United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with United States Department of Agriculture, Forest Service; United States Department of the Interior, Bureau of Indian Affairs; Eastern Band of the Cherokee Nation; North Carolina Department of Environment and Natural Resources; North Carolina Agricultural Research Service; North Carolina Cooperative Extension Service; Graham Soil and Water Conservation District; and Graham County Board of Commissioners

Soil Survey of Graham County, North Carolina

How To Use This Soil Survey

General Soil Map

The general soil map, which is a color map, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

