrock at a depth of 40 inches. Stones are throughout the soil.

Porters soils are low in natural fertility and organic-matter content. Permeability is moderately rapid, and available water capacity is medium. The soil is medium acid or strongly acid throughout.

Included in mapping are small areas of Rock outcrop. Also included are slopes that range from 65 to 75 percent.

This association has good potential for northern red oak, white oak, yellow-poplar, white pine, and hemlock. Very steep slopes, stoniness, rockiness, and the hazard of erosion are severe limitations for harvesting and regeneration if conventional equipment is used. Cable logging is an alternative that can help overcome these limitations.

The soils in this association have poor potential for cultivated crops and for urban or recreational uses. Very steep slopes, stoniness, and depth to rock are the main limitations.

This association is in capability subclass VIIs.

RaE—Rabun loam, 10 to 25 percent slopes. This deep, well drained, moderately steep soil is on narrow ridgetops and on sides of mountains. This soil is at elevations that range from 2,200 to 3,200 feet. Slopes are irregular and complex, and mainly have a northwest and east aspect. Individual areas range from 10 to 100 acres.

Typically, the surface layer is dark reddish brown loam about 9 inches thick. The dark red clay subsoil extends to a depth of about 48 inches. The substratum, to a depth of 62 inches or more, is strong brown and yellowish red saprolite.

This soil is medium in natural fertility and low in organic-matter content. It ranges from strongly acid to slightly acid throughout unless it has been limed. Permeability is moderate, and available water capacity is medium. Tilth is good. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are small areas that have slopes of more than 25 percent and areas that are more commonly shallow to underlying saprolite. Also included are a few areas of intermingled Dyke, Evard, and Hayesville soils, and a few areas of Rabun stony loam, and Rabun clay loam. These included soils make up about 10 percent of this map unit, but separate areas generally are less than 3 acres.

This soil has poor potential for row crops, truck crops, and small grain mainly because of slope and the severe hazard of erosion. In addition, potential is limited in places, because some areas are small. This soil has fair potential for hay and pasture.

This soil has good potential for yellow-poplar, upland oaks, and eastern white pine. The hazard of erosion is a management problem and can be overcome by good woodland management.

This soil has poor potential for most urban and recreational uses because of slope.

This soil is in capability subclass VIe.

RbF—Rabun stony loam, 25 to 50 percent slopes. This deep, well drained, steep soil is on long mountainsides. This soil is at elevations that range from 2,200 to 3,200 feet. Slopes are irregular and convex and have mainly northwest and east aspects. Individual areas range from 10 to 100 acres.

Typically, the surface layer is predominantly dark reddish brown stony loam about 6 inches thick. The dark red subsoil extends to a depth of about 37 inches. It is clay loam in the upper part, clay in the middle part, and stony clay loam in the lower part. Below this, to a depth of 60 inches or more, is strong brown and yellowish red saprolite.

This soil is medium in natural fertility and low in organic-matter content. It ranges from strongly acid to slightly acid throughout. Permeability is moderate, and available water capacity is medium.

Included with this soil in mapping are small areas that have slopes of less than 25 percent, and areas that are more commonly shallow to the underlying saprolite. Also included are a few areas of intermingled Evard and Hayesville soils and a few small areas of Rabun stony clay loam. These included soils make up about 15 percent of this map unit, but separate areas generally are less than 3 acres.

This soil has good potential for yellow-poplar, northern red oak, eastern white pine, and black walnut. Steep slopes and stoniness are the main limitations for woodland management if conventional equipment is used. The hazard of erosion also is a concern.

This soil has poor potential for cultivated crops and for urban or recreational uses. Steep slopes and stoniness are the main limitations.

This soil is in capability subclass VIIs.

RLF—Ramsey-Lily association, stony, steep. This map unit is made up of shallow and moderately deep, somewhat excessively drained and well drained mountain soils. The soils are mainly on uneven, complex sides of mountains that face south. Elevation ranges from 1,500 to 2,000 feet, and slopes range from 25 to 50 percent. Ramsey soils are on narrow ridgetops and mountainsides, and Lily soils are on broad ridgetops and in the upper parts of narrow drainageways. Mapped areas are mostly long, narrow, and parallel to drainageways. Mapped areas are regular in shape, repeating in pattern, and range from 20 to 100 acres.

Shallow, somewhat excessively drained Ramsey soils make up about 55 percent of this map unit. Typically, Ramsey soils have a dark brown stony sandy loam surface layer about 1 inch thick. The subsurface layer is brown stony sandy loam to a depth of about 5 inches. The subsoil is yellowish brown stony sandy loam to a depth of about 14 inches. Below this is a few inches of weathered sandstone. Hard rock is at a depth of about 17 inches.

Ramsey soils are low in natural fertility and organic-matter content. They are strongly acid throughout. Permeability is rapid, and available water capacity is low. The root zone is shallow.

The moderately deep, well drained Lily soils make up about 30 percent of this map unit. Typically, Lily soils have a dark grayish brown fine sandy loam surface layer about 5 inches thick. The sandy clay loam subsoil extends to a depth of about 28 inches. It is yellowish brown in the upper part and strong brown in the lower part. Below this is 11 inches of strong brown loamy sand overlying hard sandstone.

Lily soils are low in natural fertility and organic-matter content. They are strongly acid or very strongly acid throughout. Permeability is moderately rapid, and available water capacity is moderately low. The root zone is moderately deep and is easily penetrated by plant roots.

Included in mapping are a few areas of the Evard and Saluda soils on broad ridgetops. These areas range from 3 to 8 acres.

The soils in this map unit are wooded and have poor potential for upland oaks and pines. Steep slopes, stoniness, and low available water capacity are the main limitations for woodland management. Another concern is the hazard of erosion.

The soils in this map unit have poor potential for cultivated crops and for urban or recreational uses. The main limitations are low available water capacity, steep slopes, and stoniness.

This association is in capability subclass VIIs.

Rx—Rock outcrop. This map unit is 90 percent or more exposures of hard granite, granite gneiss, phyllite, or quartzite bedrock. It is on escarpments and steep and very steep areas on sides of the Blue Ridge Mountains. Individual areas range from 3 to 40 acres.

Included in mapping are pockets or crevasses of loamy and sandy material that has as much as 4 inches of organic material in some pockets. These areas make up about 10 percent of most map units. Scrubby trees and shrubs, grasses, mosses, and lichens are in the pockets and crevasses.

The material in this map unit has poor potential for most common uses. Because there is little or no soil overburden, however, it can be quarried and crushed and used as a source of construction material.

SAE—Saluda association, moderately steep. This map unit is made up of well drained, dominantly shallow mountain soils that formed in material weathered from granite, gniess, or schist. This association is on narrow, irregularly shaped ridgetops and long sides of mountains that range in elevation from 1,800 to 3,300 feet. Slopes commonly have a south and east aspect and range from 10 to 25 percent but mainly range from 15 to 25 percent. Mapped areas are regular in shape, repeating in pattern, and range from 10 to 60 acres.

A typical area of this association is 70 percent Saluda soils and soils that are closely similar to the Saluda soils but have less than 10 percent each of Edneyville, Evard, Lily, and Tusquitee soils. Saluda and similar soils are on narrow ridgetops and short mountainsides. The deep Edneyville and Evard soils and the moderately deep Lily soils are on long mountainsides. The Edneyville soils are on higher lying areas, and the Evard soils and Lily soils are on lower lying areas. The deep Tusquitee soils are in mountain coves and saddles and at foot slopes of the mountains.

Typically, Saluda soils have a brown fine sandy loam surface layer about 3 inches thick. The subsoil is yellowish red sandy clay loam about 12 inches thick. It is underlain by vari-colored, highly weathered granite, gneiss, or schist that extends to a depth of 60 inches or more. Hard rock is at a depth of 5 feet or more. Two to 15 percent stones and cobbles are throughout the soil.

Saluda soils are low in natural fertility and organic-matter content. They are strongly acid or very strongly acid throughout. Permeability is moderate, and available water capacity is low. The root zone is shallow.

The soils in this association have poor potential for cultivated crops because of slope and the hazard of erosion. They have fair potential for pasture.

The soils in this map unit have fair potential for shortleaf pine and eastern white pine. The hazard of erosion is the primary problem and can be overcome by good woodland management.

The soils in this association have poor potential for most urban and recreational uses. Slope is the main limitation.

This association is in capability subclass VIe.

SAF—Saluda association, steep. This map unit is made up of well drained, dominantly shallow mountain soils that formed in material weathered mainly from granite, gneiss, or schist. This association is on narrow ridgetops and sides of mountains that range in elevation from 1,800 to 3,300 feet. Slopes commonly have a south and east aspect and range from 25 to 50 percent. Mapped areas are regular in shape, repeating in pattern, and range from 10 to 250 acres.

In a typical area, this association is 60 percent Saluda soils and has less than 10 percent each of the Ashe, Edneyville, Evard, and Ramsey soils. Saluda soils are on narrow ridgetops and on short mountainsides. The moderately deep Ashe soils and the deep Edneyville soils are on the higher lying areas, the deep Evard soils and Ramsey soils are on the lower sides of mountains. Typically, Saluda soils have a brown fine sandy loam surface layer about 5 inches thick. The subsoil is yellowish red sandy clay loam about 11 inches thick. It is underlain by vari-colored, highly weathered granite, gneiss, or schist that extends to a depth of 5 feet or more. It is underlain by hard rock. Five to 15 percent stones and cobbles are throughout the soil.

Saluda soils are low in natural fertility and organic-matter content. They are strongly acid throughout. Permeability is moderate, and available water capacity is low. The root zone is shallow.

The soils in this association are used for mixed hardwood and pine forest. They have fair potential for Virginia pine, loblolly pine, and eastern white pine. Steep slopes and the hazard of erosion are the main limitations. Ice damage is a hazard along ridgetops of high elevations.

The soils in this map unit have poor potential for cultivated crops and for urban or recreational uses. Steep slope is the main limitation.

This association is in capability subclass VIIe.

SBG—Saluda and Ashe stony soils, very steep. This map unit is made up of shallow and moderately deep, well drained and somewhat excessively drained soils that formed in material weathered from granite, gneiss, and schist. These soils are on mountainsides that range in elevation from 1,800 to 4,500 feet. Slopes commonly have a south and east aspect and range from 50 to 90 percent. Individual areas of each soil are large enough to be mapped separately, but because of slopes and present and predicted use, they were mapped as one unit. Most mapped areas have both soils, but a few areas have only one of the soils. Mapped areas are irregular in pattern and range from 10 to 80 acres.

The shallow Saluda soils make up about 65 percent of a typical unit. The surface layer is brown stony fine sandy loam about 6 inches thick. The subsoil is yellowish red sandy clay loam about 11 inches thick. It is underlain by vari-colored highly weathered granite, gneiss, or schist. Hard rock is at a depth of 5 feet or more. Fifteen to 25 percent stones and cobbles are throughout the soil.

Saluda soils are low in natural fertility and organic-matter content. They are strongly acid or very strongly acid throughout. Permeability is moderate, and the available water capacity is low. The root zone is shallow.

The moderately deep Ashe soils make up about 15 percent of a typical map unit. Typically, the surface layer is brown stony sandy loam about 8 inches thick. The subsoil is strong brown sandy loam and extends to a depth of about 28 inches. Below this is saprolite. Gneissic bedrock is at a depth of about 36 inches. There is 10 to 15 percent surface stone by volume, and 15 to 25 percent coarse fragments within the soil.

Ashe soils are low in natural fertility and organic-matter content. They are strongly acid or very strongly acid throughout. Permeability is moderately rapid, and the available water capacity is low.

Included in mapping are small areas of soils that have a micaceous sandy loam subsoil. Also included are small areas of Rock outcrop and small areas that have boulders on the surface. These included soils make up about 15 percent of the map unit. Individual areas of each included soil range from 2 to 10 acres.

The soils in this map unit are in mixed hardwood and pine forest. They have fair potential for Virginia pine, loblolly pine, and eastern white pine. Very steep slopes, stoniness, boulders on the surface, and the hazard of erosion are limitations in harvesting and regeneration. Ice damage is also a hazard.

The soils in this map unit have poor potential for cultivated crops and for urban or recreational uses. Very steep slopes, stoniness, and boulders are main limitations.

These soils are in capability subclass VIIe.

To—Toccoa fine sandy loam. This deep, nearly level, well drained soil is on flood plains that are adjacent to the larger streams in valleys of mountains. There is a high probability of frequent brief flooding during winter and early in spring. Individual areas range from 3 to 30 acres.

Typically, the surface layer is dark brown fine sandy loam about 8 inches thick. It is underlain by dark yellowish brown sandy loam to a depth of about 30 inches. Below this, to a depth of about 46 inches, is dark grayish brown sandy loam. The underlying material, to a depth of 62 inches or more, is stratified gray and brown loamy sand.

This soil is medium in natural fertility and organic-matter content. It ranges from strongly acid to slightly acid throughout unless it has been limed. Permeability is moderately rapid, and available water capacity is medium. The water table is seasonally high and is within about 36 inches of the surface during winter and early spring. This soil has good tilth. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of intermingled Chatuge, Toxaway, and Transylvania soils. Also included are soils that are similar but have a thick, dark brown surface layer. The included soils make up about 15 percent of this map unit, but separate areas generally are less than 3 acres.

This soil has fair potential for row crops, truck crops, small grains, hay, and pasture. Potential is limited because of frequent flooding, small areas, and wetness of the adjacent flood plain soils.

This soil has good potential for yellow-poplar, loblolly pine, and eastern white pine. Frequent flooding late in winter and early in spring is the main limitation in managing and harvesting the tree crop. This can be overcome by using equipment and logging during the drier seasons.

This soil has poor potential for urban and most recreational uses. Flooding is the principal limitation and can be overcome by extensive flood control measures.

This soil is in capability subclass IIIw.

Tp—Toxaway silt loam. This deep, poorly drained, nearly level soil is on flood plains that are adjacent to the larger streams in valleys of the mountains. There is a high probability of frequent, very brief flooding during winter and spring. Individual areas range from 3 to 60 acres.

Typically, the surface layer is black silt loam about 28 inches thick. The underlying layers extend to a depth of 60 inches or more. The upper and middle layers are very dark gray. The upper layer is silt loam and the middle layer is loam. The lower layer is dark grayish brown loamy sand.

This soil is high in natural fertility and organic-matter content. It is medium acid throughout unless it has been limed. Permeability is moderate, and available water capacity is high. Tilth is good. The root zone is deep, but a water table is commonly at or near the surface during winter and early in spring.

Included with this soil in mapping are small areas of intermingled Chatuge and Transylvania soils. The included soils make up about 15 percent of this map unit, but separate areas generally are less than 3 acres.

This soil has good potential for row crops, truck crops (fig. 4), small grains, hay, and pasture. Potential is limited in places, because some areas are small. Most areas are drained, but wetness and flooding are a concern in a few places.

This soil has good potential for yellow-poplar, northern red oak, eastern white pine, green ash, white ash, and American sycamore. Flooding and wetness are limitations to equipment use in managing and harvesting the tree crop, but this can be overcome by using equipment and logging during the drier seasons.

This soil has poor potential for urban and recreational uses because of wetness and flooding.

This soil is in capability subclass IIw.

Tr—Transylvania-Toxaway complex. This map unit is made up of areas of Transylvania and Toxaway soils that are so intermingled that they could not be mapped separately at the scale selected for mapping. These nearly level, well drained to poorly drained soils are on moderately broad flood plains in the valleys of mountains. There is high probability of frequent, very brief, or brief flooding during winter and spring. Individual areas range from 10 to 80 acres. Individual areas of each soil range from 1 acre to 10 acres.

Transylvania silt loam makes up about 55 percent of each mapped area. Typically, moderately well drained or well drained Transylvania soils have a silt loam surface layer about 25 inches thick. It is very dark gray in the upper part, and very dark grayish brown in the lower part. The silt loam subsoil extends to a depth of 46 inches. It is brown in the upper part, dark brown with strong brown mottles in the middle part, and very dark gray with strong brown mottles in the lower part. Below is very dark gray stratified silt loam and sand.

Transylvania soils are high in natural fertility and organic-matter content. They are strongly acid throughout, unless they have been limed. Permeability is moderate, and available water capacity is high. The water table is seasonally high and is between 30 and 40 inches from the surface during winter and spring. Tilth is good. The root zone is deep and is easily penetrated by plant roots.

Poorly drained Toxaway silt loam makes up about 35 percent of each mapped area. Typically, the surface layer is black silt loam about 28 inches thick. The underlying layers extend to a depth of 60 inches or more. The upper and middle layers are very dark gray. The upper layer is silt loam and the middle layer is loam. The lower layer is dark grayish brown loamy sand.

Toxaway soils are high in natural fertility and organic-matter content. They are medium acid throughout, unless they have been limed. Permeability is moderate, and the available water capacity is high. Tilth is good. The root zone is deep, but a water table is commonly at or near the surface during winter and spring.

Included with this complex in mapping are small areas of the Toccoa and Chatuge soils.

The soils in this complex have good potential for row crops (fig. 5), truck crops, small grain, hay, and pasture. Wetness and flooding are a management concern. Potential is limited in places, because areas are small.

The soils in this map unit have good potential for yellow-poplar, eastern white pine, northern red oak, black walnut, and American sycamore. Flooding and wetness are limitations for equipment use in managing and harvesting the tree crop, but this limitation can be overcome by using equipment and logging during the drier seasons.

The soils in this map unit have poor potential for urban and recreational uses because of wetness and flooding. The soils that are better drained, however, are a good source of topsoil for landscaping and nursery use.

This complex is in capability subclass IIw.

TuC—Tusquitee loam, 4 to 10 percent slopes. This deep, well drained, gently sloping and sloping soil is on toe slopes, in coves, or in saddles of the mountains. This soil is at elevations that range from 1,700 to 4,200 feet. Slopes are commonly smooth and concave, but in places they are convex. They commonly have a northeast to northwest aspect. Individual areas range from 3 to 40 acres.

Typically, the surface layer is dark brown loam about 8 inches thick. The subsoil extends to a depth of 51 inches. It is brown loam in the upper part, strong brown clay loam in the middle part, and yellowish brown loam in the lower part. The underlying material, to a depth of 60 inches or more, is yellowish brown gravelly loam.

This soil is medium in natural fertility and organic-matter content. It is strongly acid throughout unless it has been limed. Permeability is moderate, and available water capacity is moderately high. This soil has good tilth and can be worked throughout a fairly wide range of moisture content. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few small areas that have slopes of more than 10 percent. Also included are a few small areas of intermingled Edneyville, Haywood, and Porters soils. The included soils make up about 10 percent of this map unit, but individual areas of each soil range from 1 to 3 acres.

This soil has good potential for row crops, truck crops, small grain, hay, and pasture. Potential is limited in places because of some small areas and the slope of adjacent soils. Good tilth is easily maintained by returning crop residue to the soil. The hazard of erosion is moderate for cultivated crops. Minimum tillage and the use of cover crops, including grasses and legumes in the cropping system, help reduce runoff and control erosion.

This soil has good potential for yellow-poplar, northern red oak, eastern white pine, black walnut, and loblolly pine. There are no significant limitations for woodland use or management.

This soil has good potential for most urban and recreational uses. Seepage is a limitation for sewage lagoons and sanitary landfills.

This soil is in capability subclass IIIe.

TuE—Tusquitee loam, 10 to 25 percent slopes. This deep, well drained, moderately steep soil is on toe slopes and in the coves or saddles of mountains. This soil is at elevations that range from 1,700 to 4,200 feet. Slopes are commonly smooth and concave, but they are convex in places. They commonly have a northeast to northwest aspect. Individual areas range from 5 to 120 acres.

Typically, the surface layer is loam about 12 inches thick. It is very dark grayish brown in the upper part and dark yellowish brown in the lower part. The subsoil extends to a depth of 72 inches or more. It is dark yellowish brown loam in the lower part and clay loam that is brown overlying dark yellowish brown in the lower part. A few angular pebbles are throughout the soil.

This soil is medium in natural fertility and organic-matter content. It is strongly acid throughout, unless it has been limed. Permeability is moderate, and available water capacity is medium. This soil has good tilth and can be worked throughout a fairly wide range of moisture content. The root zone is deep and is easily penetrated by plant roots.

Included with this soil in mapping are a few small areas that have slopes of less than 10 percent. Also included are a few small areas of intermingled Edneyville, Haywood, and Porters soils. These included soils make up about 15 percent of this mapping unit, but separate areas generally are less than 3 acres.

This soil has poor potential for row crops, truck crops, and small grain. Potential is mainly limited because of slope and the severe hazard of erosion. This soil has fair potential for hay and pasture.

This soil has good potential for yellow-poplar, northern red oak, eastern white pine, black walnut, and loblolly pine. The hazard of erosion can be overcome by good management.

This soil has poor potential for most urban and recreational uses because of slope.

This soil is in capability subclass VIe.

TVF—Tusquitee-Haywood association, steep. This map unit is made up of deep, well drained soils that formed in material washed from higher lying mountains. It is in coves, saddles, foot slopes, and drainageways at elevations that range from 2,600 to 4,200 feet. Slopes commonly have a northwest and northeast aspect and range from 25 to 45 percent. Haywood soils are commonly on the foot slopes of mountains and Tusquitee soils are commonly in the more concave areas beyond the Haywood soils. Most mapped areas are longer than they are broad. The widest part of the association is at the head of drainage systems. Mapped areas are regular in shape, repeating in pattern, and range from 40 to 200 acres or more.

Tusquitee soils make up about 60 percent of the association. Typically, the surface layer is dominantly dark reddish brown loam about 11 inches thick. The subsoil is dominantly dark yellowish brown and extends to a depth of 60 inches or more. It is fine sandy loam in the upper part, clay loam in the middle part, and loam in the lower part. There is as much as 15 percent stone content by volume throughout.

Tusquitee soils are medium in natural fertility and organic-matter content. They are medium acid throughout. Permeability is moderate, and available water capacity is high.

Haywood soils make up about 20 percent of the association. Typically, the surface layer extends to a depth of 36 inches. It is dominantly black stony loam in the upper part and dominantly dark brown stony fine sandy loam in the lower part. The subsoil is stony fine sandy loam and extends to a depth of 66 inches or more. It is brown in the upper part and dark yellowish brown in the lower part. Stones, cobbles, and boulders range from 15 to 30 percent by volume throughout.

Haywood soils are high in natural fertility and organic-matter content. They are medium acid throughout. Permeability is rapid, and available water capacity is high.

Included in mapping are soils that are similar to the Tusquitee soils but have about 15 to 35 percent stones by volume throughout the soil. Also included are soils that have slopes of 45 percent or more, small areas of Ashe, Edneyville, and Porters soils, and soils that are similar to the Haywood soils but are redder throughout. Springs, seepage areas, and rock flows are included in most mapped areas. The inclusions make up about 20 percent of this association.

The soils in this association have good potential for woodland. Northern red oak, white oak, yellow-poplar, and hemlock are the best species for management. Because these soils are in moist sites, the use of equipment needs to be restricted during wet seasons. Steep slopes and areas of stoniness are the main limitations for woodland management. The hazard of erosion can be overcome by good management.

The soils in this association have poor potential for cultivated crops and for urban or recreational uses. Steep slopes and stoniness are the main limitations.

This association is in capability subclass VIIe.

Use and management of the soils

The soil survey is a detailed inventory and evaluation of the most basic resource of the survey area—the soil.

It is useful in adjusting land use, including urbanization, to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in uses of the land.

While a soil survey is in progress, soil scientists, conservationists, engineers, and others keep extensive notes about the nature of the soils and about unique aspects of behavior of the soils. These notes include data on erosion, drought damage to specific crops, yield estimates, flooding, the functioning of septic tank disposal systems, and other factors affecting the productivity, potential, and limitations of the soils under various uses and management. In this way, field experience and measured data on soil properties and performance are used as a basis for predicting soil behavior.

Information in this section is useful in planning use and management of soils for crops and pasture and woodland; as sites for buildings, highways and other transportation systems, sanitary facilities, and parks and other recreation facilities; and for wildlife habitat. From the data presented, the potential of each soil for specified land uses can be determined, soil limitations to these land uses can be identified, and costly failures in houses and other structures, caused by unfavorable soil properties, can be avoided. A site where soil properties are favorable can be selected, or practices that will overcome the soil limitations can be planned.

Planners and others using the soil survey can evaluate the impact of specific land uses on the overall productivity of the survey area or other broad planning area and on the environment. Productivity and the environment are closely related to the nature of the soil. Plans should maintain or create a land-use pattern in harmony with the natural soil.

Contractors can find information that is useful in locating sources of sand and gravel, roadfill, and topsoil. Other information indicates the presence of bedrock, wetness, or very firm soil horizons that cause difficulty in excavation.

Health officials, highway officials, engineers, and many other specialists also can find useful information in this soil survey. The safe disposal of wastes, for example, is closely related to properties of the soil. Pavements, sidewalks, campsites, playgrounds, lawns, and trees and shrubs are influenced by the nature of the soil.

Crops and pasture

The major management concerns in the use of the soils for crops and pasture are described in this section. In addition, the crops or pasture plants best suited to the soil, including some not commonly grown in the survey area, are discussed; the system of land capability classification used by the Soil Conservation Service is explained; and the predicted yields of the main crops and hay and pasture plants are presented for each soil.

This section provides information about the overall agricultural potential of the survey area and about the management practices that are needed. The information is useful to equipment dealers, land improvement contractors, fertilizer companies, processing companies, planners, conservationists, and others. For each kind of soil, information about management is presented in the section "Soil maps for detailed planning." Planners of management systems for individual fields or farms should also consider the detailed information given in the description of each soil.

Soil erosion is the main concern on about one-half of the cropland and pasture in the survey area. If slope is more than 2 percent, erosion is a hazard.

Loss of the surface layer through erosion is damaging for two reasons. First, productivity is reduced as the surface layer is lost and part of the subsoil is incorporated into the plow layer. Loss of the surface layer is especially damaging on soils that have a clayey subsoil, for example, the Bradson, Dyke, Hayesville, and Rabun soils. Second, soil erosion on farmland results in sedimentation of streams. Control of erosion minimizes the pollution of streams by sediment and improves the quality of water for municipal use, for recreation, and for fish and wildlife.

In many sloping fields, tilling or preparing a good seedbed is difficult on clayey spots because the original friable surface soil has been eroded away. Such spots are in areas of Bradson, Dyke, and Hayesville soils.

Erosion control practices provide protective surface cover, reduce runoff, and increase infiltration. A cropping system that keeps plant cover on the soil for extended periods can hold soil erosion losses to amounts that will not reduce the productive capacity of the soils. On livestock farms, which require pasture and hay (fig. 6), the legume and grass forage crops in the cropping system reduce erosion on sloping land, provide nitrogen, and improve tilth for the following crop.

Slopes are so short and irregular that contour tillage or terracing is not practical in the survey area. On these soils, a cropping system that provides substantial plant cover is required to control erosion unless minimum tillage is practiced. Minimizing tillage and leaving crop residue on the surface help increase infiltration and reduce the hazards of runoff and erosion. These practices can be adapted to most soils in the survey area. No-tillage for corn, which is becoming increasely common, is effective in reducing erosion on sloping land and can be adapted to many soils in the survey area.

Terraces are diversions that reduce the length of slope and help control runoff and erosion. They are most practical on deep, well drained gently sloping or sloping soils. Bradson, Dillard, Dyke, Hayesville, and Tusquitee soils are suitable for terraces.

Soil drainage is the main management need on about 17,000 acres in the survey area. On some soils, for example, the poorly drained Chatuge soils, the production of crops common to the area generally is not possible because of wetness. These soils make up about 1,900 acres. On some soils, for example, the Chatuge, Toccoa, Toxaway, and Transylvania soils, crops are damaged during most years unless they are artificially drained and protected from flooding. These soils make up about 15,000 acres in the survey area.

The design of both surface and subsurface drainage systems varies with the kind of soil. A combination of surface drainage and tile drainage is needed in most areas of the poorly drained soils used for intensive row cropping. Drains need to be more closely spaced in slowly permeable soils than in more permeable soils. Tile drainage is slow in Chatuge soils. Although finding adequate outlets for tile drainage systems is difficult in some areas, such outlets mostly are available.

Information about erosion control practices and about proper drainage systems for each kind of soil is available in local offices of the Soil Conservation Service.

Soil fertility is naturally low in most soils on uplands in the survey area. All soils in the survey area are naturally acid. The soils on flood plains, for example, the Toccoa, Toxaway, and Transylvania soils, range from slightly acid to strongly acid.

Many soils on uplands are strongly acid or very strongly acid in their natural state. Ground limestone needs to be applied to raise the pH level for good growth of clovers and other crops because available phosphorus and potash levels are naturally low in most of these soils. On all soils the amount of lime and fertilizer to be applied should be based on the results of soil tests, on the need of the crop, and on the expected level of yields. The Cooperative Extension Serice can help in determining the kinds and amounts of fertilizer and lime to apply.

Soil tilth is an important factor in the germination of seeds and in the infiltration of water into the soil. Soils with good tilth are granular and porous.

Most of the soils used for crops in the survey area have a loamy surface layer that is low in content of organic matter. Generally the structure of such soils is weak, and intense rainfall causes the formation of a crust on the surface. This crust is hard when dry. Once the crust forms, it reduces infiltration and increases runoff. Regular additions of crop residue, manure, and other organic material help improve soil structure and reduce crust formation.

Fall plowing generally is not a good practice in the survey area. About 36,000 acres of the cropland consists of sloping soils that are subject to damaging erosion if they are plowed in the fall.

Many field crops suited to the soils and climate of the survey area now are not commonly grown. Corn and, to a lesser extent, soybeans, are the common row crops. Such truck crops as sweet corn, potatoes, green beans, and peppers can be grown.

Rye and barley are suited, and grass seed could be produced from fescue and orchardgrass.

Special crops grown commercially in the survey area are vegetables, small fruits, and nursery plants. In addition, other special crops, for example, blueberries, grapes, and apples could be grown. Apples are the most important tree fruits grown in the area.

Deep soils that have good natural drainage and that warm up early in spring are especially well suited to many vegetables and small fruits. The Bradson, Dyke, and Hayesville soils that have slopes of less than 10 percent are well suited to such crops. These soils make up about 12,000 acres.

If adequately drained and protected from flooding, most of the soils on flood plains, for example, the Toccoa, Toxaway, and Transylvania soils are suited to a wide range of vegetable crops. These soils make up about 14,000 acres in the survey area.

Most of the well drained soils in the survey area are suitable for orchards and nursery plants. Soils in low positions where frost is frequent and air drainage is poor, however, generally are poorly suited to early vegetables, small fruits, and orchards.

The local offices of the Soil Conservation Service and the Cooperative Extension Service can provide the latest information and suggestions about growing special crops.

Yields per acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. Absence of an estimated yield indicates that the crop is not suited to or not commonly grown on the soil or that a given crop is not commonly irrigated.

The estimated yields were based mainly on the experience and records of farmers, conservationists, and extension agents. Results of field trials and demonstrations and available yield data from nearby counties were also considered.

The yields were estimated assuming that the latest soil and crop management practices were used. Hay and pasture yields were estimated for the most productive varieties of grasses and legumes suited to the climate and the soil. A few farmers may be obtaining average yields higher than those shown in table 5.

The management needed to achieve the indicated yields of the various crops depends on the kind of soil and the crop. Such management provides drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate tillage practices, including time of tillage and seedbed preparation and tilling when soil moisture is favorable; control of weeds, plant diseases, and harmful insects; effective use of crop residues, barnyard manure, and green-manure crops; harvesting crops with the smallest possible loss; timeliness of all fieldwork; and favorable soil reaction and optimum levels of phosphorus, potassium, and trace elements for each crop. Accurate fertilizer recommendations for a particular soil and a particular crop can only be accomplished by soil testing. In the absence of a soil test, general fertilizer recommendations are available in Agriculture Circular 639 (*3*).

The estimated yields reflect the productive capacity of the soils for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not included because the acreage of these crops is small. The local offices of the Soil Conservation Service and the Cooperative Extension Service can provide information about the management concerns and productivity of the soils for these crops.

Capability classes and subclasses

Capability classes and subclasses show, in a general way, the suitability of soils for most kinds of field crops. The soils are classed according to their limitations when they are used for field crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to crops that require special management. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forest trees, or for engineering purposes.

In the capability system, all kinds of soil are grouped at three levels: capability class, subclass, and unit. Only the levels class and subclass are used in this soil survey. These levels are defined in the following paragraphs. A survey area may not have soils of all classes.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

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

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

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

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

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

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

Class VIII soils and landforms have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class; they are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use to pasture, woodland, wildlife habitat, or recreation.

The acreage of soils in each capability class and subclass is indicated in table 6. All soils in the survey area except Rock outcrop are included. Some of the soils that are well suited to crops and pasture may be in low-intensity use, for example, soils in capability classes II and III. Data in this table can be used to determine the farming potential of such soils.

The capability subclass is identified in the description of each soil mapping unit in the section "Soil maps for detailed planning."

Woodland

By Gary T. Bell, forester, and T.W. Green, soil scientist, Forest Service.

In 1972 about 90 percent of the total land area in Rabun and Towns Counties was in commercial forest. Of the total wooded acreage, about 64 percent was in the Chattahoochee National Forest and other publicly owned land, and the remaining 36 percent was held by private industrial owners.

The forest survey shows that within the two-county area, 51 percent of the total forested land is in the oak-hickory forest type, 22 percent is in the oak-pine forest type, 23 percent is in loblolly shortleaf pine forest type, and 4 percent is in white pine-hemlock forest type. Local markets for sawtimber and veneer are adequate for the current annual growth.

Although the demand for hardwood and softwood pulp has increased within the past few years, it is still limited because of the combination of difficult logging terrain and distance to market. Most of the small roundwood from the two-county area is shipped out of the state. Adequate forest fire protection provided to all lands in the past few years has increased the interest in good forestry and has raised the standards for forestry practices.

Table 7 contains information useful in the planning, management, and use of woodland crops. Map unit symbols for the soils that are suitable for woodland crops are listed alphabetically, preferred and acceptable tree species are listed, potential productivity is given, and major management concerns are recognized.

Preferred species indicates the major species to be managed in existing stands, planted, or encouraged in natural regeneration. Management considerations, however, may indicate different species preference.

Potential productivity of the commercially important trees suitable on each soil is expressed as prevailing site index, which is the total height, in feet, that the most desirable (dominant and codominant) trees of a given species, growing on a specified soil, will reach in 50 years. The estimates of site indexes given are based on measurements of trees of different species, on published and unpublished records, and on measurements taken in the two counties and also in the immediate surrounding counties. *Optimum annual growth* varies with both the species and the site index. For the greatest volume of either pulpwood or sawtimber, the stand needs to be harvested at the indicated age and a new crop begun. For sawtimber, particularly hardwoods, quality timber produced by larger trees commands higher stumpage prices. Where this is the case, stands on sites where the site index is more than 80 can be left for 10 to 30 years longer to take advantage of this economic increase. This situtation is most common in cove hardwood sites on Dyke loam, 10 to 25 percent slopes, Tusquitee loam, 10 to 25 percent slopes, and on Tusquitee-Haywood association, steep.

Acceptable species indicates the species tolerated in mixtures with preferred species. Management considerations, however, may indicate different species preference.

Equipment limitations are rated according to the degree that some soil characteristics and topographic features restrict the use of conventional equipment for preparing sites, planting and harvesting wood crops, constructing roads, and controlling fires. The limitation is slight if there is little or no restriction on the type of equipment that can be used or on the time of the year that the equipment can be used. It is moderate if the use of equipment is restricted by one or more unfavorable characteristics, such as slope, stones, or other obstructions; seasonal wetness; instability; or risk of injury to roots of trees. The limitation is severe if special equipment is needed and if the use of such equipment is severely restricted by one or more unfavorable soil characteristics.

Erosion hazard refers to the degree of limitation placed on the production of wood crops as a result of potential erosion if the soils are used as woodland and if the soils are managed according to acceptable standards. The hazard is slight if the problems of erosion control are not great; moderate if some attention must be given to controlling erosion; and severe if intensive management, special equipment, and special methods of operation must be planned to protect the soils.

Seedling mortality is minimal in the two county area and is not a factor in management. Plant competition is slight, so no ratings were developed to express degrees of plant competition.

In harvesting and regeneration, necessary action must be taken at all times to minimize the concentration of water, especially in skid trails, logging decks, and existing gullies. When logging operations are completed, temporary roads should be shaped, waterbarred, and properly vegetated.

Engineering

This section provides information about the use of soils for building sites, sanitary facilities, construction material, and water management. Among those who can benefit from this information are engineers, landowners, community planners, town and city managers, land developers, builders, contractors, and farmers and ranchers.

The ratings in the engineering tables are based on test data and estimated data in the "Soil properties" section. The ratings were determined jointly by soil scientists and engineers of the Soil Conservation Service using known relationships between the soil properties and the behavior of soils in various engineering uses.

Among the soil properties and site conditions identified by a soil survey and used in determining the ratings in this section were grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock that is within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure or aggregation, in-place soil density, and geologic origin of the soil material. Where pertinent, data about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of absorbed cations were also considered.

On the basis of information assembled about soil properties, ranges of values can be estimated for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, shear strength, compressibility, slope stability, and other factors of expected soil behavior in engineering uses. As appropriate, these values can be applied to each major horizon of each soil or to the entire profile.

These factors of soil behavior affect construction and maintenance of roads, airport runways, pipelines, foundations for small buildings, ponds and small dams, irrigation projects, drainage systems, sewage and refuse disposal systems, and other engineering works. The ranges of values can be used to (1) select potential residential, commercial, industrial, and recreational uses; (2) make preliminary estimates pertinent to construction in a particular area; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for location of sanitary landfills, onsite sewage disposal systems, and other waste disposal facilities; (5) plan detailed onsite investigations of soils and geology; (6) find sources of gravel, sand, clay, and topsoil; (7) plan farm drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; (8) relate performance of structures already built to the properties of the kinds of soil on which they are built so that performance of similar structures on the same or a similar soil in other locations can be predicted; and (9) predict the trafficability of soils for cross-country movement of vehicles and construction equipment.

Data presented in this section are useful for land-use planning and for choosing alternative practices or general designs that will overcome unfavorable soil properties and minimize soil-related failures. Limitations to the use of these data, however, should be well understood. First, the data are generally not presented for soil material below a depth of 5 or 6 feet. Also, because of the scale of the detailed map in this soil survey, small areas of soils that differ from the dominant soil may be included in mapping. Thus, these data do not eliminate the need for onsite investigations, testing, and analysis by personnel having expertise in the specific use contemplated.

The information is presented mainly in tables. Table 8 shows, for each kind of soil, the degree and kind of limitations for building site development; table 9, for sanitary facilities; and table 11, for water management. Table 10 shows the suitability of each kind of soil as a source of construction materials.

The information in the tables, along with the soil map, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations and to construct interpretive maps for specific uses of land.

Some of the terms used in this soil survey have a special meaning in soil science. Many of these terms are defined in the Glossary.

Building site development

The degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, and local roads and streets are indicated in table 8. A *slight* limitation indicates that soil properties generally are favorable for the specified use; any limitation is minor and easily overcome. A *moderate* limitation indicates that soil properties and site features are unfavorable for the specified use, but the limitations can be overcome or minimized by special planning and design. A *severe* limitation indicates that one or more soil properties or site features are so unfavorable or difficult to overcome that a major increase in construction effort, special design, or intensive maintenance is required. For some soils rated severe, such costly measures may not be feasible.

Shallow excavations are made for pipelines, sewerlines, communications and power transmission lines, basements, open ditches, and cemeteries. Such digging or trenching is influenced by soil wetness caused by a seasonal high water table; the texture and consistence of soils; the tendency of soils to cave in or slough; and the presence of very firm, dense soil layers, bedrock, or large stones. In addition, excavations are affected by slope of the soil and the probability of flooding. Ratings do not apply to soil horizons below a depth of 6 feet unless otherwise noted.

In the soil series descriptions, the consistence of each soil horizon is given, and the presence of very firm or extremely firm horizons, usually difficult to excavate, is indicated.

Dwellings and *small commercial buildings* referred to in table 8 are built on undisturbed soil and have foundation loads of a dwelling no more than three stories high. Separate ratings are made for small commercial buildings without basements and for dwellings with and without basements. For such structures, soils should be sufficiently stable that cracking or subsidence of the structure from settling or shear failure of the foundation does not occur. These ratings were determined from estimates of the shear strength, compressibility, and shrink-swell potential of the soil. Soil texture, plasticity and in-place density, potential frost action, soil wetness, and depth to a seasonal high water table were also considered. Soil wetness and depth to a seasonal high water table indicate potential difficulty in providing adequate drainage for basements, lawns, and gardens. Depth to bedrock, slope, and large stones in or on the soil are also important considerations in the choice of sites for these structures and were considered in determining the ratings. Susceptibility to flooding is a serious hazard.

Local roads and streets referred to in table 8 have an all-weather surface that can carry light to medium traffic all year. They consist of a subgrade of the underlying soil material; a base of gravel, crushed rock fragments, or soil material stabilized with lime or cement; and a flexible or rigid surface, commonly asphalt or concrete. The roads are graded with soil material at hand, and most cuts and fills are less than 6 feet deep.

The load supporting capacity and the stability of the soil as well as the quantity and workability of fill material available are important in design and construction of roads and streets. The classifications of the soil and the soil texture, density, shrink-swell potential, and potential frost action are indicators of the traffic supporting capacity used in making the ratings. Soil wetness, flooding, slope, depth to hard rock or very compact layers, and content of large stones affect stability and ease of excavation.

Sanitary facilities

Favorable soil properties and site features are needed for proper functioning of septic tank absorption fields, sewage lagoons, and sanitary landfills. The nature of the soil is important in selecting sites for these facilities and in identifying limiting soil properties and site features to be considered in design and installation. Also, those soil properties that affect ease of excavation or installation of these facilities will be of interest to contractors and local officials. Table 9 shows the degree and kind of limitations of each soil for such uses and for use of the soil as daily cover for landfills. It is important to observe local ordinances and regulations.

If the degree of soil limitation is expressed as *slight*, soils are generally favorable for the specified use and limitations are minor and easily overcome; if *moderate*, soil properties or site features are unfavorable for the specified use, but limitations can be overcome by special planning and design; and if *severe*, soil properties or site features are so unfavorable or difficult to overcome that major soil reclamation, special designs, or intensive maintenance is required. Soil suitability is rated by the terms *good*, *fair*, or *poor*, which, respectively, mean about the same as the terms *slight*, *moderate*, and *severe*.

Septic tank absorption fields are subsurface systems of tile or perforated pipe that distribute effluent from a septic tank into the natural soil. Only the soil horizons between depths of 18 and 72 inches are evaluated for this use. The soil properties and site features considered are those that affect the absorption of the effluent and those that affect the construction of the system.

Properties and features that affect absorption of the effluent are permeability, depth to seasonal high water table, depth to bedrock, and susceptibility to flooding. Stones, boulders, and shallowness to bedrock interfere with installation. Excessive slope can cause lateral seepage and surfacing of the effluent. Also, soil erosion and soil slippage are hazards if absorption fields are installed on sloping soils.

In some soils, loose sand and gravel or fractured bedrock is less than 4 feet below the tile lines. In these soils the absorption field does not adequately filter the effluent, and ground water in the area may be contaminated.

On many of the soils that have moderate or severe limitations for use as septic tank absorption fields, a system to lower the seasonal water table can be installed or the size of the absorption field can be increased so that performance is satisfactory.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons have a nearly level floor and cut slopes or embankments of compacted soil material. Aerobic lagoons generally are designed to hold sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Soils that are very high in content of organic matter and those that have cobbles, stones, or boulders are not suitable. Unless the soil has very slow permeability, contamination of ground water is a hazard where the seasonal high water table is above the level of the lagoon floor. In soils where the water table is seasonally high, seepage of ground water into the lagoon can seriously reduce the lagoon's capacity for liquid waste. Slope, depth to bedrock, and susceptibility to flooding also affect the suitability of sites for sewage lagoons or the cost of construction. Shear strength and permeability of compacted soil material affect the performance of embankments.

Sanitary landfill is a method of disposing of solid waste by placing refuse in successive layers either in excavated trenches or on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil material. Landfill areas are subject to heavy vehicular traffic. Risk of polluting ground water and trafficability affect the suitability of a soil for this use. The best soils have a loamy or silty texture, have moderate to slow permeability, are deep to a seasonal water table, and are not subject to flooding. Clayey soils are likely to be sticky and difficult to spread. Sandy or gravelly soils generally have rapid permeability, which might allow noxious liquids to contaminate ground water. Soil wetness can be a limitation, because operating heavy equipment on a wet soil is difficult. Seepage into the refuse increases the risk of pollution of ground water.

Ease of excavation affects the suitability of a soil for the trench type of landfill. A suitable soil is deep to bedrock and free of large stones and boulders. If the seasonal water table is high, water will seep into trenches.

Unless otherwise stated, the limitations in table 9 apply only to the soil material within a depth of about 6 feet. If the trench is deeper, a limitation of slight or moderate may not be valid. Site investigation is needed before a site is selected.

Daily cover for landfill should be soil that is easy to excavate and spread over the compacted fill in wet and dry periods. Soils that are loamy or silty and free of stones or boulders are better than other soils. Clayey soils may be sticky and difficult to spread; sandy soils may be subject to soil blowing.

The soils selected for final cover of landfills should be suitable for growing plants. Of all the horizons, the A horizon in most soils has the best workability, more organic matter, and the best potential for growing plants. Thus, for either the area- or trench-type landfill, stockpiling material from the A horizon for use as the surface layer of the final cover is desirable.

Where it is necessary to bring in soil material for daily or final cover, thickness of suitable soil material available and depth to a seasonal high water table in soils surrounding the sites should be evaluated. Other factors to be evaluated are those that affect reclamation of the borrow areas. These factors include slope, erodibility, and potential for plant growth.

Construction materials

The suitability of each soil as a source of roadfill, sand, gravel, and topsoil is indicated in table 10 by ratings of good, fair, or poor. The texture, thickness, and organic-matter content of each soil horizon are important factors in rating soils for use as construction materials. Each soil is evaluated to the depth observed, generally about 6 feet.

Roadfill is soil material used in embankments for roads. Soils are evaluated as a source of roadfill for low embankments, which generally are less than 6 feet high and less exacting in design than high embankments. The ratings reflect the ease of excavating and working the material and the expected performance of the material where it has been compacted and adequately drained. The performance of soil after it is stabilized with lime or cement is not considered in the ratings, but information about some of the soil properties that influence such performance is given in the descriptions of the soil series.

The ratings apply to the soil material between the A horizon and a depth of 5 to 6 feet. It is assumed that soil horizons will be mixed during excavation and spreading. Many soils have horizons of contrasting suitability within their profile. The estimated engineering properties in table 14 provide specific information about the nature of each horizon. This information can help determine the suitability of each horizon for roadfill.

Soils rated *good* are coarse grained. They have low shrink-swell potential, low potential frost action, and few cobbles and stones. They are at least moderately well drained and have slopes of 15 percent or less. Soils rated *fair* have a plasticity index of less than 15 and have other limiting features, such as moderate shrink-swell potential, moderately steep slopes, wetness, or many stones. If the thickness of suitable material is less than 3 feet, the entire soil is rated *poor*.

Sand and *gravel* are used in great quantities in many kinds of construction. The ratings in table 10 provide guidance as to where to look for probable sources and are based on the probability that soils in a given area contain sizable quantities of sand or gravel. A soil rated *good* or *fair* has a layer of suitable material at least 3 feet thick, the top of which is within a depth of 6 feet. Coarse fragments of soft bedrock material, such as shale and siltstone, are not considered to be sand and gravel. Fine-grained soils are not suitable sources of sand and gravel.

The ratings do not take into account depth to the water table or other factors that affect excavation of the material. Descriptions of grain size, kinds of minerals, reaction, and stratification are given in the soil series descriptions and in table 14.

Topsoil is used in areas where vegetation is to be established and maintained. Suitability is affected mainly by the ease of working and spreading the soil material in preparing a seedbed and by the ability of the soil material to support plantlife. Also considered is the damage that can result at the area from which the topsoil is taken.

The ease of excavation is influenced by the thickness of suitable material, wetness, slope, and amount of stones. The ability of the soil to support plantlife is determined by texture, structure, and the amount of soluble salts or toxic substances. Organic matter in the A1 or Ap horizon greatly increases the absorption and retention of moisture and nutrients. Therefore, the soil material from these horizons should be carefully preserved for later use.

Soils rated *good* have at least 16 inches of friable loamy material at their surface. They are free of stones and cobbles, are low in content of gravel, and have gentle slopes. They are low in soluble salts that can limit or prevent plant growth. They are naturally fertile or respond well to fertilizer. They are not so wet that excavation is difficult during most of the year.

Soils rated *fair* are loose sandy soils or firm loamy or clayey soils in which the suitable material is only 8 to 16 inches thick or soils that have appreciable amounts of gravel, stones, or soluble salt.

Soils rated *poor* are very sandy soils and very firm clayey soils; soils with suitable layers less than 8 inches thick; soils having large amounts of gravel, stones, or soluble salt; steep soils; and poorly drained soils.

Although a rating of *good* is not based entirely on high content of organic matter, a surface horizon is generally preferred for topsoil because of its organic-matter content. This horizon is designated as A1 or Ap in the soil series descriptions. The absorption and retention of moisture and nutrients for plant growth are greatly increased by organic matter.

Water management

Many soil properties and site features that affect water management practices have been identified in this soil survey. In table 11 the degree of soil limitation and soil and site features that affect use are indicated for each kind of soil. This information is significant in planning, installing, and maintaining water control structures.

Soil and site limitations are expressed as slight, moderate, and severe. *Slight* means that the soil properties and site features are generally favorable for the specified use and that any limitation is minor and easily overcome. *Moderate* means that some soil properties or site features are unfavorable for the specified use but can be overcome or modified by special planning and design. *Severe* means that the soil properties and site features are so unfavorable and so difficult to correct or overcome that major soil reclamation, special design, or intensive maintenance is required.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have a low seepage potential, which is determined by permeability and the depth to fractured or permeable bedrock or other permeable material.

Embankments, dikes, and levees require soil material that is resistant to seepage, erosion, and piping and has favorable stability, shrink-swell potential, shear strength, and compaction characteristics. Large stones and organic matter in a soil downgrade the suitability of a soil for use in embankments, dikes, and levees.

Drainage of soil is affected by such soil properties as permeability; texture; depth to bedrock, hardpan, or other layers that affect the rate of water movement; depth to the water table; slope; stability of ditchbanks; susceptibility to flooding; salinity and alkalinity; and availability of outlets for drainage.

Irrigation is affected by such features as slope, susceptibility to flooding, hazards of water erosion and soil blowing, texture, presence of salts and alkali, depth of root zone, rate of water intake at the surface, permeability of the soil below the surface layer, available water capacity, need for drainage, and depth to the water table.

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

Grassed waterways are constructed to channel runoff to outlets at a nonerosive velocity. Features that affect the use of soils for waterways are slope, permeability, erodibility, wetness, and suitability for permanent vegetation.

Recreation

The soils of the survey area are rated in table 12 according to limitations that affect their suitability for recreation uses. The ratings are based on such restrictive soil features as flooding, wetness, slope, and texture of the surface layer. Not considered in these ratings, but important in evaluating a site, are location and accessibility of the area, size and shape of the area and its scenic quality, the ability of the soil to support vegetation, access to water, potential water impoundment sites available, and either access to public sewerlines or capacity of the soil to absorb septic tank effluent. Soils subject to flooding are limited, in varying degree, for recreation use by the duration and intensity of flooding and the season when flooding occurs. Onsite assessment of height, duration, intensity, and frequency of flooding is essential in planning recreation facilities.

The degree of the limitation of the soils is expressed as slight, moderate, or severe. *Slight* means that the soil properties are generally favorable and that the limitations are minor and easily overcome. *Moderate* means that the limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 12 can be supplemented by information in other parts of this survey. Especially helpful are interpretations for septic tank absorption fields, given in table 9, and interpretations for dwellings without basements and for local roads and streets, given in table 8.

Camp areas require such site preparation as shaping and leveling for tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines (fig. 7). Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils for this use have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing camping sites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for use as picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that will increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones or boulders, is firm after rains, and is not dusty when dry. If shaping is required to obtain a uniform grade, the depth of the soil over bedrock or hardpan should be enough to allow necessary grading.

Paths and trails for walking, horseback riding, bicycling, and other uses should require little or no cutting and filling. The best soils for this use are those that are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once during the annual period of use. They should have moderate slopes and have few or no stones or boulders on the surface.

Wildlife habitat

Jesse Mercer, Jr., biologist, Soil Conservation Service, assisted in preparing this section.

The soils in Rabun and Towns Counties are suited for and support several kinds of wildlife. Some species inhabit woodlands and farmland; some species require an aquatic habitat. Some animals eat only insects or other animals for foods; some require only vegetation; and others prefer a combination of these.

Quail, dove, rabbit, squirrel, fox, opossum, racoon, and many non-game birds are common throughout the survey area. Many farms have suitable sites for small fishponds. Deer, turkey, and grouse require extensive tracts of woodland, and water must be abundant. The long, narrow flood plains along the larger streams are well suited to migratory duck, native wood ducks, muskrat, and beaver. Beaver dams are common along many of these streams.

Soils directly affect the kind and amount of vegetation that is available to wildlife as food and cover, and they affect the construction of water impoundments. The kind and abundance of wildlife that populate an area depend largely on the amount and distribution of food, cover, and water. If any one of these elements is missing, is inadequate, or is inaccessible, wildlife either are scarce or do not inhabit the area.

If the soils have the potential, wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by helping the natural establishment of desirable plants.

In table 13, the soils in the survey area are rated according to their potential to support the main kinds of wildlife habitat in the area. This information can be used in planning for parks, wildlife refuges, nature study areas, and other developments for wildlife; selecting areas that are suitable for wildlife; selecting soils that are suitable for creating, improving, or maintaining specific elements of wildlife habitat; and determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* means that the element of wildlife habitat or the kind of habitat is easily created, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected if the soil is used for the designated purpose. A rating of *fair* means that the element of wildlife habitat or kind of habitat can be created, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* means that limitations are severe for the designated element or kind of wildlife habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* means that restrictions for the element of wildlife habitat or kind of wildlife are very severe, and that unsatisfactory results can be expected. Wildlife habitat is impractical or even impossible to create, improve, or maintain on soils having such a rating.

The elements of wildlife habitat are briefly described in the following paragraphs.

Grain and seed crops are seed-producing annuals used by wildlife. The major soil properties that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic grasses and herbaceous legumes that are planted for wildlife food and cover. Major soil properties that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses, legumes, and forbs that provide food and cover for wildlife. Major soil properties that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, and grama.

Hardwood trees and the associated woody understory provide cover for wildlife and produce nuts or other fruit, buds, catkins, twigs, bark, or foliage that wildlife eat. Major soil properties that affect growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of native plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are commercially available for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Coniferous plants are cone-bearing trees, shrubs, or ground cover plants that furnish habitat or supply food in the form of browse, seeds, or fruitlike cones. Soil properties that have a major effect on the growth of coniferous plants are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites, exclusive of submerged or floating aquatics. They produce food or cover for wildlife that use wetland as habitat. Major soil properties affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, and rushes, sedges, and reeds.

Shallow water areas are bodies of water that have an average depth of less than 5 feet and that are useful to wildlife. They can be naturally wet areas, or they can be created by dams or levees or by water-control structures in marshes or streams. Major soil properties affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. The availability of a dependable water supply is important if water areas are to be developed. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The kinds of wildlife habitat are briefly described in the following paragraphs.

Openland habitat consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The kinds of wildlife attracted to these areas include bobwhite quail, meadowlark, field sparrow, cottontail rabbit, and red fox.

Woodland habitat consists of areas of hardwoods or conifers, or a mixture of both, and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, deer, and bear.

Wetland habitat consists of open, marshy or swampy, shallow water areas where water-tolerant plants grow. Some of the wildlife attracted to such areas are ducks, geese, herons, muskrat, mink, and beaver.

Soil properties

Extensive data about soil properties are summarized on the following pages. The two main sources of these data are the many thousands of soil borings made during the course of the survey and the laboratory analyses of selected soil samples from typical profiles.

In making soil borings during field mapping, soil scientists can identify several important soil properties. They note the seasonal soil moisture condition or the presence of free water and its depth. For each horizon in the profile, they note the thickness and color of the soil material; the texture, or amount of clay, silt, sand, and gravel or other coarse fragments; the structure, or the natural pattern of cracks and pores in the undisturbed soil; and the consistence of the soil material in place under the existing soil moisture conditions. They record the depth of plant roots, determine the pH or reaction of the soil, and identify any free carbonates.

Samples of soil material are analyzed in the laboratory to verify the field estimates of soil properties and to determine all major properties of key soils, especially properties that cannot be estimated accurately by field observation. Laboratory analyses are not conducted for all soil series in the survey area, but laboratory data for many soil series not tested are available from nearby survey areas.

The available field and laboratory data are summarized in tables. The tables give the estimated range of engineering properties, the engineering classifications, and the physical and chemical properties of each major horizon of each soil in the survey area. They also present data about pertinent soil and water features, and engineering test data.

Engineering properties

Table 14 gives estimates of engineering properties and classifications for the major horizons of each soil in the survey area.

Most soils have, within the upper 5 or 6 feet, horizons of contrasting properties. Table 14 gives information for each of these contrasting horizons in a typical profile. *Depth* to the upper and lower boundaries of each horizon is indicated. More information about the range in depth and about other properties in each horizon is given for each soil series in the section "Soil series and morphology."

Texture is described in table 14 in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in soil material that is less than 2 millimeters in diameter. "Loam," for example, is soil material that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If a soil contains gravel or other particles coarser than sand, an appropriate modifier is added, for example, "gravelly loam." Other texture terms are defined in the Glossary.

The two systems commonly used in classifying soils for engineering use are the Unified Soil Classification System (Unified) (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO) (*1*).

The *Unified* system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter, plasticity index, liquid limit, and organic-matter content. Soils are grouped into 15 classes—eight classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils, identified as ML, CL, OL, MH, CH, and OH; and one class of highly organic soils, identified as Pt. Soils on the borderline between two classes have a dual classification symbol, for example, CL-ML.

The *AASHTO* system classifies soils according to those properties that affect their use in highway construction and maintenance. In this system a mineral soil is classified in one of seven basic groups ranging from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines. At the other extreme, in group A-7, are fine-grained soils. Highly organic soils are classified in group A-8 on the basis of visual inspection.

When laboratory data are available, the A-1, A-2, and A-7 groups are further classified as follows: A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, and A-7-6. As an additional refinement, the desirability of soils as subgrade material can be indicated by a group index number. These numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested in the survey area, with group index numbers in parentheses, is given in table 17. The estimated classification, without group index numbers, is given in table 14. Also in table 14 the percentage, by weight, of rock fragments more than 3 inches in diameter is estimated for each major horizon. These estimates are determined mainly by observing volume percentage in the field and then converting that, by formula, to weight percentage.

Percentage of the soil material less than 3 inches in diameter that passes each of four sieves (U.S. standard) is estimated for each major horizon. The estimates are based on tests of soils that were sampled in the survey area and in nearby areas and on field estimates from many borings made during the survey.

Liquid limit and *plasticity index* indicate the effect of water on the strength and consistence of soil. These indexes are used in both the Unified and AASHTO soil classification systems. They are also used as indicators in making general predictions of soil behavior. Range in liquid limit and plasticity index are estimated on the basis of test data from the survey area or from nearby areas and on observations of the many soil borings made during the survey.

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

Physical and chemical properties

Table 15 shows estimated values for several soil characteristics and features that affect behavior of soils in engineering uses. These estimates are given for each major horizon, at the depths indicated, in the typical pedon of each soil. The estimates are based on field observations and on test data for these and similar soils.

Permeability is estimated on the basis of known relationships among the soil characteristics observed in the field—particularly soil structure, porosity, and gradation or texture—that influence the downward movement of water in the soil. The estimates are for vertical water movement when the soil is saturated. Not considered in the estimates is lateral seepage or such transient soil features as plowpans and surface crusts. Permeability of the soil is an important factor to be considered in planning and designing drainage systems, in evaluating the potential of soils for septic tank systems and other waste disposal systems, and in many other aspects of land use and management.

Available water capacity is rated on the basis of soil characteristics that influence the ability of the soil to hold water and make it available to plants. Important characteristics are content of organic matter, soil texture, and soil structure. Shallow-rooted plants are not likely to use the available water from the deeper soil horizons. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design of irrigation systems.

Soil reaction is expressed as a range in pH values. The range in pH of each major horizon is based on many field checks. For many soils, the values have been verified by laboratory analyses. Soil reaction is important in selecting the crops, ornamental plants, or other plants to be grown; in evaluating soil amendments for fertility and stabilization; and in evaluating the corrosivity of soils.

Shrink-swell potential depends mainly on the amount and kind of clay in the soil. Laboratory measurements of the swelling of undisturbed clods were made for many soils. For others the swelling was estimated on the basis of the kind and amount of clay in the soil and on measurements of similar soils. The size of the load and the magnitude of the change in soil moisture content also influence the swelling of soils. Shrinking and swelling of some soils can cause damage to building foundations, basement walls, roads, and other structures unless special designs are used. A high shrink-swell potential indicates that special design and added expense may be required if the planned use of the soil will not tolerate large volume changes.

Erosion factors are used to predict the erodibility of a soil and its tolerance to erosion in relation to specific kinds of land use and treatment. The soil erodibility factor (K) is a measure of the susceptibility of the soil to erosion by water. Soils having the highest K values are the most erodible. K values range from 0.10 to 0.64. To estimate annual soil loss per acre, the K value of a soil is modified by factors representing plant cover, grade and length of slope, management practices, and climate. The soil-loss tolerance factor (T) is the maximum rate of soil erosion, whether from rainfall or soil blowing, that can occur without reducing crop production or environmental quality. The rate is expressed in tons of soil loss per acre per year.

Soil and water features

Table 16 contains information helpful in planning land uses and engineering projects that are likely to be affected by soil and water features.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are placed in one of four groups on the basis of the intake of water after the soils have been wetted and have received precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist chiefly of deep, well drained to excessively drained sands or gravels. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils that have a layer that impedes the downward movement of water or soils that have moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clay soils that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding is the temporary covering of soil with water from overflowing streams, with runoff from adjacent slopes, and by tides. Water standing for short periods after rains or after snow melts is not considered flooding, nor is water in swamps and marshes. Flooding is rated in general terms that describe the frequency and duration of flooding and the time of year when flooding is most likely. The ratings are based on evidence in the soil profile of the effects of flooding, namely thin strata of gravel, sand, silt, or, in places, clay deposited by floodwater; irregular decrease in organic-matter content with increasing depth; and absence of distinctive soil horizons that form in soils of the area that are not subject to flooding. The ratings are also based on local information about floodwater levels in the area and the extent of flooding; and on information that relates the position of each soil on the landscape to historic floods.

The generalized description of flood hazards is of value in land-use planning and provides a valid basis for land-use restrictions. The soil data are less specific, however, than those provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table is the highest level of a saturated zone more than 6 inches thick for a continuous period of more than 2 weeks during most years. The depth to a seasonal high water table applies to undrained soils. Estimates are based mainly on the relationship between grayish colors or mottles in the soil and the depth to free water observed in many borings made during the course of the soil survey. Indicated in table 16 are the depth to the seasonal high water table; the kind of water table, that is, perched, artesian, or apparent; and the months of the year that the water table commonly is high. Only saturated zones above a depth of 5 or 6 feet are indicated.

Information about the seasonal high water table helps in assessing the need for specially designed foundations, the need for specific kinds of drainage systems, and the need for footing drains to insure dry basements. Such information is also needed to decide whether or not construction of basements is feasible and to determine how septic tank absorption fields and other underground installations will function. Also, a seasonal high water table affects ease of excavation.

Depth to bedrock is shown for all soils that are underlain by bedrock at a depth of 5 to 6 feet or less. For many soils, the limited depth to bedrock is a part of the definition of the soil series. The depths shown are based on measurements made in many soil borings and on other observations during the mapping of the soils. The kind of bedrock and its hardness as related to ease of excavation is also shown. Rippable bedrock can be excavated with a single-tooth ripping attachment on a 200-horsepower tractor, but hard bedrock generally requires blasting.

Risk of corrosion pertains to potential soil-induced chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to soil moisture, particle-size distribution, total acidity, and electrical conductivity of the soil material. The rate of corrosion of concrete is based mainly on the sulfate content, texture, and acidity of the soil. Protective measures for steel or more resistant concrete help to avoid or minimize damage resulting from the corrosion. Uncoated steel intersecting soil boundaries or soil horizons is more susceptible to corrosion than an installation that is entirely within one kind of soil or within one soil horizon.

Engineering test data

The results of analyses of engineering properties of several typical soils of the survey area are given in table 17.

The data presented are for soil samples that were collected from carefully selected sites. The soil profiles sampled are typical of the series discussed in the section "Soil series and morphology." The soil samples were analyzed by the Department of Transportation, State of Georgia Office of Materials and Research.

The methods used in obtaining the data are listed by code in the next paragraph. Most of the codes, in parentheses, refer to the methods assigned by the American Association of State Highway and Transportation Officials (*1*). The code for Unified classification was assigned by the American Society for Testing and Materials (2).

The methods and codes are AASHTO classification (M-145); Unified classification (D-2487); Grain size distribution (T88); liquid limit (T89); plasticity index (T90); moisture density (T99); volume change.

Soil series and morphology

In this section, each soil series recognized in the survey area is described in detail. The descriptions are arranged in alphabetic order by series name.

Characteristics of the soil and the material in which it formed are discussed for each series. The soil is then compared to similar soils and to nearby soils of other series. Then a pedon, a small three-dimensional area of soil that is typical of the soil series in the survey area, is described. The detailed descriptions of each soil horizon follow standards in the Soil Survey Manual (*6*). Unless otherwise noted, colors described are for moist soil.

Following the pedon description is the range of important characteristics of the soil series in this survey area. Phases, or mapping units, of each soil series are described in the section "Soil maps for detailed planning."

Ashe series

The Ashe series consists of moderately deep, somewhat excessively drained soils that formed in residuum from biotite gneiss interrupted by narrow dykes of schist. Permeability is moderately rapid. These soils are on moderately steep, convex ridgetops, and on long, steep or very steep, uneven sides of the Blue Ridge Mountains. Elevation is commonly higher than 2,500 feet. Slopes range from 10 to 75 percent but are mainly 35 to 65 percent; aspect is toward the southeast or southwest.

Ashe soils are associated with Edneyville, Porters, and Tusquitee soils. Edneyville and Porters are on the same landscape, but are deeper to hard rock and have more clay in the subsoil than Ashe soils. Tusquitee soils are in mountain coves; solum thickness is more than 40 inches. In addition, Porters and Tusquitee soils have an umbric epipedon.

Typical pedon of Ashe stony sandy loam, in an area of Ashe association, stony, very steep, in a hardwood forest on Chinquipen Ridge, 1.5 miles north of Tray Gap on west side of Corbin Creek Road, in Towns County:

O1—2 inches to 1 inch; fresh forest litter of leaves and twigs.

O2—1 inch to 0; very dark gray (10YR 3/1) decomposing forest litter mixed with some mineral matter.

A11—0 to 3 inches; very dark grayish brown (10YR 3/2) stony sandy loam; weak fine granular structure; very friable; few fine flakes of mica; 10 percent by volume coarse pebbles and stones; many fine and medium roots; strongly acid; abrupt smooth boundary.

A12—3 to 8 inches; brown (10YR 4/3) stony sandy loam; weak medium granular structure; very friable; few fine flakes of mica; 10 percent by volume coarse pebbles and stones; many fine and medium roots; strongly acid; clear smooth boundary.

B2—8 to 28 inches; strong brown (7.5YR 5/6) sandy loam; moderate medium granular structure; friable; few fine flakes of mica; 10 percent by volume coarse pebbles and stones; common fine and medium roots; strongly acid; clear wavy boundary.

C1—28 to 36 inches; yellowish brown (10YR 5/4) granite gneiss saprolite that crushes to sandy loam; massive; friable; few fine flakes of mica; 10 percent by volume coarse pebbles, cobbles, and stones; common fine and medium roots; strongly acid; clear wavy boundary.

Cr—36 inches; moderately hard, light granite gneiss.

Solum thickness ranges from 16 to 29 inches. Depth to bedrock ranges from 26 to 40 inches. Coarse pebbles, cobbles, and stones range from about 5 to 15 percent in the A and B horizons. The soil is very strongly acid or strongly acid throughout.

The A horizon is 4 to 10 inches thick. It has hue of 10YR, value of 3 to 5, and chroma of 2 to 4. A horizons that have value of less than 3.5 are less than 6 inches thick.

The B2 horizon is 11 to 20 inches thick. It has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 or 6. It is sandy loam or fine sandy loam.

The C1 horizon is 7 to 12 inches thick. It has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 or 6. Coarse fragments range from 15 to 30 percent by volume.

Bradson series

The Bradson series consists of deep, well drained, moderately permeable soils that formed in loamy and clayey sediment that was moved from higher lying soils. The Bradson soils are on toe slopes, in saddles, or in coves of the Blue Ridge Mountains. Elevation commonly ranges from 1,700 to 3,000 feet. Slopes range from 2 to 25 percent but are mainly from 10 to 25 percent; aspect is chiefly toward the south and west.

Bradson soils are on the same landscape with the Dyke and Hayesville soils. Dyke soils have a dark red subsoil. Hayesville soils are on higher lying, convex ridgetops and formed in residual material.

Typical pedon of Bradson fine sandy loam, in an area of Bradson fine sandy loam, 10 to 25 percent slopes, in a wooded area on the north side of the road 5.9 miles east of Clayton, Georgia, on U.S. Highway 76, 2.2 miles northeast on Pole Creek Road, Rabun County:

Ap—0 to 6 inches; brown (10YR 4/3) fine sandy loam; weak fine granular structure; very friable; few pebbles; few fine flakes of mica; many fine and medium roots; strongly acid; abrupt smooth boundary.

B1—6 to 10 inches; yellowish red (5YR 4/6) clay loam; weak fine subangular blocky structure; friable; few pebbles; few fine flakes of mica; many fine and medium roots; strongly acid; clear smooth boundary.

B21t—10 to 23 inches; red (2.5YR 4/8) clay loam; moderate medium subangular blocky structure; friable; few pebbles; thin patchy clay films on faces of peds; few fine flakes of mica; common fine and medium roots; strongly acid; gradual wavy boundary.

B22t—23 to 52 inches; red (2.5YR 4/8) clay; moderate medium subangular blocky structure; firm; few pebbles; continuous clay films on faces of peds; few fine flakes of mica; common fine and medium roots; strongly acid; gradual wavy boundary.

B3—52 to 67 inches; red (2.5YR 4/8) clay loam; moderate medium subangular blocky structure; friable; few pebbles; few fine flakes of mica; few fine roots; strongly acid; gradual smooth boundary.

IIC—67 to 90 inches; red (2.5YR 4/6) and strong brown (7.5YR 5/6) micaceous saprolite that is easily dug by handtools; common thin dykes of schist; common fine and medium flakes of mica; strongly acid.

Solum thickness ranges from 60 to 80 inches. Depth to bedrock ranges from 5 feet to more than 10 feet. The solum has pebbles, cobbles, and stones that range from 2 to 15 percent, and, at times, fine flakes of mica that range to 2 percent. The solum is strongly acid or very strongly acid throughout.

The A horizon is 5 to 9 inches thick. It has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4.

The B1 horizon is 3 to 5 inches thick. It has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 or 8. It is sandy clay loam or clay loam.

The Bt horizon is 40 to 45 inches thick. It has hue of 5YR to 10R, value of 4 or 5, and chroma of 6 or 8. It is clay loam or clay.

The B3 horizon is 15 to 25 inches thick. It has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 or 8. It is sandy clay loam or clay loam.

The C horizon is saprolite that crushes to sandy clay loam or clay loam.

Chatuge series

The Chatuge series consists of deep, poorly drained, moderately permeable soils that formed in loamy sediment. These soils are on low stream terraces in moderately broad valleys of the Blue Ridge Mountains. In places they are at the heads of drainageways or on toe slopes of mountains. The water table is commonly within 12 to 24 inches of the surface during winter and spring. There is the probability of very brief flooding during this period. Slopes range from 1 to 4 percent but are mainly 1 or 2 percent.

Chatuge soils are on the same landscape with the Dillard, Toxaway, and Transylvania soils. Dillard soils are on slightly higher positions in the landscape and are better drained than Chatuge soils. Toxaway and Transylvania soils have an umbric epipedon that is more than 20 inches thick, and do not have an argillic horizon. Transylvania soils are better drained than Chatuge soils.

Typical pedon of Chatuge loam, in an area of Chatuge loam, in a pasture 7.9 miles west of Hiawassee and 0.5 mile north of the town of Young Harris on U.S. Highway 76, 300 feet west of the highway and 150 feet north of Corn Creek, in Towns County:

Ap—0 to 8 inches; very dark gray (10YR 3/1) loam; moderate medium granular structure; very friable; many fine and medium roots; few fine flakes of mica; medium acid; abrupt smooth boundary.

B1g—8 to 17 inches; dark gray (10YR 4/1) clay loam; moderate medium subangular blocky structure; friable; common fine and medium roots; common fine flakes of mica; medium acid; clear smooth boundary.

B21tg—17 to 33 inches; dark gray (10YR 4/1) clay loam; common fine distinct yellowish brown mottles; moderate medium subangular blocky structure; friable; few fine roots; thin patchy clay films on faces of peds; common fine flakes of mica; medium acid; clear smooth boundary.

B22t—33 to 41 inches; dark gray (10YR 4/1) clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; moderate coarse subangular blocky structure; firm; thin patchy clay films on faces of peds; common fine flakes of mica; medium acid; clear smooth boundary.

B23tg—41 to 48 inches; dark gray (N 4/0) clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; firm; thin patchy clay films on faces of peds; common fine flakes of mica; medium acid; clear smooth boundary.

IICg—48 to 60 inches; dark gray (10YR 4/1) gravelly coarse sand; few medium distinct light yellowish brown (10YR 6/4) mottles; very friable; common fine flakes of mica; many fine pebbles; medium acid.

Solum thickness ranges from 40 to 50 inches. Depth to bedrock is 10 feet or more. The soil ranges from very strongly acid to medium acid throughout. Flakes of mica range from few to many throughout the soil.

The A horizon is commonly 6 to 8 inches thick but ranges to 10 inches thick. It has hue of 10YR, value of 3, and chroma of 1 to 3. If present, pebbles range to 5 percent by volume.

The Btg horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 0 to 2. Few or common, fine or medium yellowish brown, red, or gray mottles are throughout this horizon. If present, pebbles range to 15 percent by volume.

The IIC horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 0 to 2. It is loamy sand, gravelly coarse sand, very gravelly coarse sand, or gravelly loamy sand. Commonly, the sand and gravel are stratified. Pebbles range from 15 to 50 percent by volume.

Dillard series

The Dillard series consists of deep, moderately well drained soils that formed in loamy sediment. Permeability is moderately slow. These soils are on stream terraces in valleys or on toe slopes of the Blue Ridge Mountains. Elevation commonly ranges from 1,900 to 2,200 feet. Slopes range from 2 to 6 percent, but are mainly 2 to 4 percent; aspect is commonly towards the south and west.

Dillard soils are associated with the Bradson, Chatuge, Dyke, Toxaway, and Transylvania soils. Bradson, Chatuge, and Dyke soils are in similar positions in the landscape, but Bradson and Dyke soils are in higher lying areas, have redder subsoils than Dillard soils, and are well drained. Chatuge soils are in slightly lower areas, have dark gray subsoils, and are poorly drained. Toxaway and Transylvania soils are on lower lying flood plains and have a thick umbric epipedon. Toxaway soils are poorly drained, and Transylvania soils are well drained or moderately well drained.

Typical pedon of Dillard sandy loam, in an area of Dillard sandy loam, 2 to 6 percent slopes, in grassland 6.0 miles north of Clayton, Georgia, on U.S. Highway 441, 0.4 mile west of Rabun Gap Post Office, 50 feet north of the road at Rabun Gap School, in Rabun County:

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) sandy loam; moderate fine granular structure; very friable; many fine and medium roots; few fine flakes of mica; medium acid; abrupt wavy boundary.

B21t—8 to 20 inches; yellowish brown (10YR 5/6) sandy clay loam; thin brown (10YR 5/3) coating in root channels; moderate medium subangular blocky structure; friable; common fine and medium roots; thin patchy clay films on faces of peds; few fine flakes of mica; strongly acid; gradual wavy boundary.

B22t—20 to 27 inches; brownish yellow (10YR 6/6) sandy clay loam; common medium distinct gray (10YR 6/1) mottles; moderate medium subangular blocky structure; friable; thin patchy clay films on faces of peds; few fine and medium roots; few fine flakes of mica; strongly acid; gradual wavy boundary.

B23t—27 to 31 inches; olive yellow (2.5Y 6/6) clay loam; many coarse distinct gray (10YR 6/1) mottles; moderate medium subangular blocky structure; friable; few fine roots; thick patchy clay films on faces of peds; few fine flakes of mica; very strongly acid; gradual wavy boundary.

IIB24tg—31 to 37 inches; light gray (10YR 7/1) clay; many coarse prominent reddish yellow (5YR 6/8) and common medium distinct olive yellow (2.5Y 6/6) mottles; moderate coarse angular blocky structure; firm; thick patchy clay films on faces of peds; few fine flakes of mica; very strongly acid; clear wavy boundary.

IIB3g—37 to 55 inches; light gray (10YR 7/1) clay loam; common medium distinct light yellowish brown (2.5Y 6/4) and common fine prominent strong brown (7.5YR 5/8) mottles; weak medium angular blocky structure; firm; few fine flakes of mica; very strongly acid; gradual wavy boundary.

IIC1—55 to 62 inches; light gray (5Y 7/1) clay; common medium prominent brownish yellow (10YR 6/6) mottles; massive; very firm; few fine flakes of mica; very strongly acid.

IICr—62 to 66 inches; yellowish brown (10YR 5/6) mudstone; crushes to silty clay; difficult to cut with auger; massive; very firm; very strongly acid.

Solum thickness ranges from 30 to 60 inches. Depth to bed-rock ranges from 5 feet to more than 10 feet. The solum is strongly acid or medium acid in the A horizon and very strongly acid or strongly acid in the B and C horizons. Flakes of mica are few or common throughout.

The A horizon is 6 to 9 inches thick. It has hue of 10YR, value of 4 or 5, and chroma of 1 to 3. If present, pebbles range to 5 percent by volume.

The Bt horizon is 21 to 48 inches thick. It has hue of 2.5Y, 10YR, or 7.5YR, value of 5 or 6, and chroma of 4 to 8. It has many or common, fine to coarse gray mottles in the lower part. It is sandy clay loam or clay loam. If present, pebbles range up to 15 percent by volume.

The IIB horizon, if present, is 6 to 32 inches thick. It has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. It includes common or many, medium or coarse gray, brown, and yellow mottles. Some pedons lack a matrix color and have gray, brown, and yellow mottles. This horizon is clay or clay loam. If present, pebbles range to 5 percent by volume.

The IIC1 horizon is 5 to 20 inches thick. It has hue of 5Y or 10YR, value of 5 to 7, and chroma of 1 or 2. It includes common or many brown and yellow mottles.

This horizon is clay, silty clay, or sandy loam. If present, pebbles range to 35 percent by volume.

The IICr horizon, if present, is 6 to 10 inches or more thick. It is mudstone that crushes to a silty clay loam or silty clay.

Dyke series

The Dyke series consists of deep, well drained, moderately permeable soils that formed in loamy and clayey sediment that was moved from higher lying soils. The Dyke soils are on high stream terraces and on colluvial fans in valleys of the Blue Ridge Mountains. In places they are on toe slopes, in coves, or in saddles of the mountains. Elevation commonly ranges from 1,800 to 2,500 feet. Slopes range from 2 to 25 percent but are mainly 2 to 15 percent.

Dyke soils are associated with the Bradson, Hayesville, and Rabun soils. Bradson and Hayesville soils are on the same landscape, but they are not as red as the Dyke soils. Also, the Hayesville soils formed in residual material. Rabun soils also formed in residual material and are on the higher lying ridgetops and sides of mountains. In addition, Rabun soils have a thinner solum than Dyke soils that formed in residual material.

Typical pedon of Dyke loam, in an area of Dyke loam, 2 to 10 percent slopes, in an idle field south of U.S. Highway 76, 5.0 miles east of Hiawassee, 210 feet northeast of Lower Hightower Church, in Towns County:

Ap—0 to 8 inches; dark reddish brown (5YR 3/4) loam; weak fine granular structure; very friable; few fine flakes of mica; many fine and medium roots; strongly acid; abrupt smooth boundary.

B1—8 to 12 inches; dark red (2.5YR 3/6) clay loam; weak medium subangular blocky structure; friable; few fine flakes of mica; many fine and medium roots; strongly acid; clear wavy boundary.

B21t—12 to 21 inches; dark red (2.5YR 3/6) clay; moderate medium subangular blocky structure; friable; thin discontinuous clay films on faces of peds; few fine flakes of mica; common fine and medium roots; strongly acid; gradual wavy boundary.

B22t—21 to 72 inches; dark red (10YR 3/6) clay; moderate medium subangular blocky structure; firm; thin continuous clay films on faces of peds; few fine flakes of mica; about 5 percent pebbles by volume; few fine roots; strongly acid.

Solum thickness ranges from 48 to 72 inches or more. Depth to hard rock ranges from 8 to 12 feet or more. Coarse rounded quartz pebbles range to 10 percent throughout the soil. The soil is strongly acid or medium acid.

The A horizon is 6 to 9 inches thick. It has hue of 5YR or 2.5YR, value of 2 or 3, and chroma of 2 or 4.

The B1 horizon is 0 to 4 inches thick. It has hue of 2.5YR or 5YR, value of 3, and chroma of 4 or 6. It is clay loam or loam.

The Bt horizon is 40 to 60 inches or more thick. It has hue of 2.5YR or 10R, value of 3, and chroma of 4 or 6. It is silty clay loam or clay.

Edneyville series

The Edneyville series consists of deep, well drained, moderately permeable soils that formed in residuum from granite and gneiss interrupted by narrow dykes of schist. These soils are on narrow ridgetops and on steep, uneven sides of the Blue Ridge Mountains. Elevation commonly ranges from 2,500 to 4,500 feet or more. Slopes range from 10 to 45 percent but are mainly 25 to 45 percent; aspect is toward the southeast to southwest.

Edneyville soils are associated with the Ashe, Porters, Evard, and Tusquitee soils. Ashe, Porters, and Evard soils are on the same landscape, but Ashe soils are more shallow to hard rock and do not have an argillic horizon. Porters soils have an umbric epipedon, and Evard soils have a redder subsoil than Edneyville soils and are on midmountain slopes. Tusquitee soils are in concave mountain coves and on saddles. They are on the foot slopes of mountains.

Typical pedon of Edneyville sandy loam, in an area of Edneyville sandy loam, 10 to 25 percent, in a hardwood forest 0.8 mile north of Indian Grave Gap on the east side of a logging road, in Towns County:

O1—2 inches to 1 inch; fresh forest litter of leaves and twigs.

O2—1 inch to 0; dark grayish brown (10YR 4/2) decomposing forest litter mixed with some mineral matter.

A1—0 to 5 inches; dark brown (10YR 4/3) sandy loam; weak medium granular structure; very friable; few fine flakes of mica; 5 percent by volume pebbles and cobbles; many fine and medium roots; strongly acid; clear smooth boundary.

A2—5 to 11 inches; brown (7.5YR 5/4) sandy loam; weak medium granular structure; very friable; few fine flakes of mica; 5 percent by volume pebbles and cobbles; many fine and medium roots; strongly acid; clear wavy boundary.

B1—11 to 15 inches; brown (7.5YR 5/4) sandy loam; weak fine subangular blocky structure; friable; common fine flakes of mica; 5 percent by volume pebbles and cobbles; common fine and medium roots; strongly acid; clear wavy boundary.

B2t—15 to 30 inches; strong brown (7.5YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; common fine flakes of mica; 10 percent by volume pebbles and cobbles; few fine and medium roots; strongly acid; clear wavy boundary.

B3—30 to 37 inches; yellowish brown (10YR 5/6) fine sandy loam; weak fine subangular blocky structure;

very friable; common fine flakes of mica; 10 percent by volume pebbles and cobbles; few fine roots; strongly acid; clear wavy boundary.

C1—37 to 48 inches; yellowish brown (10YR 5/6) granite gneiss saprolite; easily crushes to sandy loam; massive; common fine flakes of mica; 15 percent by volume pebbles and stones; clear wavy boundary.

Cr—48 inches; weathered multicolored granite gneiss.

Solum thickness ranges from 25 to 37 inches. Depth to weathered rock ranges from 48 to 60 inches or more. Few or common fine flakes of mica are throughout the soil. The soil is strongly acid or very strongly acid throughout. Pebbles, cobbles, and stones range from 2 to 25 percent.

The A1 horizon is 1 to 5 inches thick. It has hue of 10YR or 7.5YR, value of 3 or 4, and chroma of 2 to 4. The A2 horizon is 2 to 6 inches thick. It has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 or 4. Pebbles and cobbles range from 2 to 25 percent by volume.

The Bt horizon is 12 to 18 inches thick. It has hue of 7.5YR or 10YR, value of 5, and chroma of 3, 4, or 6. It is sandy clay loam or loam. Pebbles and cobbles range from 3 to 15 percent by volume.

The C1 horizon is saprolite that has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 6.

Evard series

The Evard series consists of deep, well drained, moderately permeable soils that formed in residuum from granite gneiss interrupted by narrow dykes of schist. These soils are on narrow ridge tops and on uneven, complex sides of the Blue Ridge Mountains midway on the mountains. Elevation ranges from 1,500 to 2,800 feet. Slopes range from 25 to 50 percent; aspect is toward the south.

Evard soils are associated with the Ashe, Edneyville, Fannin, Hayesville, Porters, Saluda, and Tusquitee soils. Commonly, the Ashe, Edneyville, Porters, and Saluda soils are on higher lying ridgetops and mountainsides. These soils, with the exception of the shallow Saluda soils, do not have reddish subsoils. Fannin and Hayesville soils are on lower lying intermountain plateaus. Fannin soils have a high mica content, and Hayesville soils have a thicker solum and a higher clay content in the subsoil than Evard soils. Tusquitee soils are in coves and on foot slopes of mountains.

Typical pedon of Evard sandy loam, in an area of Evard association, steep, in a mixed hardwood and pine forest 1.5 miles southwest of Indian Grave Gap Road at a sharp turn to the west, east of the road, in Towns County:

O2—1 inch to 0; very dark grayish brown (10YR 3/2) decomposing forest litter mixed with some mineral matter.

A1—0 to 2 inches; dark brown (10YR 3/3) sandy loam; weak medium granular structure; very friable; few fine flakes of mica; 15 percent quartz pebbles and cobbles by volume; many fine and medium roots; strongly acid; abrupt smooth boundary.

A3—2 to 5 inches; reddish brown (5YR 4/3) sandy loam; weak medium granular structure; very friable; few fine flakes of mica; 10 percent quartz pebbles and cobbles by volume; many fine and medium roots; strongly acid; clear wavy boundary.

B21t—5 to 12 inches; yellowish red (5YR 5/6) sandy clay loam; weak fine subangular blocky structure; friable; thin discontinuous clay films on faces of peds; common fine flakes of mica; 10 percent quartz pebbles and cobbles by volume; common fine and medium roots; strongly acid; clear wavy boundary.

B22t—12 to 28 inches; yellowish red (5YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable; thin discontinuous clay films on faces of peds; few fine flakes of mica; 10 percent quartz pebbles and cobbles by volume; common fine and medium roots; strongly acid; clear wavy boundary.

B3—28 to 34 inches; yellowish red (5YR 4/8) sandy clay loam; weak fine subangular blocky structure; friable; common fine flakes of mica; 10 percent quartz pebbles and cobbles by volume; common fine and medium roots; strongly acid; clear wavy boundary.

C1—34 to 50 inches; yellowish red (5YR 4/8), red (2.5YR 5/8), and yellowish brown (10YR 5/6) saprolite; crushes to sandy loam; massive; friable; common fine flakes of mica; few fine and medium roots; strongly acid; gradual wavy boundary.

Cr—50 inches; moderately hard weathered granite gneiss.

Solum thickness ranges from 27 to 37 inches. Depth to moderately hard weathered rock is 4 feet or more, and depth to hard rock is 5 feet or more. Volume of pebbles and cobbles ranges from 5 to 15 percent in the A horizon and from 5 to 10 percent in the B horizon. Fine flakes of mica are few or common throughout.

The A1 horizon is 2 to 6 inches thick. It has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4. The A3 horizon, if present, is 2 to 5 inches thick. It has hue of 5YR, value of 4, and chroma of 4 or 6.

The Bt horizon is 15 to 25 inches thick. It has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 or 8. It is sandy clay loam or clay loam.

The B3 horizon is 6 to 12 inches thick. It has the same color range as the Bt horizon. It is sandy clay loam or sandy loam.

The C horizon is weathered gneiss and schist and has light and dark weathered fragments.

Fannin series

The Fannin series consists of moderately deep, well drained, moderately permeable soils that formed in residuum from mica schist and mica gneiss. These soils are on intermountain plateaus of the Blue Ridge Mountains. Elevation ranges between 2,000 and 2,600 feet. Slopes range from 2 to 25 percent but are mainly 10 to 25 percent; aspect is chiefly toward the south and west.

Fannin soils are associated with the Evard, Hayesville, and Saluda soils. Fannin soils are more micaceous throughout than the associated soils. Evard soils and Saluda soils are on higher lying adjacent mountains, and Saluda soils have a solum less than 20 inches thick. Hayesville soils are on the same landscape, have more clay in the subsoil than Fannin soils, and have a solum more than 40 inches thick.

Typical pedon of Fannin fine sandy loam, in an area of Fannin fine sandy loam, 10 to 25 percent slopes, in a wooded area 3.4 miles north of Hiawassee on Georgia Highway 75, 0.1 mile northeast on county gravel road, northwest of the road, in Towns County:

O1—2 inches to 1 inch; fresh forest litter of leaves and twigs.

O2—1 inch to 0; very dark grayish brown (10YR 3/2) decomposing forest litter mixed with some mineral matter.

A1—0 to 4 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; very friable; few flat fragments of schist; common fine flakes of mica; many fine and medium roots; strongly acid; clear smooth boundary.

A2—4 to 9 inches; brown (7.5YR 5/4) fine sandy loam; moderate medium granular structure; very friable; few flat fragments of schist; common fine flakes of mica; many fine and medium roots; strongly acid; clear smooth boundary.

B1—9 to 15 inches; yellowish red (5YR 5/6) clay loam; weak fine subangular blocky structure; friable; few flat fragments of schist; common fine flakes of mica; many fine and medium roots; strongly acid; clear smooth boundary.

B2t—15 to 28 inches; red (2.5YR 4/8) clay loam; moderate medium subangular blocky structure; friable; thin discontinuous clay films on faces of peds; many fine and medium flakes of mica have greasy feel; about 10 percent by volume flat fragments of schist; common fine and medium roots; strongly acid; gradual wavy boundary.

B3—28 to 35 inches; red (2.5YR 4/8) loam; weak medium subangular blocky structure; friable; many fine and medium flakes of mica; 15 percent by volume flat fragments of schist; few fine roots; strongly acid; gradual irregular boundary.

C—35 to 72 inches; weathered mica schist saprolite with red (2.5YR 4/8), yellowish red (5YR 4/8), and strong brown (7.5YR 5/8) loam in cracks and seams; saprolite crushes to loam; massive; many fine and medium flakes of mica have greasy feel; about 20 percent by volume flat fragments of schist; few fine roots in the upper part; strongly acid.

Solum thickness ranges from 27 to 35 inches. Depth to weathered rock is 20 to 40 inches. Pebbles and flat schist fragments range from 2 to 15 percent throughout. Flakes of mica are common or many throughout.

The A1 horizon is 2 to 5 inches thick. It has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 4. The A2 horizon is 3 to 6 inches thick. It has hue of 7.5YR or 10YR, value of 5, and chroma of 3 or 4.

The B horizon is 8 to 30 inches thick. It has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 or 8. It is clay loam or loam.

The C horizon is yellowish red, light reddish brown, or pale brown weathered micaceous saprolite that crushes to loam or fine sandy loam.

Hayesville series

The Hayesville series consists of deep, well drained, moderately permeable soils that formed in residum from granite, gneiss, and schist. These soils are on intermountain plateaus of the Blue Ridge Mountains. Elevation commonly ranges from 1,800 to 3,400 feet. Slopes range from 2 to 25 percent but are mainly 10 to 25 percent; aspect chiefly is toward the south and west.

Hayesville soils are associated with the Bradson, Dyke, and Evard soils. Bradson and Dyke soils are on toe slopes, on saddles, or in coves of mountains, and formed in loamy and clayey sediment. Evard soils are on higher lying steep mountainsides, have a thinner solum, and have less clay in the subsoil than Hayesville soils.

Typical pedon of Hayesville fine sandy loam, in an area of Hayesville fine sandy loam, 10 to 25 percent slopes, in a wooded area 3.4 miles south of Clayton on U.S. Highway 441, 0.3 mile west on the south side of the county paved road, Rabun County:

A1—0 to 2 inches; dark brown (10YR 3/3) fine sandy loam; weak fine granular structure; very friable; few medium pebbles; many fine and medium roots; strongly acid; clear smooth boundary.

A2—2 to 8 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine granular structure; very friable; few medium pebbles; many fine and medium roots; few fine flakes of mica; strongly acid; clear smooth boundary.

B1—8 to 13 inches; yellowish red (5YR 5/8) sandy clay loam; weak fine subangular blocky structure; friable; common fine and medium roots; few fine flakes of mica; strongly acid; clear smooth boundary.

B21t—13 to 33 inches; red (2.5YR 5/6) clay loam; moderate medium subangular blocky structure; friable;

thin patchy clay films on faces of peds; common fine and medium roots; common fine flakes of mica; strongly acid; gradual wavy boundary.

B22t—33 to 47 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; firm; thin patchy clay films on faces of peds; common fine flakes of mica; few fine roots; strongly acid; gradual wavy boundary.

B3—47 to 55 inches; red (2.5YR 5/8) clay loam; weak medium subangular blocky structure; friable; few medium pebbles; common fine and medium flakes of mica; strongly acid; gradual irregular boundary.

C—55 to 72 inches; red, yellowish brown, and gray saprolite that is easily dug by handtools; massive; friable; common fine and medium flakes of mica; strongly acid.

Solum thickness ranges from 46 to 56 inches. If present, pebbles and cobbles range to 10 percent by volume throughout. If present, flakes of mica range to 2 percent in the A horizon and to 20 percent in the B horizon.

The A1 horizon is 1 to 3 inches thick. It has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4. The A2 horizon is 3 to 6 inches thick. It has hue of 7.5YR or 10YR, value of 5, and chroma of 3, 4, or 6.

The B1 horizon is 3 to 5 inches thick. It has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 or 8. It is sandy clay loam or clay loam.

The Bt horizon is 24 to 34 inches thick. It has hue of 2.5YR or 10R, value of 4 or 5, and chroma of 6 or 8. It is clay loam or clay.

The B3 horizon is 6 to 12 inches thick. It has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 or 8. It is sandy clay loam or clay loam.

The C horizon includes red and light gray saprolite that crushes to fine sandy loam or sandy clay loam.

Haywood series

The Haywood series consists of deep, well drained, rapidly permeable soils that formed in loamy sediment moved from higher lying soils. These soils are in steep coves and saddles, or on foot slopes of the Blue Ridge Mountains. Elevation commonly ranges from 2,600 to 4,200 feet. Slopes range from 15 to 45 percent but are mostly 25 to 45 percent.

Haywood soils are associated with the Ashe, Edneyville, Porters, and Tusquitee soils. Ashe, Edneyville, and Porters soils are on higher lying mountain landscapes. Ashe and Edneyville soils have an ochric epipedon and a thinner solum, and and Edneyville soils have more clay in the subsoil. Porters soils have a thinner A horizon and a thinner solum. Haywood and Tusquitee soils are in similar boundaries in the landscape, but Tusquitee soils are commonly in lower lying coves, saddles, and foot slopes, and have a humic surface layer and more clay in the B horizons.

Typical pedon of Haywood stony loam in an area of Tusquitee-Haywood association, steep, at the headwaters of Mossy Cove Branch north of Corbin Creek Road, in Towns County:

O2—1 inch to 0; black (10YR 2/1) organic matter in different stages of decomposition.

A11—0 to 16 inches; black (10YR 2/1) stony loam; weak moderate granular structure; very friable; 20 percent cobbles and stones by volume; many fine roots; few fine flakes of mica; medium acid; clear wavy boundary.

A12—16 to 24 inches; very dark grayish brown (10YR 3/2) stony loam; weak medium granular structure; very friable; 25 percent cobbles and stones by volume; many fine and medium roots; few fine flakes of mica; medium acid; clear wavy boundary.

A13—24 to 36 inches; dark brown (10YR 3/3) stony fine sandy loam; weak medium granular structure; very friable; 25 percent cobbles and stones by volume; many fine and medium roots; few fine flakes of mica; medium acid; clear wavy boundary.

B21—36 to 50 inches; brown (10YR 4/3) stony fine sandy loam; weak medium granular structure; very friable; 25 percent cobbles and stones by volume; few fine and medium roots; few fine flakes of mica; medium acid.

B22—50 to 66 inches; dark yellowish brown (10YR 4/4) stony fine sandy loam; weak fine subangular blocky structure; friable; 25 percent cobbles and stones by volume; few fine flakes of mica; few medium roots; medium acid.

Solum thickness is 60 inches or more. Hard rock is commonly at a depth of 6 feet or more. The fine earth fraction of the A and B horizons is loam or fine sandy loam. Stones, cobbles, and boulders range from 15 to 30 percent throughout but mostly range from 20 to 25 percent. The soil ranges from strongly acid to slightly acid throughout.

The A horizon is 24 to 40 inches thick. It has hue of 10YR, value of 2 or 3, and chroma of 1 to 3.

The B horizon is 36 inches or more in thickness. It has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3, 4, or 6. It is stony fine sandy loam or stony loam.

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

Lily series

The Lily series consists of moderately deep, well drained soils that formed in residuum from sandstone and quartzite. Permeability is moderately rapid. These soils are on ridgetops and sides of the Blue Ridge Mountains. Elevation commonly ranges from 1,500 to 2,000 feet. Slopes range from 10 to 50 percent; aspect is chiefly toward the south.

Lily soils are associated with the Evard, Hayesville, Ramsey, and Saluda soils. Evard, Ramsey, and Saluda soils are in similar positions in the landscape, but Hayesville soils are on intermountain plateaus. Evard soils have a redder subsoil; Hayesville soils have a thicker solum and a red clayey subsoil; Ramsey soils have less clay, more coarse fragments in the subsoil, and a solum less than 20 inches thick; and Saluda soils commonly have redder subsoils and a solum less than 20 inches thick.

Typical pedon of Lily fine sandy loam, in an area of Lily fine sandy loam, 10 to 25 percent slopes, in a wooded area 10.8 miles south of Clayton on U.S. Highway 441, 675 feet east of the highway, in Rabun County:

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; few coarse sand grains; about 5 percent by volume pebbles; very strongly acid; clear smooth boundary.

B21t—5 to 11 inches; yellowish brown (10YR 5/4) sandy clay loam; weak medium subangular blocky structure; friable; common fine and medium roots; thin patchy clay films on faces of peds; about 5 percent by volume pebbles; very strongly acid; gradual wavy boundary.

B22t—11 to 28 inches; strong brown (7.5YR 5/8) sandy clay loam; moderate medium subangular blocky structure; friable; few fine and medium roots; thin patchy clay films on faces of peds; few coarse sand grains; about 5 percent by volume pebbles; very strongly acid; gradual wavy boundary.

C1—28 to 39 inches; strong brown (7.5YR 5/8) loamy sand; single-grained; very friable; few fine roots; about 10 percent by volume fine pebbles; very strongly acid; gradual irregular boundary.

R—39 inches; hard sandstone; very difficult to cut with hand tools.

Solum thickness ranges from 23 to 38 inches. Depth to bedrock ranges from 23 to 40 inches. Pebbles and cobbles range from 2 to 10 percent. If present, fine flakes of mica range to 2 percent.

The Ap horizon is 3 to 5 inches thick. It has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 2. The A2 horizon, if present, is 3 to 5 inches thick. It has hue of 10YR, value of 5 or 6, and chroma of 2 to 4.

The B1 horizon, if present, is 3 to 5 inches thick. It has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6. It is fine sandy loam or sandy loam.

The Bt horizon is 20 to 28 inches thick. It has hue of 10YR or 7.5YR, value of 5, and chroma of 6 or 8.

The C1 horizon is 2 to 12 inches thick. It has hue of 10YR to 2.5YR, value of 5 or 6, and chroma of 4, 6, or 8. It is loamy sand or sandy loam.

Porters series

The Porters series consists of moderately deep, well drained, soils that formed in residuum mainly from biotite gneiss interrupted by dykes of schist. Permeability is moderately rapid. Porters soils commonly are on moderately steep, somewhat smooth ridgetops and steep or very steep sides of the Blue Ridge Mountains. Elevation commonly ranges from 2,500 to more than 4,500 feet. Slopes range from 10 to 65 percent but are mainly 15 to 65 percent; aspect is toward the north.

Porters soils are associated with Ashe, Edneyville, Haywood, and Tusquitee soils. Ashe and Edneyville soils are in similar positions in the landscape. Ashe soils have a south exposure, are more shallow to hard rock than Porters soils, and do not have an argillic horizon. Edneyville soils have value of more than 3.5 in surface layers. Haywood and Tusquitee soils are in mountain coves; Haywood soils have a thick umbric epipedon, and Tusquitee soils have solum thickness more than 40 inches.

Typical pedon of Porters stony loam, in an area of Porters association, stony, steep, in a hardwood forest on Tray Mountain Road, 2.0 miles northeast of Indian Grave Gap, in Towns County:

O1—2 inches to 1 inch; fresh forest litter of leaves and twigs.

O2—1 inch to 0; black (10YR 2/1) decomposing forest litter mixed with a small amount of mineral matter; many fine roots and mycelium.

A11—0 to 4 inches; very dark brown (10YR 2/2) stony loam; weak and moderate medium granular structure; very friable; about 20 percent cobbles and stones by volume; few fine flakes of mica; many fine and medium roots; strongly acid; clear smooth boundary.

A12—4 to 7 inches; very dark grayish brown (10YR 3/2) stony loam; weak and moderate medium granular structure; very friable; about 20 percent cobbles and stones by volume; few fine flakes of mica; many fine and medium roots; medium acid; clear smooth boundary.

B1—7 to 10 inches; brown (10YR 4/3) sandy loam; weak fine subangular blocky structure; friable; about 10 percent cobbles and stones by volume; few fine flakes of mica; common fine and medium roots; medium acid; clear wavy boundary.

B2t—10 to 20 inches; brown (7.5YR 4/4) sandy clay loam; weak medium subangular blocky structure; few patchy clay films on faces of peds; about 15 percent cobbles and stones by volume; few fine flakes of mica; common fine and medium roots; medium acid; clear wavy boundary.

B3—20 to 25 inches; brown (7.5YR 4/4) sandy loam; weak fine subangular blocky structure; very friable; about 15 percent cobbles and stones by volume;

few fine flakes of mica; common fine and medium roots; medium acid; clear wavy boundary.

C—25 to 40 inches; strong brown (7.5YR 5/6), brown (10YR 5/3), and dark yellowish brown (10YR 4/4) saprolite; crushes to sandy loam; massive; very friable; many fine and medium flakes of mica; common minerals such as feldspar and hornblende; medium acid; changes with depth to hard rock.

R—40 inches; dark gneissic rock.

Solum thickness ranges from 25 to 38 inches. Depth to hard rock ranges from about 40 to 72 inches. The soil is strongly acid or medium acid throughout. Stones and cobbles make up from 10 to 25 percent of the solum.

The A horizon is 7 to 10 inches thick. It has hue of 10YR or 7.5YR, value of 2 or 3, and chroma of 1 to 3.

The B1 horizon is 2 to 4 inches thick. It has hue of 7.5YR or 10YR, value of 4, and chroma of 3 or 4. It is sandy loam or loam.

The Bt horizon is 10 to 14 inches thick. It has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2, 3, 4, or 6. It is sandy clay loam, loam, or clay loam.

The B3 horizon is 3 to 6 inches thick. It has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 or 6. It is sandy loam or loam.

The C horizon is commonly residuum weathered from gneiss. It has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2, 3, 4, or 6. Cobbles and stones range from 20 to 30 percent by volume.

Rabun series

The Rabun series consists of deep, well drained soils that formed in residuum from rock that had a high content of ferromagnesian minerals. Permeability is moderate. These soils are on ridgetops and on sides of the Blue Ridge Mountains. Elevation commonly ranges from 2,200 to 3,200 feet. Slopes range from 10 to 50 percent but are mainly 15 to 30 percent; aspect chiefly is toward the northwest and east.

Rabun soils are associated with the Dyke, Evard, and Hayesville soils. Dyke soils commonly are on high stream terraces and colluvial fans in the valleys and have a mixed minerology. Evard soils are in similar positions in the landscape, but the subsoil is not so red as Rabun soils. Hayesville soils are on intermountain plateaus and the subsoil is also less red than Rabun soils.

Typical pedon of Rabun loam, in an area of Rabun loam, 10 to 25 percent slopes, in a wooded area 0.6 miles north of the town of Young Harris on U.S. Highway 76, 1.2 miles generally east on a dirt road, 10 feet east of the roadbank, in Towns County:

O2—1 inch to 0; dark reddish brown (5YR 3/2) decomposing forest litter mixed with a small amount of mineral matter; few fine roots; medium acid.

A11—0 to 2 inches; dark reddish brown (5YR 3/3) loam; weak fine granular structure; very friable; few pebbles; many fine and medium roots; medium acid; clear smooth boundary.

A12—2 to 9 inches; dark reddish brown (5YR 3/4) loam; moderate medium granular structure; very friable; few pebbles; many fine and medium roots; medium acid; clear smooth boundary.

B1—9 to 14 inches; dark red (2.5YR 3/6) clay; weak fine subangular blocky structure; friable; common fine and medium roots; medium acid; clear smooth boundary.

B2t—14 to 37 inches; dark red (2.5YR 3/6) clay; moderate medium subangular blocky structure; firm; thin continuous clay films on faces of peds; common strong brown (7.5YR 5/6) medium and coarse fragments of saprolite; common fine and medium roots; medium acid; gradual wavy boundary.

B3—37 to 48 inches; dark red (2.5YR 3/6) clay; weak medium subangular blocky structure; friable; common strong brown (7.5YR 5/6) medium and coarse fragments of saprolite; few fine and medium roots; medium acid; gradual wavy boundary.

C—48 to 62 inches; strong brown (7.5YR 5/6) and yellowish red (5YR 5/6) saprolite material; loose soft rock fragments about 2 to 10 millimeters in size; dark red (2.5YR 3/6), red (2.5YR 4/6), and strong brown (7.5YR 5/6) loam material in pockets and between rock fragments; massive; common angular hard pebbles and cobbles; medium acid.

Solum thickness ranges from 34 to 56 inches. Depth to hard rock ranges from 5 feet to 10 feet or more. The soil ranges from strongly acid to slightly acid throughout.

The A horizon is 6 to 12 inches thick. It has hue of 5YR to 10R, value of 3, and chroma of 2 to 4. Pebbles, stones, and cobbles range from 2 to 35 percent.

The Bt horizon is 18 to 36 inches thick. It has hue of 2.5YR or 10R, value of 3, and chroma of 6. It is clay loam or clay. If present, pebbles and cobbles range up to 15 percent.

The B3 horizon is 5 to 15 inches thick. It has hue of 2.5YR or 10R, value of 3 or 4, and chroma of 6 or 8. It is loam, clay loam, stony clay loam, or cobbly clay loam and has red and strong brown few or common mottles. Cobbles and stones range from 10 to 25 percent, many are fragments of saprolite.

The C horizon has hue of 7.5YR to 2.5YR, value of 4 or 5, and chroma of 6 or 8. Cracks and pockets are filled with clay loam or loam having hue of 2.5YR or 10R, value of 3 or 4, and chroma of 6 or 8. Pebbles, cobbles, and stones range from few to many.

Ramsey series

The Ramsey series consists of shallow, somewhat excessively drained soils that formed in residuum from sandstone and quartzite. Permeability is rapid. These soils are on sides of the Blue Ridge Mountains. Elevation commonly ranges from 1,500 and 2,000 feet. Slopes range from 25 to 60 percent but are mainly 25 to 50 percent; aspect chiefly is toward the south and west.

Ramsey soils are in similar positions in the landscape with Evard, Lily, and Saluda soils. Evard soils are deeper and have redder subsoils of a higher clay content than Ramsey soils. Lily soils are also deeper and have subsoils of a higher clay content. Saluda soils have subsoils of a higher clay content than Ramsey soils.

Typical pedon of Ramsey stony sandy loam, in an area of Ramsey-Lily association, stony, steep, in a wooded area 11.2 miles south of Clayton on U.S. Highway 441, 1.7 miles on the southeast road, and 200 feet north of the road, in Rabun County:

O1—1 inch to 1/2 inch; forest litter of leaves and twigs.

O2—1/2 inch to 0; very dark grayish brown (10YR 3/2) decomposing forest litter mixed with some mineral matter.

A1—0 to 1 inch; dark brown (10YR 3/3) stony sandy loam; weak fine and medium granular structure; very friable; about 15 percent by volume sandstone pebbles, cobbles, and stones; many fine and medium roots; strongly acid; clear smooth boundary.

A2—1 to 5 inches; brown (10YR 4/3) stony sandy loam; weak medium granular structure; very friable; about 15 percent by volume sandstone pebbles, cobbles, and stones; many fine and medium roots; strongly acid; clear smooth boundary.

B2—5 to 11 inches; yellowish brown (10YR 5/4) stony sandy loam; weak fine subangular blocky structure; friable; about 15 percent by volume sandstone pebbles, cobbles, and stones; common fine and medium roots; strongly acid; clear smooth boundary.

B3—11 to 14 inches; yellowish brown (10YR 5/6) stony sandy loam; weak fine and medium subangular blocky structure; friable; about 20 percent by volume sandstone pebbles, cobbles, and stones; few fine and medium roots; strongly acid; clear smooth boundary.

Cr—14 to 17 inches; strong brown (7.5YR 5/6) and yellowish brown (10YR 5/6) soft sandstone; crushes to stony loamy sand; massive; about 30 percent by volume hard sandstone cobbles and stones; few fine roots in seams; strongly acid.

R—17 inches; moderately hard sandstone.

Solum thickness and depth to bedrock range from 10 to 20 inches. The soil is strongly acid or very strongly acid throughout. Volume of pebbles, stones, and cobbles ranges from about 5 to 25 percent.

The A1 horizon is 1 or 2 inches thick. It has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. The A2 horizon is 3 to 5 inches thick. It has hue of 10YR, value of 4 or 5, and chroma of 3 or 4.

The B horizon is 4 to 12 inches thick. It has hue of 10YR or 7.5YR, value of 5, and chroma of 4 or 6.

Saluda series

The Saluda series consists of shallow, well drained soils that formed in residuum from granite, gneiss, and schist. Permeability is moderate. These soils are on ridgetops and on sides of the Blue Ridge Mountains. Elevation commonly ranges from 1,800 to 3,300 feet. Slopes range from 10 to 90 percent but are mainly 25 to 50 percent, and aspect commonly is toward the south and east.

Saluda soils are associated with the Ashe, Edneyville, Evard, Fannin, and Lily soils. Fannin soils are on lower lying and smoother landscapes than Saluda soils. Ashe soils have a cambic horizon and a solum of more than 20 inches in thickness. Edneyville, Evard, Fannin, and Lily soils have a solum of more than 20 inches in thickness. In addition, Fannin soils are micaceous, and Lily soils formed in weathered sandstone and quartzite.

Typical pedon of Saluda fine sandy loam, in an area of Saluda association, steep, in a wooded area 13.7 miles west of Clayton on U.S. Highway 76, north of the road in Turkey Gap, in Rabun County:

O1—2 inches to 1 inch; forest litter of leaves and twigs.

O2—1 inch to 0; very dark grayish brown (10YR 3/2) decomposing forest litter mixed with some mineral matter.

A1—0 to 2 inches; brown (10YR 4/3) fine sandy loam; weak medium granular structure; very friable; about 5 percent pebbles and stones by volume; few fine flakes of mica; many fine and medium roots; strongly acid; abrupt smooth boundary.

A2—2 to 5 inches; brown (7.5YR 4/4) fine sandy loam; weak medium granular structure; very friable; about 5 percent pebbles and stones by volume; few fine flakes of mica; many fine and medium roots; strongly acid; clear smooth boundary.

B2t—5 to 16 inches; yellowish red (5YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable; thin patchy clay films on faces of peds; about 10 percent pebbles and stones by volume; few fine flakes of mica; many fine and medium roots; strongly acid; gradual wavy boundary.

C1—16 to 34 inches; yellowish red (5YR 5/6), strong brown (7.5YR 5/6) and yellowish brown (10YR 5/6) saprolite; easily cut by handtools; crushes to sandy loam; massive; friable; thin dykes of schist; few fine flakes of mica; about 20 percent pebbles and stones by volume; common fine and medium roots; strongly acid; gradual irregular boundary.

C2—34 to 60 inches; strong brown (7.5YR 5/6), brownish yellow (10YR 6/6), and grayish brown (10YR 5/2) saprolite; easily cut by handtools; massive; crushes to loamy sand; friable; thin dykes of schist;

few fine flakes of mica; about 30 percent pebbles and stones by volume; few fine and medium roots; strongly acid.

Solum thickness ranges from 14 to 19 inches. Depth to hard rock is 5 feet or more. Pebbles, stones, and cobbles make up from 5 to 15 percent of the solum. The soil is strongly acid or very strongly acid throughout.

The A1 horizon is 2 to 5 inches thick. It has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. The A2 horizon is 2 to 5 inches thick. It has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3, 4, or 6.

The Bt horizon is 10 to 12 inches thick. It has hue of 5YR or 7.5YR, value of 5 or 6, and chroma of 4, 6, or 8. It is sandy clay loam or clay loam.

The C horizon is highly weathered granite, gneiss, or schist. It crushes to sandy loam or loamy sand.

Toccoa series

The Toccoa series consists of deep, well drained soils that formed in recent loamy alluvial sediment. Permeability is moderately rapid. These nearly level soils are on flood plains adjacent to the larger streams in valleys of the Blue Ridge Mountains. The water table is between 30 to 60 inches from the surface late in winter and early in spring. Also, there is a high probability of frequent flooding during this period. Slopes range from 0 to 3 percent.

Toccoa soils are in similar positions in the landscape as Chatuge, Toxaway, and Transylvania soils. Chatuge soils have a Bt horizon and are poorly drained. Toxaway soils have a cumulic surface layer and are poorly drained. Transylvania soils have a cumulic surface layer and are well drained or moderately well drained.

Typical pedon of Toccoa fine sandy loam, in an area of Toccoa fine sandy loam, in a pasture 5.3 miles south of Hiawassee on Georgia Highway 75, 900 feet west of the highway, Towns County:

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

C1—8 to 18 inches; dark yellowish brown (10YR 4/4) sandy loam; massive; very friable; common fine flakes of mica; thin loamy sand bedding planes; many fine roots; medium acid; gradual smooth boundary.

C2—18 to 30 inches; dark yellowish brown (10YR 4/4) sandy loam; massive; very friable; common fine flakes of mica; thin light yellowish brown (10YR 6/4) loamy sand bedding planes; few fine roots; medium acid; gradual smooth boundary.

C3—30 to 37 inches; dark grayish brown (10YR 4/2) sandy loam; massive; very friable; common fine flakes of mica; thin strong brown (7.5YR 5/6), dark yellowish brown (10YR 4/4), and light yellowish brown (10YR 6/4) loam, sandy loam, and loamy sand bedding planes; few fine roots; medium acid; gradual smooth boundary.

C4—37 to 46 inches; dark grayish brown (10YR 4/2) sandy loam; common medium prominent yellowish red (5YR 4/6) mottles; massive; very friable; common fine flakes of mica; few fine roots; medium acid; gradual smooth boundary.

C5—46 to 62 inches; stratified gray (10YR 5/1) and brown (10YR 5/3) loamy sand; single grain; loose; common fine flakes of mica; medium acid.

Alluvium ranges from 5 to 10 feet or more in thickness. It ranges from strongly acid to slightly acid throughout. Common or many, fine and medium flakes of mica are throughout.

The A horizon is 8 to 12 inches thick. It has hue of 10YR or 7.5YR, value of 3 or 4, and chroma of 2 to 4.

The C1 and C2 horizons are 15 to 30 inches thick. They have hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3, 4, or 6. The C3, C4, and C5 horizons are 30 inches or more thick. They have hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 1 to 4, or 6. The C horizon is commonly sandy loam that has thin strata of loamy sand, fine sandy loam, or clay loam.

The Toccoa soils in the survey area have a mean annual soil temperature of about 57 degrees Fahrenheit and are a few degrees cooler than is defined for the Toccoa series. Behavior, use, and management are the same as for the Toccoa series and are considered as Toccoa series in the naming of map units.

Toxaway series

The Toxaway series consists of deep, poorly drained and very poorly drained soils that formed in loamy alluvial deposits. Permeability is moderate. Nearly level Toxaway soils are on flood plains in valleys of the Blue Ridge Mountains. They are commonly saturated with water from late in fall until early in spring. There is a high probability of frequent flooding during winter and spring. Slopes range from 0 to 3 percent.

Toxaway soils are on the same landscape with the Chatuge, Dillard, Toccoa, and Transylvania soils. Chatuge soils have a thinner surface layer than Toxaway soils and an argillic horizon. Dillard, Toccoa, and Transylvania soils are on somewhat higher lying, better drained landscapes. Dillard soils have an argillic horizon, and Toccoa soils are more sandy throughout than Toxaway soils.

Typical pedon of Toxaway silt loam, in an area of Toxaway silt loam, in a cultivated field, 6.6 miles north of Clayton on U.S. Highway 441, 0.4 mile southeast and 0.4 mile northeast on a field road, in Rabun County:

A11—0 to 10 inches; black (10YR 2/1) silt loam; moderate fine granular structure; very friable; common fine flakes of mica; common fine and medium roots; medium acid; abrupt smooth boundary.

A12—10 to 28 inches; black (10YR 2/1) silt loam; moderate medium granular structure; very friable; common fine flakes of mica; common fine and medium roots; medium acid; clear smooth boundary.

C1g—28 to 37 inches; very dark gray (10YR 3/1) silt loam; massive; friable; common fine flakes of mica; few fine roots; medium acid; clear smooth boundary.

C2g—37 to 46 inches; very dark gray (10YR 3/1) loam; massive; friable; many fine and medium flakes of mica; medium acid; clear smooth boundary.

C3g—46 to 60 inches; dark grayish brown (2.5Y 4/2) loamy sand; single grain; loose; many fine and medium flakes of mica; medium acid.

Alluvium ranges from 5 to 10 feet or more in thickness. Flakes of mica are common or many throughout.

The A horizon is 25 to 32 inches thick. It has hue of 10YR, value of 2 or 3, and chroma of 1 or 2; or it has neutral hue, value of 2 or 3, and no chroma.

The C horizon has hue of 10YR or 2.5Y, value of 3 to 5, and no chroma or chroma of 1 or 2. It is loam, loamy sand, silt loam, or sandy loam.

Transylvania series

The Transylvania series consists of deep, well drained or moderately well drained soils formed in loamy alluvial deposits. Permeability is moderate. Nearly level Transylvania soils are on flood plains in valleys of the Blue Ridge Mountains. The water table is within about 30 to 40 inches of the surface late in winter and early in spring. There is a high probability of frequent, brief flooding during winter and spring. Slopes range from 0 to 3 percent.

Transylvania soils are in similar positions in the landscape as Chatuge, Dillard, Toccoa, and Toxaway soils. Chatuge soils are poorly drained and have an argillic horizon. Dillard soils have an argillic horizon and are on higher lying stream terraces or toe slopes. Toccoa soils do not have a cumulic surface layer; they have a coarse loamy control section. Toxaway soils are poorly drained or very poorly drained, and are on lower lying flood plains.

Typical pedon of Transylvania silt loam, in an area of Transylvania-Toxaway complex, in a cultivated field, 3.9 miles north of Clayton on U.S. Highway 441, 0.1 mile east on paved road and 150 feet south on the east side of field road, in Rabun County:

Ap—0 to 12 inches; very dark gray (10YR 3/1) silt loam; moderate medium granular structure; very friable; common fine flakes of mica; common fine and medium roots; strongly acid; abrupt smooth boundary.

A1—12 to 25 inches; very dark grayish brown (10YR 3/2) silt loam; moderate medium granular structure; very friable; many fine flakes of mica; common fine roots; strongly acid; clear smooth boundary.

B21—25 to 32 inches; brown (10YR 4/3) silt loam; weak medium subangular blocky structure; friable; many fine flakes of mica; few fine roots; strongly acid; clear smooth boundary.

B22—32 to 38 inches; dark brown (7.5YR 3/2) silt loam; common medium faint strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; many fine flakes of mica; strongly acid; clear smooth boundary.

B23—38 to 46 inches; very dark gray (10YR 3/1) silt loam; few medium distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; many fine flakes of mica; strongly acid; gradual smooth boundary.

C—46 to 62 inches; very dark gray (10YR 3/1) stratified silt loam and sand; massive; loose, many fine and medium flakes of mica; strongly acid.

Solum thickness ranges from 40 to 60 inches or more. Depth to hard rock is 10 feet or more.

The A horizon is 24 to 31 inches thick. It has hue of 10YR, value of 2 or 3, and chroma of 1 or 2.

The B horizon is 20 to 40 inches thick. It has hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 2, 3, 4, or 6. It is silt loam or silty clay loam, with few or common, fine or medium, brown and gray mottles throughout.

The C horizon is stratified loamy and sandy alluvial sediment. Rounded pebbles and cobbles are 20 percent or less throughout.

The Transylvania soils in the survey area have a slightly lower color value in the lower B2 horizon than is permitted in the series range. Because use, behavior, and management are the same as for the Transylvania series, they are considered as the Transylvania series in the naming of map units.

Tusquitee series

The Tusquitee series consists of deep, well drained soils that formed in loamy sediment that were moved from higher lying soils. Permeability is moderate. These soils are in coves and on saddles, or at foot slopes of the Blue Ridge Mountains. Elevation commonly ranges from 1,700 to 4,200 feet. Slopes range from 4 to 45 percent but commonly are 25 to 45 percent.

Tusquitee soils are associated with the Ashe, Edneyville, Evard, Haywood, and Porters soils. Ashe, Edneyville, Evard, and Porters soils are in higher landscape positions in the mountains. Ashe, Edneyville, and Evard soils have an ochric epipedon and a thinner solum than Tusquitee soils. Porter soils have a thinner solum.

Haywood soils are on the same landscapes together with Tusquitee soils but are commonly in higher lying coves; Haywood soils have a cumulic surface layer.

Typical pedon of Tusquitee loam, in an area of Tusquitee-Haywood association, steep, about 0.25 mile northeast of Indian Grave Gap along High Shoals Creek where the creek abruptly turns to the northwest, in Towns County:

O1—2 inches to 0; layers of leaves, bark, and twigs in various stages of decomposition.

A11—0 to 2 inches; dark brown (7.5YR 3/2) loam; weak medium granular structure; very friable; 2 percent stones by volume; many fine and medium roots, few fine flakes of mica; medium acid; clear smooth boundary.

A12—2 to 11 inches; dark reddish brown (5YR 3/2) loam; weak medium granular structure; very friable; 2 percent stones by volume; many fine and medium roots; few fine flakes of mica; medium acid, clear smooth boundary.

B1—11 to 18 inches; brown (7.5YR 4/4) fine sandy loam; weak fine subangular structure; very friable; 5 percent stones by volume; many fine and medium roots; common fine flakes of mica; medium acid; clear wavy boundary.

B21t—18 to 44 inches; dark yellowish brown (10YR 4/4) clay loam; weak medium subangular structure; friable; 5 percent stones by volume; few fine and medium roots; common fine flakes of mica; medium acid; clear wavy boundary.

B22t—44 to 60 inches; dark yellowish brown (10YR 4/4) loam; weak fine granular structure; very friable; 5 percent stones by volume; few medium roots; common fine flakes of mica; medium acid.

Solum thickness ranges from 43 to 72 inches or more. Hard rock is commonly at depths of 6 feet or more. The soil is strongly acid or medium acid throughout. Fine flakes of mica are few or common throughout. Stones range to 15 percent by volume but are mostly less than 10 percent.

The A horizon is 6 to 10 inches thick. It has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 to 3.

The Bt horizon is 36 to 44 inches thick. It has hue of 5YR to 10YR, value of 4 or 5, and chroma of 3, 4, 6, or 8. It is clay loam, sandy clay loam, or loam.

The C horizon, if present, has hue of 10YR, value of 5 or 6, and chroma of 2, 3, 4, or 8. It is gravelly loam, cobbly loam, or fine sandy loam.

Classification of the soils

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

The system of classification has six categories. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. In this system the classification is based on the different soil properties that can be observed in the field or those that can be inferred either from other properties that are observable in the field or from the combined data of soil science and other disciplines. The properties selected for the higher categories are the result of soil genesis or of factors that affect soil genesis. In table 18, the soils of the survey area are classified according to the system. Categories of the system are discussed in the following paragraphs.

ORDER. Ten soil orders are recognized as classes in the system. The properties used to differentiate among orders are those that reflect the kind and degree of dominant soil-forming processes that have taken place. Each order is identified by a word ending in *sol*. An example is Entisol.

SUBORDER. Each order is divided into suborders based primarily on properties that influence soil genesis and are important to plant growth or that are selected to reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquent (*Aqu*, meaning water, plus *ent*, from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of expression of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and a prefix that suggests something about the properties of the soil. An example is Haplaquents (*Hapl*, meaning simple horizons, plus *aquent*, the suborder of Entisols that have an aquic moisture regime).

SUBGROUP. Each great group may be divided into three subgroups: the central (typic) concept of the great groups, which is not necessarily the most extensive subgroup; the intergrades, or transitional forms to other orders, suborders, or great groups; and the extragrades, which have some properties that are representative of the great groups but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that is thought to typify the great group. An example is Typic Haplaquents.

FAMILY. Families are established within a subgroup on the basis of similar physical and chemical properties that affect management. Among the properties considered in horizons of major biological activity below plow depth are particle-size distribution, mineral content, temperature regime, thickness of the soil penetrable by roots, consistence, moisture equivalent, soil slope, and permanent cracks. A family name consists of the name of a subgroup and a series of adjectives. The adjectives are the class names for the soil properties used as family differentiae. An example is fine-loamy, mixed, nonacid, mesic, Typic Haplaquents.

SERIES. The series consists of soils that formed in a particular kind of material and have horizons that, except for texture of the surface soil or of the underlying substratum, are similar in differentiating characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineral and chemical composition.

Formation of the soils

Glenn L. Bramlett, soil correlator, Soil Conservation Service, helped prepare this section.

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

Soil is produced as parent material, climate, relief, and plants and animals interact for a period of time (*5*). These factors determine the nature of the soil that forms at any point on the earth. Each of these factors affect the formation of soils, but the relative importance of each factor differs from place to place. In some areas one factor will dominate in the formation of a soil and determine most of the properties, for example, soils that formed in quartz commonly have faint horizons because quartz sand is highly resistant to weathering. Even in quartz sand, however, a distinct profile can be formed under certain types of vegetation if the relief is low and flat and if the water table is high. The five factors of soil formation are discussed in the paragraphs that follow.

Parent material

Parent material is the unconsolidated mass from which soil forms. It is largely responsible for the chemical and mineralogical composition of a soil. Most of the soil in Rabun and Towns Counties formed from residual material weathered from the underlying rock.

According to the geologic map of Georgia, 1976 (*4*), most of Rabun and Towns Counties is underlain by biotite and hornblende gneiss. A small area in the extreme west central part of Towns County is underlain by garnet mica schist. Narrow ridgetops and moderately steep hillsides are characteristic of this area, and Fannin soils dominant the landscape. Rabun County has more complex geological formations than Towns County. Extreme southeastern Rabun County is underlain by quartzite. Moderately steep, narrow to broad ridgetops and steep hillsides characterize the area, and Lily and Ramsey soils are dominant. A narrow band of granite gneiss is oriented northeast-southwest across the central part of Rabun County. This area is characterized by moderately steep or steep mountainsides, and Edneyville and Hayesville soils are dominant. Schist is in narrow irregular bands mostly in the eastern part of Rabun County. The proportion of felsic and mafic minerals in these parent rocks, as well as the quartz, is very resistant to weathering and limits the amount of clay in the soils. Ramsey soils, for example, formed in material weathered from siliceous rock and quartz sand and are very resistant to weathering. These soils, therefore, have faint horizons; in small, scattered areas hard rock is exposed. In contrast, Hayesville and Rabun soils formed from parent material less resistant to weathering and contain fairly large quantities of clay, chiefly from feldspars. Fannin soils also have appreciable amounts of clay, but the material from which these soils formed contains muscovite, which is resistant to weathering and is retained in the soil.

Some soils formed in old colluvium on the toe of slopes, or in coves and saddles of the mountains. The topography is concave and ranges from gently sloping to moderately steep; Bradson and Tusquitee soils are dominant.

The nearly level soils on the flood plains formed in recent alluvium and have little or no soil profile development. In places they are receiving sediment. Toccoa, Toxaway, and Transylvania soils are dominant.

Climate

Climate affects the formation of soils through its influence on the rate of weathering of rocks and on the decomposition of minerals and organic matter. It also affects biological activity in the soils and the leaching and movement of weathered material.

Rabun and Towns Counties have a moist temperate climate with an average winter temperature of about 41 degrees F and an average summer temperature of about 72 degrees F. The warm moist climate promotes rapid weathering of hard rock. Consequently, in much of the survey area the soils are from 2 to 5 feet thick over a thick layer of loose, disintegrated, weathered rock that blankets the hard rock underlying the area.

About 68 inches of precipitation falls annually and is evenly distributed throughout the year. Most of this precipitation percolates through the soil, moves dissolved or suspended materials downward, and leaves the soils generally low in bases. Plant remains decay rapidly and produce organic-acids that help to hasten the breakdown of minerals in the underlying rock. Thus, the organic matter content is low in the surface layer of most soils.

Relief

Relief influences soil formation through its effect on runoff, movement of water within the soil, plant cover, and to some extent, soil temperature.

The length, shape, and steepness of slopes hasten or delay runoff. Runoff is more rapid on steep slopes;

therefore, steep soils erode faster than level ones, even if both soils are of the same material. For example, steep Ashe soils commonly have thinner sola and have a more weakly expressed soil profile than Hayesville soils that formed in similar material on broad, gently sloping ridgetops. Rock outcrops also are more common on the sides of mountains.

A level or nearly level surface affords more time for water to penetrate and percolate through the soil profile. This in turn influences the solution and translocation of soluble materials. The amount of water available in the soil also determines to a significant extent the number and kinds of plants that grow there. For example, steep and very steep soils are generally drier than level or nearly level soils, and less vegetation grows on them.

Slopes in Rabun and Towns Counties range from nearly level to very steep. The effect of relief on soil temperature is pronounced in the mountainous areas. In general, slopes that have southern exposure are warmer than those that have northern exposure.

Plants and animals

Plants, animals, bacteria, and other organisms are active in the soil forming processes. The changes they bring about depend mainly on the life processes peculiar to each. The kinds of plants and animals that live on and in the soil are determined in turn by climate, parent material, relief, and age of the soil.

Most of the soils in Rabun and Towns Counties formed under a forest of hardwoods together with some softwoods at the higher elevations. These trees supply most of the organic matter available in the soils. The organic matter content in most of the soils is medium or low.

Growing plants provide cover that helps to reduce erosion and stabilize the surface soil. Leaves, twigs, roots, and plants accumulate on the surface of forest soils and then decompose through the action of percolating water and of micro-organisms, earthworms, and other forms of life. The roots of plants widen cracks in the rocks permitting more water to penetrate. Also, the uprooting of trees by wind influences the formation of soils through the mixing of soil layers and loosening of the underlying material.

Small animals, earthworms, insects, and micro-organisms influence the formation of soils by mixing organic matter into the soil, and by accelerating the formation of organic matter by breaking down the remains of plants. Small animals burrow into the soil and mix the layers. Earthworms and other small invertebrates feed on the organic matter in the upper few inches of the soil. They slowly but continually mix the soil material and alter it chemically. Bacteria, fungi, and other micro-organisms hasten the weathering of rocks and the decomposition of organic matter.

Time

Generally, a long time is required for a soil to form. Most of the soils on uplands have been in place long enough for distinct horizons to develop, but some soils that formed in alluvium have not.

Most soils in Rabun and Towns Counties have distinct horizons. The surface layer contains an accumulation of organic matter, and silicate clay minerals have formed and moved downward to produce horizons that are relatively high in clay content. Oxidation or reduction of iron has had an effect in such soils, depending on natural drainage. Many of the soils have been drained well enough to have a red or dark-red subsoil, and they contain highly oxidized iron. A few have impaired drainage, and consequently have a gray subsoil that has reduced iron. In addition, leaching of soluble calcium, magnesium, potassium, and other weatherable material has caused an increase in exchangeable hydrogen. Bradson and Dyke soils are examples of old, well drained, leached soils in Rabun and Towns Counties.

Soils that have essentially the same parent material and drainage commonly differ in degree of profile development because of time. Examples are the Dillard soils on stream terraces and the Transylvania soils on flood plains. These soils are similar in texture and occupy somewhat similar landscapes. Dillard soils, however, have been in place long enough to have a distinct subsoil that has an accumulation of clay. The Transylvania soils, however, have not been in place long enough for distinct horizons to form or for much clay to accumulate.

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Glossary

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

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

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

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

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

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

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coat, clay skin.

Coarse fragments. Mineral or rock particles up to 3 inches (2 millimeters to 7.5 centimeters) in diameter.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the bases of steep slopes.

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

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

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

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

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

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

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

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

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

Depth to rock. Bedrock at a depth that adversely affects the specified use.

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

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

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

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

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically for long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients, as for example in "hillpeats" and "climatic moors."

Drainage, surface. Runoff, or surface flow of water, from an area.

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

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

Excess fines. Excess silt and clay. The soil does not provide a source of gravel or sand for construction purposes.

Favorable. Favorable soil features for the specified use.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Flooding. The temporary covering of soil with water from overflowing streams, runoff from adjacent slopes, and tides. Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *occasional* that it occurs on an average of once or less in 2 years; and *frequent* that it occurs on an average of more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; *November-May*, for example, means that flooding can occur during the period November through May. Water standing for short periods after rainfall or commonly covering swamps and marshes is not considered flooding.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

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

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

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

Habitat. The natural abode of a plant or animal; refers to the kind of environment in which a plant or animal normally lives, as opposed to the range or geographical distribution.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. The major horizons of mineral soil are as follows:

O horizon.—An organic layer, fresh and decaying plant residue, at the surface of a mineral soil.

A horizon.—The mineral horizon, formed or forming at or near the surface, in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon most of which was originally part of a B horizon.

A2 horizon.—A mineral horizon, mainly a residual concentration of sand and silt high in content of resistant minerals as a result of the loss of silicate clay, iron, aluminum, or a combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or a combination of these; (2) by prismatic or blocky structure; (3) by redder or browner colors than those in the A horizon; or (4) by a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that from which the solum is presumed to have formed. If the material is known to differ from that in the solum the Roman numeral II precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

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

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—
Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Large stones. Rock fragments 10 inches (25 centimeters) or more across. Large stones adversely affect the specified use.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. Inadequate strength for supporting loads.

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

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

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

Nutrient, plant. Any element taken in by a plant, essential to its growth, and used by it in the production of food and tissue. Plant nutrients are nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, zinc, and perhaps other elements obtained from the soil; and carbon, hydrogen, and oxygen obtained largely from the air and water.

Parent material. The great variety of unconsolidated organic and mineral material in which soil forms. Consolidated bedrock is not yet parent material by this concept.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly. The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality that enables the soil to transmit water or air, measured as the number of inches per hour that water moves through the soil. Terms describing permeability are *very slow* (less than 0.06 inch), *slow* (0.06 to 0.20 inch), *moderately slow* (0.2 to 0.6 inch), *moderate* (0.6 to 2.0 inches), *moderately rapid* (2.0 to 6.0 inches), *rapid* (6.0 to 20 inches), and *very rapid* (more than 20 inches).

pH value. (See Reaction, soil). A numerical designation of acidity and alkalinity in soil.

Piping. Moving water of subsurface tunnels or pipelike cavities in the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from a semisolid to a plastic state.

Productivity (soil). The capability of a soil for producing a specified plant or sequence of plants under a specified system of management. Productivity is measured in terms of output, or harvest, in relation to input.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

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

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

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

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

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

Sandstone. Sedimentary rock containing dominantly sand-size particles.

Saprolite (geology). Soft, earthy, clay-rich, thoroughly decomposed rock formed in place by chemical weathering of igneous and metamorphic rock. In soil survey, the term saprolite is applied to any unconsolidated residual material underlying the soil and grading to hard bedrock below.

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

Series, soil. A group of soils, formed from a particular type of parent material, having horizons that, except for the texture of the A or surface horizon, are similar in all profile characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineralogical and chemical composition.

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

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

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

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

Soil. A natural, three-dimensional body at the earth's surface that is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in mature soil consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristics of the soil are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stratified. Arranged in strata, or layers. The term refers to geologic material. Layers in soils that result from the processes of soil formation are called horizons; those inherited from the parent material are called strata.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates that are separated from adjoining aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

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

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use or management.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that it can soak into the soil or flow slowly to a prepared outlet without harm. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

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

Thin layer. Otherwise suitable soil material too thin for the specified use.

Tilth, soil. The condition of the soil, especially the soil structure, as related to the growth of plants. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

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

Topsoil (engineering). Presumably a fertile soil or soil material, or one that responds to fertilization, ordinarily rich in organic matter, used to topdress roadbanks, lawns, and gardens.

Water table. The upper limit of the soil or underlying rock material that is wholly saturated with water.

Water table, apparent. A thick zone of free water in the soil. An apparent water table is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.

Water table, perched. A water table standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

ILLUSTRATIONS

Figure 1.—The Bradson soils in the immediate foreground and the Transylvania and Toxaway soils on the adjacent flood plain are well suited to farming. The Evard soils on the mountains have fair potential for hickory and many species of pine and oak. The Hayesville soils on the lower areas below the steep Evard soils have good potential for yellow-poplar and many species of pine and oak.

Figure 2.—Well managed farm pond on the moderately steep Hayesville-Bradson-Fannin map unit. Improved grass pasture on the Fannin soils, and well managed woodland on Hayesville soils help control erosion and reduce runoff.

Figure 3.—Planted pines on Bradson fine sandy loam, 10 to 25 percent slopes. This soil has a high site index and good break potential for eastern white pine, Virginia pine, and shortleaf pine.

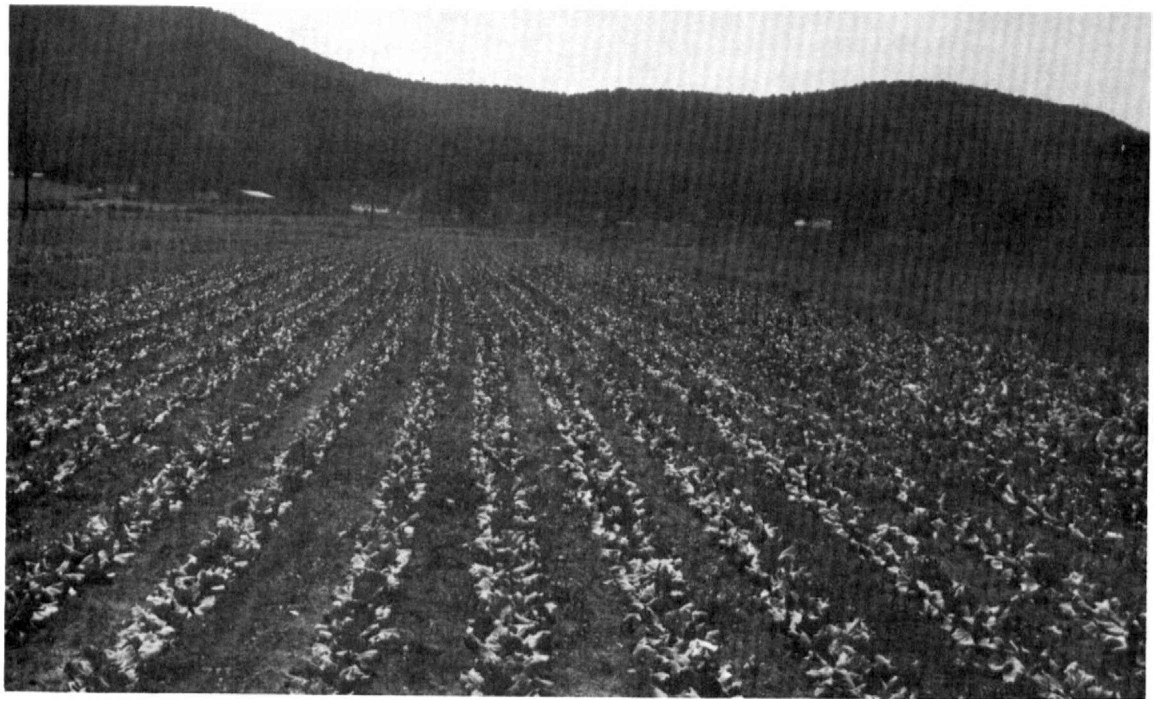

Figure 4.—Cabbage on Toxaway silt loam. The soil has been drained and has good potential for common truck crops.

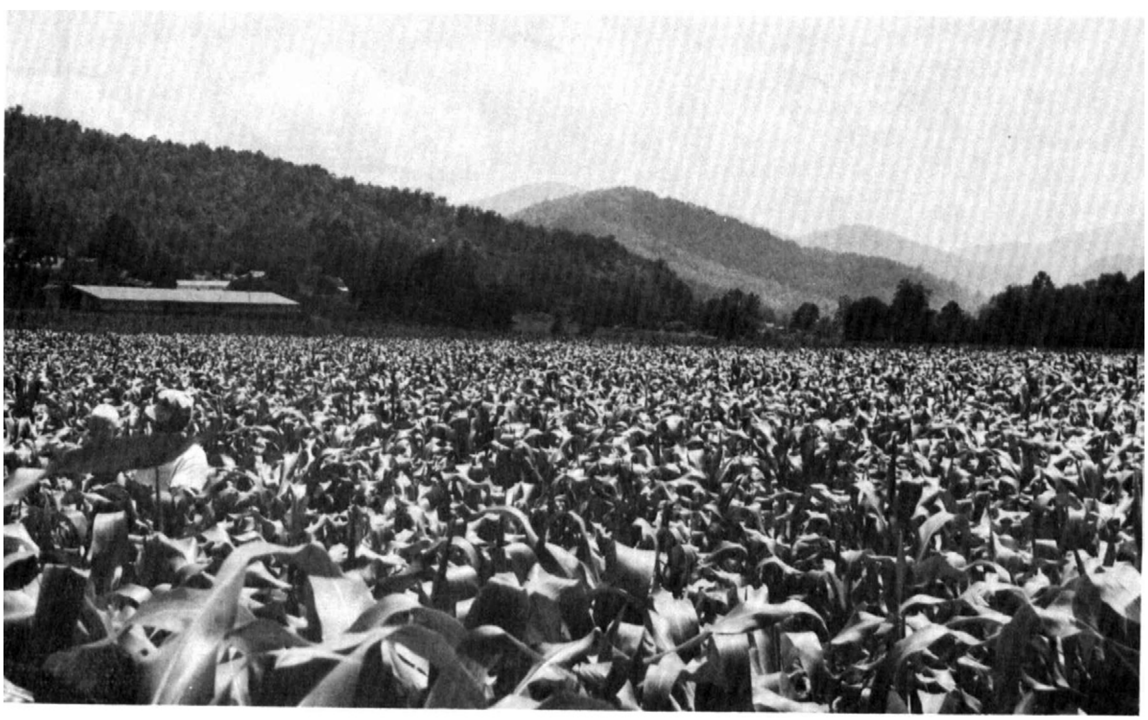

Figure 5.—Corn on Transylvania-Toxaway complex. The map unit has been tile drained and has good potential for common row crops.

Figure 6.—Cattle grazing tall fescue and clover on Dillard sandy loam, 2 to 6 percent slopes. This soil has good potential for hay and pasture.

Figure 7.—Camping on Dyke loam, 2 to 10 percent slopes. This soil has good potential for most recreational uses.

TABLES

TABLE 1.--TEMPERATURE AND PRECIPITATION DATA

[Data were recorded in the period 1951-75 at Clayton, Ga.]

Month	Temperature: Average daily maximum	Temperature: Average daily minimum	Temperature: Average	Temperature: 2 years in 10 will have-- Maximum temperature higher than--	Temperature: 2 years in 10 will have-- Minimum temperature lower than--	Temperature: Average number of growing degree days[1]	Precipitation: Average	Precipitation: 2 years in 10 will have-- Less than--	Precipitation: 2 years in 10 will have-- More than--	Precipitation: Average number of days with 0.10 inch or more	Precipitation: Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	52.4	29.1	39.2	72	4	147	6.47	4.11	8.60	10	1.5
February---	54.6	29.9	42.3	73	6	27	6.91	4.32	9.24	10	1.7
March------	61.4	35.4	48.5	80	16	97	7.40	5.01	9.59	10	2.0
April------	71.3	43.3	55.0	87	25	447	6.11	3.92	8.09	8	.0
May--------	77.5	51.2	64.4	90	33	446	5.63	3.08	7.70	9	.0
June-------	82.7	58.4	70.6	94	44	618	5.52	3.44	7.40	9	.0
July-------	85.0	62.1	70.6	94	51	853	6.09	3.72	8.21	11	.0
August-----	84.8	61.5	73.2	92	50	719	5.52	2.75	7.77	8	.0
September--	79.7	56.0	67.9	91	39	537	5.31	2.71	7.44	7	.0
October----	72.3	44.6	58.5	86	24	269	4.70	1.54	7.22	6	.0
November---	62.4	35.4	48.9	79	14	60	5.17	3.38	6.80	7	.1
December---	53.7	30.1	41.9	73	7	29	6.88	3.65	9.52	9	1.0
Year-----	69.8	44.8	56.8	96	1	4,249	71.71	62.24	80.88	104	6.3

[1]A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50° F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Data were recorded in the period 1951-75 at Clayton, Ga.]

Probability	Temperature		
	24°F or lower	28°F or lower	32°F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	April 13	April 24	May 9
2 years in 10 later than--	April 5	April 18	May 3
5 years in 10 later than--	March 21	April 8	April 21
First freezing temperature in fall:			
1 year in 10 earlier than--	October 25	October 13	October 7
2 years in 10 earlier than--	October 31	October 19	October 12
5 years in 10 earlier than--	November 10	October 30	October 22

TABLE 3.--GROWING SEASON LENGTH

[Data were recorded in the period 1951-75 at Clayton, Ga.]

Probability	Daily minimum temperature during growing season		
	Higher than 24°F	Higher than 28°F	Higher than 32°F
	Days	Days	Days
9 years in 10	209	182	160
8 years in 10	217	189	168
5 years in 10	233	204	183
2 years in 10	250	218	198
1 year in 10	258	226	205

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

[Areas of inland water total 4,288 acres in Rabun County and 4,032 acres in Towns County. This acreage is not included in the total]

Map symbol	Soil name	Rabun County	Towns County	Total-- Area	Extent
		Acres	Acres	Acres	Pct
ACE	Ashe-Porters association, moderately steep	3,580	1,420	5,000	1.5
ADG	Ashe association, stony, very steep	11,690	5,620	17,310	5.1
BrC	Bradson fine sandy loam, 2 to 10 percent slopes	3,310	4,580	7,890	2.3
BrE	Bradson fine sandy loam, 10 to 25 percent slopes	22,260	5,250	27,510	8.0
Ch	Chatuge loam	590	1,280	1,870	0.5
DhC	Dillard sandy loam, 2 to 6 percent slopes	1,030	860	1,890	0.6
DyC	Dyke loam, 2 to 10 percent slopes	1,260	1,630	2,890	0.8
DyE	Dyke loam, 10 to 25 percent slopes	1,730	700	2,430	0.7
EdE	Edneyville sandy loam, 10 to 25 percent slopes	7,862	2,420	10,282	3.0
EPF	Edneyville-Ashe association, stony, steep	13,320	13,340	26,660	7.8
EVF	Evard association, steep	10,650	4,530	15,180	4.4
FaC	Fannin fine sandy loam, 2 to 10 percent slopes	0	380	380	0.1
FaE	Fannin fine sandy loam, 10 to 25 percent slopes	0	1,830	1,830	0.5
HaC	Hayesville fine sandy loam, 2 to 10 percent slopes	300	1,420	1,720	0.5
HaE	Hayesville fine sandy loam, 10 to 25 percent slopes	22,380	11,928	34,308	10.0
LhE	Lily fine sandy loam, 10 to 25 percent slopes	2,280	0	2,280	0.7
PCF	Porters association, stony, steep	12,490	10,190	22,680	6.6
PCG	Porters association, stony, very steep	5,900	5,000	10,900	3.2
RaE	Rabun loam, 10 to 25 percent slopes	2,770	1,430	4,200	1.2
RbF	Rabun stony loam, 25 to 50 percent slopes	3,500	1,200	4,700	1.4
RLF	Ramsey-Lily association, stony, steep	2,790	0	2,790	0.8
Rx	Rock outcrop	940	360	1,300	0.4
SAE	Saluda association, moderately steep	12,930	110	13,040	3.8
SAF	Saluda association, steep	35,260	1,600	36,860	10.9
SBG	Saluda and Ashe stony soils, very steep	6,770	320	7,090	2.1
To	Toccoa fine sandy loam	1,250	930	2,180	0.6
Tp	Toxaway silt loam	2,980	700	3,680	1.1
Tr	Transylvania-Toxaway complex	4,580	2,920	7,500	2.2
TuC	Tusquitee loam, 4 to 10 percent slopes	2,460	2,570	5,030	1.5
TuE	Tusquitee loam, 10 to 25 percent slopes	10,150	4,880	15,030	4.4
TVF	Tusquitee-Haywood association, steep	28,700	16,650	45,350	13.3
	Total	235,712	106,048	341,760	100.0

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be estimated under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Soil name and map symbol	Corn	Corn silage	Wheat	Grass-legume hay	Cool season grass
	Bu	Ton	Bu	Ton	AUM*
ACE**:					
Ashe	---	---	---	2.0	4.0
Porters	---	---	---	3.8	7.5
ADG** Ashe	---	---	---	---	---
BrC Bradson	115	23	45	5.8	9.0
BrE Bradson	---	---	---	5.0	8.0
Ch Chatuge	80	16	40	4.0	7.0
DhC Dillard	100	20	---	7.0	12.0
DyC Dyke	125	26	50	5.5	9.0
DyE Dyke	85	18	30	4.0	7.5
EdE Edneyville	---	---	---	---	5.5
EPF**:					
Edneyville	---	---	---	---	5.0
Ashe	---	---	---	---	3.5
EVF** Evard	---	---	---	---	---
FaC Fannin	60	15	35	3.0	5.5
FaE Fannin	---	---	---	---	4.0
HaC Hayesville	90	15	50	3.4	6.5
HaE Hayesville	---	---	---	---	5.0
LhE Lily	---	---	---	2.5	5.0
PCF**, PCG** Porters	---	---	---	---	---
RaE Rabun	---	---	---	4.0	7.0
RbF Rabun	---	---	---	---	---
RLF**:					
Ramsey	---	---	---	---	---
Lily	---	---	---	---	---

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Corn silage	Wheat	Grass-legume hay	Cool season grass
	Bu	Ton	Bu	Ton	AUM*
Rx**: Rock outcrop	---	---	---	---	---
SAE**: Saluda	---	---	---	2.0	4.5
SAF**: Saluda	---	---	---	---	---
SBG**:					
Saluda	---	---	---	---	---
Ashe	---	---	---	---	---
To: Toccoa	85	18	---	4.0	6.5
Tp: Toxaway	110	20	---	6.0	10
Tr: Transylvania	125	24	---	5.0	8.5
TuC: Tusquitee	100	20	60	4.0	8.0
TuE: Tusquitee	---	---	---	3.5	6.0
TVF**:					
Tusquitee	---	---	---	---	---
Haywood	---	---	---	---	---

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.
** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 6.--CAPABILITY CLASSES AND SUBCLASSES

[Miscellaneous areas are excluded. Dashes indicate no acreage]

Class	Total acreage	Major management concerns (Subclass)		
		Erosion (e)	Wetness (w)	Soil problem (s)
		Acres	Acres	Acres
I:				
Rabun County	---	---	---	---
Towns County	---	---	---	---
II:				
Rabun County	9,850	1,260	8,590	---
Towns County	6,110	1,630	4,480	---
III:				
Rabun County	7,910	6,070	1,840	---
Towns County	10,780	8,570	2,210	---
IV:				
Rabun County	4,010	4,010	---	---
Towns County	1,080	1,080	---	---
V:				
Rabun County	---	---	---	---
Towns County	---	---	---	---
VI:				
Rabun County	81,932	81,932	---	---
Towns County	27,438	27,438	---	---
VII:				
Rabun County	131,070	84,170	---	46,900
Towns County	60,280	24,930	---	35,350
VIII:				
Rabun County	---	---	---	---
Towns County	---	---	---	---

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that the information was not available. Site index was calculated at age 30 for eastern cottonwood, at age 35 for American sycamore, and at age 50 for all other species]

Soil name and map symbol	Potential productivity: Preferred species	Site index 1/	Optimum annual growth2/: Cubic feet	Optimum annual growth2/: Board feet	Acceptable species	Management concerns: Erosion hazard	Management concerns: Equipment limitations	Remarks
ACE:								
Ashe	Chestnut oak Scarlet oak	60 60	50 50	150 150	Black oak, pitch pine.	Slight	Slight	Infrequent ice damage. Loblolly pine is suitable for planting at lower elevations.
Porters	Northern red oak White oak Yellow-poplar	70 70 90	58 69 --	200 260 200	Eastern white pine.	Slight	Slight	Steep slopes.
ADG Ashe	Chestnut oak Scarlet oak	50 50	45 45	125 125	Black oak, pitch pine, shortleaf pine,3 eastern white pine.3	Severe	Severe	Very steep slopes, excessive rockiness in places.
BrC Bradson	Shortleaf pine Yellow-poplar Northern red oak	80 90 80	153 -- 69	500 200 260	Eastern white pine, Virginia pine.	Slight	Slight	Seasonal wetness. Loblolly pine is suitable for planting.
BrE Bradson	Shortleaf pine Yellow-poplar Northern red oak	80 90 80	153 -- 69	500 200 260	Eastern white pine, Virginia pine.	Moderate	Slight	Loblolly pine is suitable for planting.
Ch Chatuge	White oak Yellow-poplar	80 100	80 --	320 320	Northern red oak, hemlock.	Slight	Moderate	Seasonal wetness. Loblolly pine is suitable for planting.
DhC Dillard	White oak Yellow-poplar	80 110 110	80 -- --	320 440 440	Eastern white pine, Northern red oak	Slight	Moderate	Seasonal wetness. Loblolly pine and and sycamore are suitable for planting.
DyC Dyke	Northern red oak White oak Yellow-poplar	80 80 120	69 80 --	260 320 600	Eastern white pine, shortleaf pine, hemlock.	Slight	Moderate	Clayey subsoil, very sticky, wetness, ruts easily. Loblolly pine and sycamore are suitable for planting.
DyE Dyke	Northern red oak White oak Yellow-poplar Yellow-poplar	80 80 120 120	69 80 -- --	260 320 600 600	Eastern white pine, shortleaf pine, hemlock.	Moderate	Moderate	Clayey subsoil, very sticky, wetness, ruts easily. Loblolly pine and sycamore are suitable for planting.

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Potential productivity: Preferred species	Site index 1/	Optimum annual growth2/: Cubic feet	Optimum annual growth2/: Board feet	Acceptable species	Management concerns: Erosion hazard	Management concerns: Equipment limitations	Remarks
EdE: Edneyville	Northern red oak	70	58	200	Scarlet oak, shortleaf pine, hickory.	Slight	Slight	Loblolly pine and sycamore are suitable for planting at lower elevations.
	Eastern white pine	90	--	800				
	White oak	70	69	260				
EPF: Edneyville	Chestnut oak	60	47	140	Northern red oak, shortleaf pine.1	Moderate	Moderate	Steep slopes, stoniness in places.
	Eastern white pine	70	--	600				
	Scarlet oak	60	47	140				
Ashe	Chestnut oak	50	45	125	Black oak, pitch pine, shortleaf pine,3 eastern white pine.3	Moderate	Moderate	Very steep slopes, excessive rockiness in places.
	Scarlet oak	50	45	125				
EVF: Evard	Shortleaf pine	70	130	400	White oak, scarlet oak, hickory.	Moderate	Moderate	Steep slopes.
	Northern red oak	70	58	200				
	Eastern white pine	90	--	800				
FaC: Fannin	Shortleaf pine	70	130	400	White oak, scarlet oak, hickory.	Slight	Slight	Loblolly pine, yellow-poplar, and sycamore are suitable for planting at lower elevations.
	Eastern white pine	90	--	800				
	Northern red oak	70	58	200				
FaE: Fannin	Shortleaf pine	70	130	400	White oak, scarlet oak, hickory.	Moderate	Slight	Loblolly pine, yellow-poplar, and sycamore are suitable for planting at lower elevations.
	Eastern white pine	90	--	800				
	Northern red oak	70	58	200				
HaC: Hayesville	Shortleaf pine	70	180	400	White oak, scarlet oak, hickory.	Slight	Slight	Loblolly pine, yellow-poplar, and sycamore are suitable for planting at lower elevations.
	Eastern white pine	90	--	800				
	Northern red oak	70	58	200				
HaE: Hayesville	Shortleaf pine	70	130	400	White oak, scarlet oak, hickory.	Moderate	Slight	Loblolly pine, yellow-poplar, and sycamore are suitable for planting at lower elevations.
	Eastern white pine	90	--	800				
	Northern red oak	70	58	200				
LhE: Lily	Shortleaf pine	70	105	300	Black oak, scarlet oak.	Slight	Slight	
PCF: Porters	Northern red oak	70	58	200	Eastern white pine.	Moderate	Moderate	Steep slopes.
	White oak	70	69	260				
	Yellow-poplar	90	--	200				
PCG: Porters	Northern red oak	80	69	260	Eastern white pine.	Moderate	Severe	Very steep slopes.
	White oak	80	80	320				
	Yellow-poplar	90	--	200				

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Potential productivity: Preferred species	Site index 1/	Optimum annual growth2/: Cubic feet	Optimum annual growth2/: Board feet	Acceptable species	Management concerns: Erosion hazard	Management concerns: Equipment limitations	Remarks
RaE-- Rabun	Red oak--	70	58	200	Shortleaf pine, black oak.	Moderate	Slight	Loblolly pine and yellow-poplar are suitable for planting at lower elevations.
	Shortleaf pine--	70	130	400				
	White oak--	70	69	260				
RbF-- Rabun	Northern red oak-	70	58	200	Shortleaf pine, black oak.	Moderate	Moderate	Steep slopes.
	Shortleaf pine--	70	105	400				
	White oak--	70	69	260				
RLF:								
Ramsey--	Shortleaf pine--	50	80	200	Scarlet oak, eastern white pine.	Moderate	Moderate	
	Black oak--	50	49	150				
Lily--	Shortleaf pine--	60	105	300	Black oak, scarlet oak.	Moderate	Moderate	
SAE-- Saluda	White pine--	70	--	600	Black oak, red oak.	Moderate	Slight	
	Shortleaf pine--	60	105	300				
	Scarlet oak--	60	50	150				
SAF-- Saluda	Shortleaf pine--	60	105	300	Black oak, red oak.	Moderate	Moderate	Steep slopes.
	Scarlet oak--	60	50	150				
	Eastern white pine--	70	--	600				
SBG:								
Saluda--	Shortleaf pine--	60	105	300	Black oak, red oak.	Severe	Severe	Very steep slopes.
	Scarlet oak--	60	50	300				
	Eastern white pine--	70	--	600				
Ashe--	Chestnut oak--	50	45	125	Black oak, pitch pine, shortleaf pine,3 eastern white pine.3	Severe	Severe	Very steep slopes, excessive rockiness in places.
	Scarlet oak--	50	45	125				
To-- Toccoa	White oak--	>80	80	320	Northern red oak, eastern white pine, hemlock.	Slight	Moderate	Seasonally wet. Lolblolly pine, yellow-poplar, and sycamore are suitable for planting.
	Yellow-poplar--	120	--	600				
Tp-- Toxaway	White oak--	>80	80	320	Northern red oak, eastern white pine, hemlock.	Slight	Moderate	Seasonally wet. Loblolly pine, yellow-poplar, and sycamore are suitable for planting.
	Yellow-poplar--	120	--	600				
Tr:								
Transylvania--	White oak--	>80	80	320	Northern red oak, eastern white pine, hemlock.	Slight	Moderate	Seasonally wet. Loblolly pine, yellow-poplar, and sycamore are suitable for planting.
	Yellow-poplar--	120	--	600				

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Potential productivity: Preferred species	Site index 1/	Optimum annual growth2/: Cubic feet	Board feet	Acceptable species	Management concerns: Erosion hazard	Equipment limitations	Remarks
Toxaway	White oak	>80	80	320	Northern red oak, eastern white pine, hemlock.	Slight	Moderate	Seasonally wet. Loblolly pine and sycamore are suitable for planting.
	Yellow-poplar	120	00	600				
TuC: Tusquitee	White oak	80	80	320	Eastern white pine, hemlock.	Slight	Slight	Seasonally wet.
	Yellow-poplar	120	--	600				
	Northern red oak	80	69	260				
TuE: Tusquitee	Northern red oak	80	69	260	Eastern white pine, hemlock.	Slight	Slight	Loblolly pine, yellow-poplar, and sycamore are suitable for planting.
	Yellow-poplar	120	--	600				
	White oak	80	80	320				
TVF: Tusquitee	Northern red oak	80	69	260	Eastern white pine. hemlock.	Moderate	Moderate	Loblolly pine, yellow-poplar, and sycamore are suitable for planting.
	Yellow-poplar	120	--	600				
	White oak	80	80	320				
Haywood	Northern red oak	80	69	260	Eastern white pine, hemlock.			Loblolly pine, yellow-poplar, and sycamore are suitable for planting.
	Yellow-poplar	120	--	600				
	White oak	80	80	320				

1Site index based on local data.

2Saw timber volume measured by Scribner Decimal C. Pulpwood volume from local volume tables prepared by U.S. Forest Service.

3These trees grow at lower elevations only.

TABLE 8.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
ACE*:					
Ashe	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Porters	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
ADG* Ashe	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
BrC Bradson	Moderate: too clayey	Moderate: low strength.	Moderate: low strength.	Severe: slope.	Moderate: low strength.
BrE Bradson	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Ch Chatuge	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.
DhC Dillard	Severe: wetness.	Moderate: wetness, low strength.	Severe: wetness.	Moderate: wetness, low strength, slope.	Moderate: low strength.
DyC Dyke	Severe: too clayey.	Severe: low strength.	Severe: low strength.	Severe: low strength.	Severe: low strength.
DyE Dyke	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
EdE Edneyville	Severe: slope.	Severe: slope.	Severe: depth to rock.	Severe: slope.	Severe: slope.
EPF*:					
Edneyville	Severe: slope, large stones.	Severe: slope, large stones.	Severe: large stones, slope.	Severe: large stones, slope.	Severe: slope.
Ashe	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
EVF* Evard	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
FaC Fannin	Severe: depth to rock.	Moderate: low strength.	Severe: depth to rock.	Moderate: low strength, depth to rock.	Severe: low strength.
FaE Fannin	Severe: depth to rock.	Severe: slope.	Severe: depth to rock.	Severe: depth to rock.	Severe: low strength.
HaC Hayesville	Moderate: too clayey.	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.	Moderate: low strength.
HaE Hayesville	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
LhE Lily	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
PCF*, PCG*: Porters	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
RaE, RbF: Rabun	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
RLF*:					
Ramsey	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.
Lily	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.
Rx* Rock outcrop					
SAE*, SAF*: Saluda	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
SBG*:					
Saluda	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Ashe	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
To: Toccoa	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.
Tp: Toxaway	Severe: wetness, cutbanks cave.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.
Tr*:					
Transylvania	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods.
Toxaway	Severe: wetness, cutbanks cave.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.
TuC: Tusquitee	Slight	Slight	Slight	Moderate: slope.	Slight.
TuE: Tusquitee	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
TvF*:					
Tusquitee	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Haywood	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

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

TABLE 9.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," and "fair." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
ACE*:					
Ashe	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, seepage.	Severe: seepage, slope.	Poor: slope, thin layer.
Porters	Severe: slope, depth to rock.	Severe: seepage, slope.	Severe: seepage, depth to rock.	Severe: slope, seepage.	Poor: slope.
ADG* Ashe	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, seepage.	Severe: seepage, slope.	Poor: slope, thin layer.
BrC Bradson	Slight	Moderate: seepage.	Moderate: too clayey.	Slight	Poor: too clayey.
BrE Bradson	Severe: slope.	Severe: slope.	Moderate: too clayey.	Severe: slope.	Poor: too clayey.
Ch Chatuge	Severe: wetness, floods.	Severe: wetness, floods, seepage.	Severe: wetness, floods, seepage.	Severe: wetness, floods, seepage.	Poor: wetness.
DhC Dillard	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey,	Severe: wetness.	Fair: too clayey. wetness.
DyC Dyke	Moderate: percs slowly.	Moderate: seepage.	Severe: too clayey.	Slight	Poor: too clayey.
DyE Dyke	Severe: slope.	Severe: slope.	Severe: too clayey.	Severe: slope.	Poor: slope.
EdE Edneyville	Severe: slope.	Severe: seepage.	Severe: seepage, depth to rock.	Severe: seepage.	Fair: slope.
EpF*:					
Edneyville	Severe: large stones, slope.	Severe: seepage, slope.	Severe: seepage, large stones, slope.	Severe: seepage.	Poor: slope, large stones.
Ashe	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, seepage.	Severe: seepage, slope.	Poor: slope, thin layer.
EVF* Evard	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
FaC Fannin	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Slight	Fair: thin layer.
FaE Fannin	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope.	Poor: slope.
HaC Hayesville	Moderate: percs slowly.	Moderate: slope, seepage.	Moderate: too clayey.	Slight	Fair: too clayey.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
HaE: Hayesville	Severe: slope.	Severe: slope.	Moderate: too clayey.	Severe: slope.	Poor: slope.
LhE: Lily	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: slope, seepage.	Poor: slope.
PCF*, PCG*: Porters	Severe: slope, depth to rock.	Severe: seepage, slope.	Severe: seepage, depth to rock, slope.	Severe: slope, seepage.	Poor: slope.
RaE: Rabun	Severe: slope.	Severe: slope.	Moderate: too clayey, slope.	Severe: slope.	Poor: slope.
RbF: Rabun	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: small stones, slope.
RLF*:					
Ramsey	Severe: slope, depth to rock.	Severe: slope, depth to rock, seepage.	Severe: slope, depth to rock, seepage.	Severe: slope, seepage.	Poor: slope, thin layer, area reclaim.
Lily	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, seepage.	Poor: slope.
Rx*. Rock outcrop					
SAE*: Saluda	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.	Poor: slope.
SAF*: Saluda	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
SBG*:					
Saluda	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Ashe	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, seepage.	Severe: seepage, slope.	Poor: slope, thin layer.
To: Toccoa	Severe: floods.	Severe: floods, seepage.	Severe: floods, seepage.	Severe: floods, seepage.	Good.
Tp: Toxaway	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Poor: wetness, excess humus.
Tr*:					
Transylvania	Severe: floods, wetness.	Severe: floods, seepage.	Severe: floods, wetness.	Severe: floods, wetness.	Good.
Toxaway	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Poor: wetness, excess humus.
TuC: Tusquitee	Slight	Severe: slope.	Severe: seepage.	Severe: seepage.	Good.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
TuE----------------- Tusquitee	Severe: slope.	Severe: slope.	Severe: seepage.	Severe: slope, seepage.	Poor: slope.
TVF*:					
Tusquitee----------	Severe: slope.	Severe: slope.	Severe: seepage.	Severe: slope, seepage.	Poor: slope.
Haywood------------	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.

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

TABLE 10.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and "poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
ACE*:				
Ashe	Poor: thin layer.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer.
Porters	Fair: low strength, slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
ADG*: Ashe	Poor: thin layer, slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer.
BrC, BrE: Bradson	Fair: low strength, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, area reclaim.
Ch: Chatuge	Fair: low strength, wetness, shrink-swell.	Poor: excess fines.	Unsuited: excess fines.	Fair: thin layer.
DhC: Dillard	Poor: low strength.	Poor: excess fines.	Unsuited: excess fines.	Fair: small stones, thin layer.
DyC: Dyke	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
DyE: Dyke	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
EdE: Edneyville	Poor: slope.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer, slope.
EPF*:				
Edneyville	Poor: slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, large stones.
Ashe	Poor: thin layer, slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer.
EVF*: Evard	Poor: slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
FaC, FaE: Fannin	Poor: low strength, thin layer.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, area reclaim.
HaC, HaE: Hayesville	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, area reclaim.
LhE: Lily	Fair: slope, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
PCF*, PCG*: Porters	Poor: slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
RaE------------------- Rabun	Fair: low strength, slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
RbF------------------- Rabun	Poor: slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
RLF*:				
Ramsey---------------	Poor: slope, thin layer, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, depth to rock.
Lily-----------------	Poor: slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
Rx*. Rock outcrop				
SAE*------------------ Saluda	Fair: thin layer, slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
SAF*------------------ Saluda	Poor: slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
SBG*:				
Saluda---------------	Poor: slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
Ashe-----------------	Poor: thin layer, slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer.
To-------------------- Toccoa	Good-----------------	Poor: excess fines.	Unsuited: excess fines.	Good.
Tp-------------------- Toxaway	Poor: wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
Tr*:				
Transylvania---------	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Toxaway--------------	Poor: wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
TuC------------------- Tusquitee	Good-----------------	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
TuE------------------- Tusquitee	Fair: slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
TVF*:				
Tusquitee------------	Poor: slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
Haywood--------------	Poor: slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: large stones.

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

TABLE 11.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated]

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
ACE*:						
Ashe	Severe: depth to rock, seepage.	Severe: depth to rock.	Not needed	Not needed	Slope, depth to rock.	Slope, rooting depth.
Porters	Severe: seepage.	Moderate: piping.	Not needed	Slope	Slope, depth to rock.	Slope, depth to rock.
ADG*: Ashe	Severe: depth to rock, seepage.	Severe: depth to rock.	Not needed	Not needed	Slope, depth to rock.	Slope, rooting depth.
BrC: Bradson	Slight	Moderate: low strength, compressible.	Not needed	Favorable	Favorable	Favorable.
BrE: Bradson	Slight	Moderate: low strength, compressible.	Not needed	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Ch: Chatuge	Moderate: seepage.	Slight	Floods	Wetness, floods.	Wetness, floods.	Wetness.
DhC: Dillard	Slight	Moderate: hard to pack, wetness.	Wetness	Wetness	Wetness	Favorable.
DyC, DyE: Dyke	Moderate: slope.	Moderate: compressible, low strength.	Not needed	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
EdE: Edneyville	Severe: seepage.	Moderate: piping.	Not needed	Slope, seepage.	Not needed	Slope.
EPF*:						
Edneyville	Severe: seepage.	Severe: thin layer, piping.	Not needed	Slope	Large stones	Large stones.
Ashe	Severe: depth to rock, seepage.	Severe: depth to rock.	Not needed	Not needed	Slope, depth to rock.	Slope, rooting depth.
EVF*: Evard	Moderate: seepage.	Moderate: thin layer.	Not needed	Slope, large stones.	Slope, large stones.	Slope, large stones.
FaC, FaE: Fannin	Moderate: depth to rock.	Severe: low strength, hard to pack.	Not needed	Complex slope, rooting depth.	Complex slope, depth to rock.	Erodes easily, rooting depth.
HaC: Hayesville	Moderate: seepage.	Severe: low strength.	Not needed	Slope, erodes easily.	Favorable	Slope, erodes easily.
HaE: Hayesville	Moderate: seepage.	Severe: low strength.	Not needed	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
LhE: Lily	Severe: depth to rock, seepage, slope.	Severe: thin layer, piping.	Not needed	Seepage, rooting depth, slope.	Depth to rock, slope.	Rooting depth, slope.
PCF*, PCG*: Porters	Severe: seepage.	Moderate: piping.	Not needed	Slope	Slope, depth to rock.	Slope, depth to rock.

See footnote at end of table.

TABLE 11.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
RaE----------------Rabun	Moderate: seepage.	Moderate: seepage, piping.	Not needed-----	Slope----------	Slope----------	Slope.
RbF----------------Rabun	Moderate: seepage.	Moderate: hard to pack.	Not needed-----	Slope, large stones.	Slope, large stones.	Slope, large stones.
RLF*:						
Ramsey-----------	Severe: depth to rock.	Severe: thin layer.	Not needed-----	Complex slope, rooting depth.	Slope, depth to rock.	Depth to rock, slope.
Lily-------------	Severe: depth to rock, seepage, slope.	Severe: thin layer, piping.	Not needed-----	Seepage, rooting depth, slope.	Depth to rock, slope.	Rooting depth, slope.
Rx*. Rock outcrop						
SAE*, SAF*--------Saluda	Severe: slope.	Severe: thin layer.	Not needed-----	Slope----------	Slope----------	Slope.
SBG*:						
Saluda-----------	Severe: slope.	Severe: thin layer.	Not needed-----	Slope----------	Slope----------	Slope.
Ashe-------------	Severe: depth to rock, seepage.	Severe: depth to rock.	Not needed-----	Not needed-----	Slope, depth to rock.	Slope, rooting depth.
To----------------Toccoa	Severe: seepage.	Moderate: piping.	Not needed-----	Floods, seepage.	Not needed-----	Not needed.
Tp----------------Toxaway	Severe: seepage.	Moderate: seepage, piping.	Wetness, cutbanks cave.	Wetness, seepage, floods.	Not needed-----	Wetness.
Tr*:						
Transylvania-----	Severe: seepage.	Moderate: seepage, piping.	Floods---------	Favorable------	Not needed-----	Not needed.
Toxaway----------	Severe: seepage.	Moderate: seepage, piping.	Wetness, cutbanks cave.	Wetness, seepage, floods.	Not needed-----	Wetness.
TuC---------------Tusquitee	Moderate: seepage.	Moderate: seepage, piping.	Not needed-----	Slope----------	Favorable------	Favorable.
TuE---------------Tusquitee	Moderate: seepage.	Moderate: seepage, piping.	Not needed-----	Slope----------	Slope----------	Slope.
TVF*:						
Tusquitee--------	Moderate: seepage.	Moderate: seepage, piping.	Not needed-----	Slope----------	Slope----------	Slope.
Haywood----------	Severe: seepage.	Severe: large stones, seepage.	Not needed-----	Slope----------	Large stones, slope.	Large stones, slope.

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

TABLE 12.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
ACE*:				
Ashe	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Porters	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
ADG* Ashe	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
BrC Bradson	Slight	Slight	Severe: slope.	Slight.
BrE Bradson	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Ch Chatuge	Severe: wetness, floods.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.
DhC Dillard	Moderate: wetness, percs slowly.	Slight	Moderate: slope, wetness, percs slowly.	Slight.
DyC Dyke	Slight	Slight	Severe: slope.	Slight.
DyE Dyke	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
EdE Edneyville	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
EPF*:				
Edneyville	Severe: slope, large stones.	Severe: slope.	Severe: large stones, slope.	Severe: slope, large stones.
Ashe	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
EVF* Evard	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
FaC Fannin	Slight	Slight	Severe: slope.	Slight.
FaE Fannin	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
HaC Hayesville	Slight	Slight	Severe: slope.	Slight.
HaE Hayesville	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
LhE Lily	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
PCF*, PCG* Porters	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 12.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
RaE------------------- Rabun	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
RbF------------------- Rabun	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
RLF*:				
Ramsey---------------	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.
Lily-----------------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rx* Rock outcrop				
SAE*------------------ Saluda	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
SAF*------------------ Saluda	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
SBG*:				
Saluda---------------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Ashe-----------------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
To-------------------- Toccoa	Severe: floods.	Moderate: floods.	Moderate: floods.	Slight.
Tp-------------------- Toxaway	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.
Tr*:				
Transylvania---------	Severe: floods.	Moderate: floods.	Moderate: floods.	Slight.
Toxaway--------------	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.	Severe: wetness, floods.
TuC------------------- Tusquitee	Slight---------------	Slight---------------	Severe: slope.	Slight.
TuE------------------- Tusquitee	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
TVF*:				
Tusquitee------------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Haywood--------------	Severe: slope.	Severe: slope.	Severe: large stones, small stones.	Severe: slope.

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

TABLE 13.--WILDLIFE HABITAT POTENTIALS

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
ACE*:										
Ashe	Poor	Fair	Fair	Poor	Poor	Very poor	Very poor	Fair	Poor	Very poor
Porters	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor
ADG* Ashe	Very poor	Poor	Fair	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor
BrC Bradson	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
BrE Bradson	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor
Ch Chatuge	Poor	Fair	Fair	Good	Good	Good	Fair	Fair	Good	Fair
DhC Dillard	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
DyC Dyke	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
DyE Dyke	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor
EdE Edneyville	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor
EPF*:										
Edneyville	Very poor	Very poor	Fair	Fair	Fair	Very poor	Very poor	Poor	Fair	Very poor
Ashe	Very poor	Poor	Fair	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor
EVF* Evard	Very poor	Very poor	Poor	Good	Good	Very poor	Very poor	Very poor	Good	Very poor
FaC Fannin	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
FaE Fannin	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor
HaC Hayesville	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
HaE Hayesville	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor
LhE Lily	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor
PCF*, PCG* Porters	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor
RaE Rabun	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor

See footnote at end of table.

TABLE 13.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
RbF----------------- Rabun	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor
RLF*:										
Ramsey-------------	Very poor	Poor	Poor	Very poor	Very poor	Very poor	Very poor	Very poor	Poor	Very poor
Lily---------------	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor
Rx*. Rock outcrop										
SAE*, SAF*---------- Saluda	Very poor	Very poor	Poor	Fair	Fair	Very poor	Very poor	Very poor	Fair	Very poor
SBG*:										
Saluda-------------	Very poor	Very poor	Poor	Fair	Fair	Very poor	Very poor	Very poor	Fair	Very poor
Ashe---------------	Very poor	Poor	Fair	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor
To------------------ Toccoa	Poor	Fair	Fair	Good	Good	Poor	Very poor	Fair	Good	Very poor
Tp------------------ Toxaway	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
Tr*:										
Transylvania-------	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
Toxaway------------	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
TuC----------------- Tusquitee	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
TuE----------------- Tusquitee	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor
TVF*:										
Tusquitee----------	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor
Haywood------------	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor

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

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
ACE*:											
Ashe	0-7	Sandy loam	SM, SM-SC, ML, CL-ML	A-4	0-5	90-100	85-100	65-95	40-55	<25	NP-7
	7-24	Loam, sandy loam, fine sandy loam.	SM, SM-SC	A-4	5-15	85-100	80-95	60-95	35-45	<25	NP-7
	24-50	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Porters	0-8	Loam	ML, CL, CL-ML	A-4	0-5	85-100	80-100	65-80	45-65	<30	NP-10
	8-30	Loam, clay loam	ML, SM	A-4, A-7, A-5	5-15	80-95	70-85	60-70	36-55	35-50	4-15
	30-50	Loam, sandy loam	SM, SM-SC	A-2, A-4	5-25	75-99	60-99	50-90	30-50	<25	NP-7
	50-72	Weathered bedrock.	---	---	---	---	---	---	---	---	---
ADG*: Ashe	0-8	Stony sandy loam	SM, SM-SC	A-2, A-4	5-15	80-90	75-90	65-90	30-45	<25	NP-7
	8-28	Loam, sandy loam, fine sandy loam.	SM, SM-SC	A-4	5-15	85-100	80-95	60-95	35-45	<25	NP-7
	28-50	Weathered bedrock.	---	---	---	---	---	---	---	---	---
BrC, BrE: Bradson	0-6	Fine sandy loam	CL, SC, SM, ML	A-4, A-6	0-15	80-100	75-96	60-85	40-65	<40	NP-15
	6-67	Clay loam, sandy clay, clay.	ML, MH	A-7	0-15	85-100	85-100	80-99	60-85	41-65	11-25
	67-90	Loam, sandy clay loam, sandy loam.	ML, CL-ML, CL	A-4	5-30	85-100	80-100	80-98	60-85	<25	NP-10
Ch: Chatuge	0-8	Loam	ML, SM, SC, CL	A-4	0	100	95-100	70-95	40-70	<30	NP-10
	8-48	Loam, clay loam, sandy clay loam.	ML, CL, SM, SC	A-4, A-6	0	100	97-100	75-96	43-75	<35	NP-15
	48-60	Gravelly coarse sand, gravelly loamy sand, very gravelly coarse sand.	SM	A-1	5-15	75-90	40-80	30-50	13-20	---	NP
DhC: Dillard	0-8	Sandy loam	SM, SC, CL, ML	A-2, A-4	0-2	95-100	95-100	60-90	30-55	<35	NP-10
	8-31	Clay loam, sandy clay loam.	CL, ML	A-6, A-7	0-2	95-100	85-100	60-95	50-70	30-45	11-20
	31-55	Clay, clay loam	CL, ML, CH	A-6, A-7	0-2	98-100	95-100	70-95	60-90	36-55	15-30
	55-66	Variable	---	---	---	---	---	---	---	---	---
DyC, DyE: Dyke	0-8	Loam	ML, CL	A-6, A-7	0-5	90-100	75-100	70-100	60-90	35-45	10-20
	8-72	Clay, silty clay, silty clay loam.	MH, CH, ML, CL	A-7	5-15	85-95	75-90	65-85	55-70	42-60	20-30

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
EdE: Edneyville	0-11	Sandy loam	SM, ML, CL, SC	A-2, A-4	0-5	85-100	80-100	70-90	30-55	<30	NP-10
	11-37	Sandy clay loam, loam.	SM, ML, CL, SC	A-4, A-6	0-15	85-100	80-100	80-90	36-60	25-35	6-15
	37-48	Weathered bedrock.	---	---	---	---	---	---	---	---	---
EPF*:											
Edneyville	0-7	Stony sandy loam	CL, SM, CL-ML, SM-SC	A-4	2-15	75-95	70-90	60-85	35-65	<30	NP-10
	7-37	Gravelly sandy clay loam, gravelly loam, gravelly sandy loam.	SM, CL-ML, ML, SM-SC	A-4	0-15	75-100	65-85	45-65	36-65	<25	NP-7
	37-48	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Ashe	0-8	Stony sandy loam	SM, SM-SC	A-2, A-4	5-15	80-90	75-90	65-90	30-45	<25	NP-7
	8-28	Loam, sandy loam, fine sandy loam.	SM, SM-SC	A-4	5-15	85-100	80-95	60-95	35-45	<25	NP-7
	28-50	Weathered bedrock.	---	---	---	---	---	---	---	---	---
EVF*: Evard	0-5	Sandy loam	SM, SM-SC	A-2, A-4	0-5	80-100	75-100	65-90	20-50	<28	NP-7
	5-34	Sandy clay loam, clay loam.	SM, SC, ML, CL	A-2, A-4, A-6	0-2	90-100	85-100	60-95	30-60	25-40	7-14
	34-50	Weathered bedrock.	---	---	---	---	---	---	---	---	---
FaC, FaE: Fannin	0-9	Fine sandy loam	CL, SC	A-4, A-6	5-15	95-100	90-100	60-95	36-85	22-38	8-18
	9-28	Clay loam, sandy clay loam, silty clay loam.	ML, MH	A-4, A-7	2-10	98-100	95-100	85-95	60-85	35-55	9-23
	28-35	Loam	CL, SC	A-4, A-6	5-15	95-100	90-100	70-90	45-80	25-38	8-18
	35-72	Weathered bedrock.	---	---	---	---	---	---	---	---	---
HaC, HaE: Hayesville	0-8	Fine sandy loam	SM, SC, ML, CL	A-4	0	90-100	85-95	70-95	35-60	<25	NP-10
	8-47	Clay loam, clay	ML, MH, CL, CH	A-6, A-7	0	90-100	85-100	70-100	55-75	36-55	11-25
	47-55	Sandy clay loam, clay loam.	SM, ML, MH, CL	A-6, A-7	0-5	90-100	90-100	85-95	45-65	36-55	11-25
	55-72	Fine sandy loam	SM, ML, CL, SC	A-4, A-6	5-15	90-100	90-95	75-90	40-55	<28	NP-12
LhE: Lily	0-5	Fine sandy loam	SM	A-4, A-2	0-5	90-100	85-100	55-80	25-50	<20	NP-4
	5-28	Clay loam, sandy clay loam, loam.	SM, SC, ML, CL	A-4, A-6	0-5	90-100	85-100	75-100	40-80	<35	3-15
	28-39	Sandy clay loam, loamy sand, gravelly sandy clay loam.	SM, SC, ML, CL	A-4, A-2, A-6	0-10	65-100	50-100	40-95	20-75	<35	3-15
	39	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
PCF*, PCG*: Porters	0-7	Stony loam	ML, SM,	A-2, A-4	5-25	75-95	70-85	50-70	30-45	<30	NP-10
	7-25	Loam, clay loam	ML, SM	A-4, A-7, A-5	5-15	80-95	70-85	60-70	36-55	35-50	4-15
	25-40	Weathered bedrock.	---	---	---	---	---	---	---	---	---
	40-72	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
RaE: Rabun	0-9	Loam	ML, CL, SM, SC	A-6, A-7, A-4	0-2	90-100	75-100	70-100	45-70	25-45	6-20
	9-37	Clay loam, clay, silty clay.	ML, CL, MH, CH	A-7	0-5	90-100	80-100	65-96	55-90	41-61	12-30
	37-62	Weathered bedrock.	---	---	---	---	---	---	---	---	---
RbF: Rabun	0-9	Stony loam	SM-SC, SM, SC	A-4, A-6	15-25	75-95	55-85	50-80	35-50	20-35	4-12
	9-27	Clay loam, clay	ML, CL, MH, CH	A-7	0-5	90-100	80-100	65-96	55-86	41-61	12-30
	27-37	Clay, cobbly loam, stony clay loam.	ML, CL, MH, CH	A-6, A-7	5-20	80-95	70-90	55-85	51-80	35-60	11-28
	37-62	Weathered bedrock.	---	---	---	---	---	---	---	---	---
RLF*: Ramsey	0-17	Stony sandy loam	SM, CL-ML, ML, CL	A-4, A-2	15-30	75-90	65-85	50-75	35-65	15-25	2-8
	17	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Lily	0-5	Fine sandy loam	SM	A-4, A-2	0-5	90-100	85-100	55-80	25-50	<20	NP-4
	5-28	Clay loam, sandy clay loam, loam.	SM, SC, ML, CL	A-4, A-6	0-5	90-100	85-100	75-100	40-80	<35	3-15
	28-39	Sandy clay loam, loamy sand, gravelly sandy clay loam.	SM, SC, ML, CL	A-4, A-2, A-6	0-10	65-100	50-100	40-95	20-75	<35	3-15
	39-60	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rx*. Rock outcrop											
SAE*, SAF*: Saluda	0-5	Fine sandy loam	SM, SM-SC	A-2, A-4	0-3	90-100	85-98	60-70	25-45	<30	NP-7
	5-16	Sandy loam, sandy clay loam, clay loam.	SM, SM-SC, SC	A-2, A-4, A-6	0-2	90-100	85-98	60-85	30-50	20-38	3-15
	16-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---
SBG*: Saluda	0-5	Stony fine sandy loam.	SM	A-2	5-15	65-85	60-80	55-75	15-35	<30	NP-4
	5-16	Sandy loam, sandy clay loam, clay loam.	SM, SM-SC, SC	A-2, A-4, A-6	0-2	90-100	85-98	60-85	30-50	20-38	3-15
	16-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification Unified	Classification AASHTO	Frag- ments > 3 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
Ashe	0-8	Stony sandy loam	SM, SM-SC	A-2, A-4	5-15	80-90	75-90	65-90	30-45	<25	NP-7
	8-28	Loam, fine sandy loam.	SM, SM-SC	A-4	5-15	85-100	80-95	60-95	35-45	<25	NP-7
	28-50	Weathered bedrock.	---	---	---	---	---	---	---	---	---
To Toccoa	0-8	Fine sandy loam	SM, ML	A-2, A-4	0	98-100	95-100	85-100	25-60	<30	NP-4
	8-62	Sandy loam, loam	SM, ML	A-2, A-4	0	95-100	90-100	60-100	30-55	<30	NP-4
Tp Toxaway	0-37	Silt loam	CL	A-4, A-7	0	98-100	95-100	85-100	51-90	25-46	8-22
	37-60	Stratified sandy clay loam to sand.	CL, ML, SM, SC	A-2, A-4, A-6	5-15	95-100	85-100	60-95	25-90	<30	NP-15
Tr*:											
Transylvania	0-25	Silt loam	ML, MH	A-4, A-6, A-7	0	100	90-100	80-100	60-95	30-55	7-20
	25-46	Silty clay loam, silt loam, loam.	ML, MH	A-4, A-6, A-7	0	100	90-100	85-100	60-95	30-55	7-20
	46-62	Variable	---	---	---	---	---	---	---	---	---
Toxaway	0-37	Silt loam	CL	A-4, A-7	0	98-100	95-100	85-100	51-90	25-46	8-22
	37-60	Stratified sandy clay loam to sand.	CL, ML, SM, SC	A-2, A-4, A-6	5-15	95-100	85-100	60-95	25-90	<30	NP-15
TuC, TuE Tusquitee	0-11	Loam	ML, MH, SM	A-5, A-7	2-10	90-100	80-100	65-95	40-75	40-55	5-15
	11-60	Clay loam, sandy clay loam, loam.	ML, CL-ML, SM-SC	A-4, A-6	2-15	90-100	75-100	65-95	36-75	25-40	4-12
TVF*:											
Tusquitee	0-11	Stony loam	ML, MH, SM	A-5, A-7	2-10	90-100	80-100	65-95	40-75	40-55	5-15
	11-60	Clay loam, sandy clay loam, loam.	ML, CL-ML, SM-SC	A-4, A-6	2-15	90-100	75-100	65-95	36-75	25-40	4-12
Haywood	0-66	Stony fine sandy loam.	SM, ML, CL-ML, SM-SC	A-2-4, A-4	15-30	85-95	75-95	45-80	30-55	<20	NP-7

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

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[Entries under "Erosion factors--T" apply to the entire profile. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T
	In	In/hr	In/in	pH			
ACE*:							
Ashe	0-7	2.0-6.0	0.13-0.18	4.5-5.5	Low	0.17	2
	7-24	2.0-6.0	0.10-0.14	4.5-5.5	Low	0.17	
	24-50	---	---	---	---	---	
Porters	0-8	0.6-2.0	0.16-0.20	4.5-6.0	Low	0.24	4
	8-30	0.6-2.0	0.16-0.25	4.5-6.0	Low	0.24	
	30-50	2.0-6.0	0.10-0.20	4.5-6.0	Low	0.24	
	50-72	---	---	---	---	---	
ADG* Ashe	0-8	2.0-6.0	0.10-0.13	4.5-5.5	Low	0.17	2
	8-28	2.0-6.0	0.10-0.14	4.5-5.5	Low	0.17	
	28-50	---	---	---	---	---	
BrC, BrE Bradson	0-6	0.6-2.0	0.12-0.18	4.5-6.0	Low	0.17	4
	6-67	0.6-2.0	0.12-0.18	4.5-5.5	Low	0.24	
	67-90	0.6-2.0	0.12-0.18	4.5-5.5	Low	0.32	
Ch Chatuge	0-8	0.6-2.0	0.12-0.20	4.5-6.0	Low	0.32	4
	8-48	0.6-2.0	0.15-0.20	4.5-6.0	Moderate	0.32	
	48-60	6.0-20	0.03-0.10	4.5-6.0	Low	0.28	
DhC Dillard	0-8	0.6-2.0	0.12-0.15	5.1-6.0	Low	0.32	4
	8-31	0.6-2.0	0.12-0.16	4.5-5.5	Low	0.28	
	31-55	0.2-0.6	0.14-0.18	4.5-5.5	Moderate	0.28	
	55-66	---	---	---	---	---	
DyC, DyE Dyke	0-8	0.6-6.0	0.17-0.22	4.5-5.5	Low	0.37	4
	8-72	0.6-2.0	0.14-0.19	4.5-5.5	Moderate	0.28	
EdE Edneyville	0-11	2.0-6.0	0.11-0.17	4.5-5.5	Low	0.17	3
	11-37	0.6-2.0	0.14-0.16	4.5-5.0	Low	0.20	
	37-48	---	---	---	---	---	
EPF*:							
Edneyville	0-7	2.0-6.0	0.10-0.15	4.5-5.5	Low	0.17	3
	7-37	0.6-2.0	0.12-0.16	4.5-5.5	Low	0.20	
	37-48	---	---	---	---	---	
Ashe	0-8	2.0-6.0	0.13-0.18	4.5-5.5	Low	0.17	2
	8-28	2.0-6.0	0.10-0.14	4.5-5.5	Low	0.17	
	28-50	---	---	---	---	---	
EVF* Evard	0-5	2.0-6.0	0.10-0.14	4.5-5.5	Low	0.20	4
	5-34	0.6-2.0	0.12-0.16	4.5-5.5	Low	0.24	
	34-50	---	---	---	---	---	
FaC, FaE Fannin	0-9	2.0-6.0	0.10-0.16	4.5-5.5	Low	0.28	3
	9-28	0.6-2.0	0.11-0.17	4.5-5.5	Low	0.32	
	28-35	0.6-2.0	0.10-0.15	4.5-5.5	Low	---	
	35-72	---	---	---	---	---	
HaC, HaE Hayesville	0-8	2.0-6.0	0.12-0.20	4.5-5.5	Low	0.20	4
	8-47	0.6-2.0	0.15-0.20	4.5-5.5	Low	0.24	
	47-55	0.6-2.0	0.12-0.20	4.5-5.5	Low	---	
	55-72	2.0-6.0	0.11-0.15	4.5-5.5	Low	---	
LhE Lily	0-5	2.0-6.0	0.09-0.16	3.6-5.5	Low	0.28	3
	5-28	2.0-6.0	0.12-0.18	3.6-5.5	Low	0.28	
	28-39	2.0-6.0	0.08-0.17	3.6-5.5	Low	0.17	
	39	---	---	---	---	---	

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors	
						K	T
	In	In/hr	In/in	pH			
PCF*, PCG*: Porters	0-7	0.6-2.0	0.16-0.20	4.5-6.0	Low	0.24	4
	7-25	0.6-2.0	0.16-0.25	4.5-6.0	Low	0.24	
	25-40	---	---	---	---	---	
	40-72	---	---	---	---	---	
RaE: Rabun	0-9	0.6-2.0	0.12-0.18	5.1-6.5	Low	0.32	4
	9-37	0.6-2.0	0.12-0.18	5.1-6.5	Low	0.28	
	37-62	---	---	---	---	---	
RbF: Rabun	0-9	0.6-2.0	0.10-0.15	5.1-6.5	Low	0.28	4
	9-27	0.6-2.0	0.12-0.18	5.1-6.5	Low	0.28	
	27-37	0.6-2.0	0.06-0.12	5.1-6.5	Low	0.28	
	37-62	---	---	---	---	---	
RLF*:							
Ramsey	0-17	6.0-20	0.06-0.10	4.5-5.5	Low	0.17	1
	17	---	---	---	---	---	
Lily	0-5	2.0-6.0	0.09-0.16	3.6-5.5	Low	0.28	3
	5-28	2.0-6.0	0.12-0.18	3.6-5.5	Low	0.28	
	28-39	2.0-6.0	0.08-0.17	3.6-5.5	Low	0.17	
	39-60	---	---	---	---	---	
Rx*. Rock outcrop							
SAE*, SAF*: Saluda	0-5	2.0-6.0	0.10-0.14	4.5-5.5	Low	0.20	2
	5-16	0.6-2.0	0.12-0.16	4.5-5.5	Low	0.20	
	16-60	---	---	---	---	---	
SBG*:							
Saluda	0-5	2.0-6.0	0.08-0.12	4.5-5.5	Low	0.20	2
	5-16	0.6-2.0	0.12-0.16	4.5-5.5	Low	0.20	
	16-60	---	---	---	---	---	
Ashe	0-8	2.0-6.0	0.10-0.13	4.5-5.5	Low	0.17	2
	8-28	2.0-6.0	0.10-0.14	4.5-5.5	Low	0.17	
	28-50	---	---	---	---	---	
To: Toccoa	0-8	2.0-6.0	0.09-0.12	5.1-6.5	Low	0.10	4
	8-62	2.0-6.0	0.06-0.12	5.1-6.5	Low	0.10	
Tp: Toxaway	0-37	0.6-2.0	0.15-0.20	5.1-6.0	Low	0.17	---
	37-60	2.0-20	0.05-0.15	5.1-6.0	Low	---	
Tr*:							
Transylvania	0-25	0.6-2.0	0.16-0.24	4.5-6.0	Low	0.32	5
	25-46	0.6-2.0	0.15-0.20	4.5-6.0	Low	0.32	
	46-62	---	---	---	---	---	
Toxaway	0-37	0.6-2.0	0.15-0.20	5.1-6.0	Low	0.17	---
	37-60	2.0-20	0.05-0.15	5.1-6.0	Low	---	
TuC, TuE: Tusquitee	0-11	2.0-6.0	0.11-0.22	5.1-6.0	Low	0.17	4
	11-60	0.6-2.0	0.15-0.21	5.1-6.0	Low	0.20	
TVF*:							
Tusquitee	0-11	2.0-6.0	0.11-0.22	5.1-6.0	Low	0.17	4
	11-60	0.6-2.0	0.15-0.21	5.1-6.0	Low	0.20	
Haywood	0-66	6.0-20	0.10-0.15	5.1-6.5	Low	0.15	4

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

TABLE 16.--SOIL AND WATER FEATURES

[The definitions of "flooding" and "water table" in the glossary explain terms such as "rare," "brief," and "perched." The symbol < means less than; > means greater than. Absence of an entry indicates that the feature is not a concern]

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hard-ness	Uncoated steel	Concrete
					Ft			In			
ACE*:											
Ashe	B	None	---	---	>6.0	---	---	20-40	Rip-pable	Low	High.
Porters	B	None	---	---	>6.0	---	---	40-72	Hard	Low	High.
ADG* Ashe	B	None	---	---	>6.0	---	---	20-40	Rip-pable	Low	High.
BrC, BrE Bradson	B	None	---	---	>6.0	---	---	>60	---	High	Moderate.
Ch Chatuge	D	Occasional	Very brief	Dec-Apr	1.0-2.0	Apparent	Dec-May	>60	---	High	High.
DhC Dillard	C	None	---	---	2.0-3.0	Apparent	Dec-Apr	>60	---	Moderate	High.
DyC, DyE Dyke	B	None	---	---	>6.0	---	---	>60	Hard	High	Moderate.
EdE Edneyville	B	None	---	---	>6.0	---	---	>40	Rip-pable	Low	High.
EPF*:											
Edneyville	B	None	---	---	>6.0	---	---	>40	Rip-pable	Low	High.
Ashe	B	None	---	---	>6.0	---	---	20-40	Rip-pable	Low	High.
EVF* Evard	B	None	---	---	>6.0	---	---	>60	---	Moderate	High.
FaC, FaE Fannin	B	None	---	---	>6.0	---	---	20-40	Rip-pable	Low	High.
HaC, HaE Hayesville	B	None	---	---	>6.0	---	---	>60	Rip-pable	Moderate	Moderate.
LhE Lily	B	None	---	---	>6.0	---	---	20-40	Hard	Moderate	High.
PCF*, PCG* Porters	B	None	---	---	>6.0	---	---	40-72	Hard	Low	High.
RaE, RbF Rabun	B	None	---	---	>6.0	---	---	>60	---	High	Moderate.
RLF*:											
Ramsey	D	None	---	---	>6.0	---	---	7-20	Hard	Low	Moderate.
Lily	B	None	---	---	>6.0	---	---	20-40	Hard	Moderate	High.
Rx*. Rock outcrop											
SAE*, SAF* Saluda	C	None	---	---	>6.0	---	---	>60	---	Moderate	High.

See footnote at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hard-ness	Uncoated steel	Concrete
					Ft			In			
SBG*:											
Saluda	C	None	---	---	>6.0	---	---	>60	---	Moderate	High.
Ashe	B	None	---	---	>6.0	---	---	20-40	Rip-pable	Low	High.
To Toccoa	B	Common	Brief	Jan-Dec	2.5-5.0	Apparent	Dec-Apr	>60	---	Low	Moderate.
Tp Toxaway	D	Frequent	Very brief	Nov-Mar	0-1.0	Apparent	Nov-Apr	>60	---	High	Moderate.
Tr*:											
Transylvania	B	Frequent	Brief	Jan-Dec	2.5-3.5	Apparent	Dec-Apr	>60	---	High	High.
Toxaway	D	Frequent	Very brief	Nov-Mar	0-1.0	Apparent	Nov-Apr	>60	---	High	Moderate.
TuC, TuE Tusquitee	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
TVF*:											
Tusquitee	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
Haywood	B	None	---	---	>6.0	---	---	>60	---	Low	Moderate.

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

TABLE 17.--ENGINEERING TEST DATA

[Dashes indicate data were not available. NP means nonplastic]

Soil name, report number, horizon, and depth in inches	Classification		Grain size distribution							Liquid limit	Plasticity index	Moisture density		Percentage volume change		
			Percentage passing sieve				Percentage smaller than--									
	AASHTO	Unified	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm			Max. dry density	Optimum moisture	Total	Swell	Shrink
										Pct		Lb/ft^3	Pct	Pct	Pct	Pct
Bradson sandy loam:[1] (S74GA-241-007)																
Ap------ 0 to 6	A-4 (00)	SM	100	96	85	48	36	23	17	--	NP	97	22	11.1	6.5	4.6
B21t---- 10 to 23	A-7-6(10)	ML	100	97	85	65	56	45	37	45	17	98	21	9.7	2.3	7.4
B22t---- 23 to 52	A-7-5(15)	MH	100	97	86	68	62	55	50	55	22	94	23	7.4	2.0	5.4
Chatuge loam:[2] (S75GA-281-006)																
Ap------ 0 to 8	A-4 (00)	ML	100	95	89	68	49	24	13	--	NP	88	30	24.4	14.8	9.6
B21tg--- 17 to 33	A-4 (00)	ML	100	98	86	73	62	38	27	--	NP	98	23	24.7	20.6	4.1
B22tg--- 33 to 41	A-4 (00)	ML	100	98	96	75	60	40	29	--	NP	98	20	26.2	16.6	9.6
Dillard sandy loam:[3] (S75GA-241-003)																
Ap------ 0 to 8	A-4 (01)	SM	100	98	77	42	30	14	8	33	9	101	20	20.8	17.6	3.2
B21t---- 8 to 20	A-6 (06)	CL	100	98	76	53	50	41	34	38	17	106	17	7.4	3.3	4.1
IIB24tg- 31 to 37	A-7-6(12)	ML	100	97	86	70	66	56	46	44	17	99	20	18.1	7.5	0.6
Dyke loam:[4] (S74GA-241-005)																
B21t---- 13 to 24	A-6 (17)	CL	100	97	87	74	67	46	34	38	27	98	21	11.5	3.8	7.7
B22t---- 24 to 47	A-6 (10)	ML	100	99	90	76	69	50	37	40	13	99	20	11.4	3.9	7.5
IIB23t-- 47 to 60	A-6 (13)	CL	100	99	89	75	67	47	37	39	18	101	20	14.7	7.0	7.7
Edneyville sandy loam:[5] (S75GA-241-001)																
A1------ 0 to 7	A-4 (00)	SM	100	97	79	42	33	21	14	--	NP	90	25	17.4	11.7	5.7
B2t----- 12 to 23	A-6 (03)	SM	100	97	71	46	44	31	24	40	12	98	17	13.2	10.2	3.0
B3------ 23 to 31	A-4 (01)	SM	100	97	67	39	34	26	21	38	10	99	16	11.0	7.5	3.5
Rabun loam:[6] (S75GA-281-004)																
A11----- 0 to 2	A-4 (00)	ML	100	98	87	63	39	19	13	--	NP	87	27	16.9	11.1	5.8
B2t----- 14 to 37	A-7-5(19)	MH	100	97	89	81	75	62	56	53	21	90	25	20.6	4.6	6.0
B3------ 37 to 48	A-7-6(11)	ML	100	97	84	70	62	48	41	43	16	96	22	13.9	4.9	9.0

See footnotes at end of table.

TABLE 17.--ENGINEERING TEST DATA--Continued

Soil name, report number, horizon, and depth in inches	Classification		Grain size distribution							Liquid limit	Plasticity index	Moisture density		Percentage volume change		
			Percentage passing sieve				Percentage smaller than--									
	AASHTO	Unified	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm			Max. dry density	Optimum moisture	Total	Swell	Shrink
										Pct		Lb/ft3	Pct	Pct	Pct	Pct
Saluda sandy loam:[7] (S74GA-241-011)																
A2------ 1 to 5	A-2-4(00)	SM	100	96	76	33	27	18	14	--	NP	100	16	9.5	7.8	1.7
B2t----- 5 to 15	A-6 (04)	SC	100	97	85	48	43	35	32	35	14	100	16	14.0	9.3	4.7
Cr------ 15 to 60	A-2-4(00)	SM	100	98	91	33	28	24	22	--	NP	94	21	16.5	13.0	3.5

[1]Bradson sandy loam: 5.9 miles east of Clayton on U.S. Highway 76, 2.2 miles northeast on Pole Creek Road, north of road in wooded area.

[2]Chatuge loam: 7.9 miles west of Hiawassee and 0.5 mile north of Young Harris on U.S. Highway 76, 300 feet west of highway, 150 feet north of Corn Creek.

[3]Dillard sandy loam: 6 miles north of Clayton on U.S. Highway 441, 0.4 mile west of Rabun Gap Post Office on paved road, 50 feet north of road.

[4]Dyke loam: 1.7 miles north of highway junction of U.S. Highway 76 and State Route 197 on Popcorn Creek Road, north side of road.

[5]Edneyville sandy loam: 3.3 miles north of Clayton on U.S. Highway 441, 2.6 miles west on paved road, 0.8 mile southeast on gravel road, south side of road in woods.

[6]Rabun loam: 7.9 miles west of Hiawassee, 0.5 mile north of Young Harris on U.S. Highway 76, 1.2 miles east of highway, southeast side of road.

[7]Saluda sandy loam: 8.8 miles west of Clayton on U.S. Highway 76, 1.1 miles south on Acron Road, in wooded area.

TABLE 18.--CLASSIFICATION OF THE SOILS

[An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series]

Soil name	Family or higher taxonomic class
Ashe	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Bradson	Clayey, oxidic, mesic Typic Hapludults
Chatuge	Fine-loamy, mixed, mesic Typic Ochraquults
Dillard	Fine-loamy, mixed, mesic Aquic Hapludults
Dyke	Clayey, mixed, mesic Typic Rhodudults
Edneyville	Fine-loamy, mixed, mesic Typic Hapludults
Evard	Fine-loamy, oxidic, mesic Typic Hapludults
Fannin	Fine-loamy, micaceous, mesic Typic Hapludults
Hayesville	Clayey, oxidic, mesic Typic Hapludults
Haywood	Coarse-loamy, mixed, mesic Cumulic Haplumbrepts
Lily	Fine-loamy, siliceous, mesic Typic Hapludults
Porters	Fine-loamy, mixed, mesic Humic Hapludults
Rabun	Clayey, kaolinitic, mesic Typic Rhodudults
Ramsey	Loamy, siliceous, mesic Lithic Dystrochrepts
Saluda	Loamy, mixed, mesic, shallow Typic Hapludults
*Toccoa	Coarse-loamy, mixed, nonacid, thermic Typic Udifluvents
Toxaway	Fine-loamy, mixed, nonacid, mesic Cumulic Humaquepts
*Transylvania	Fine-loamy, mixed, mesic Cumulic Haplumbrepts
Tusquitee	Fine-loamy, mixed, mesic Humic Hapludults

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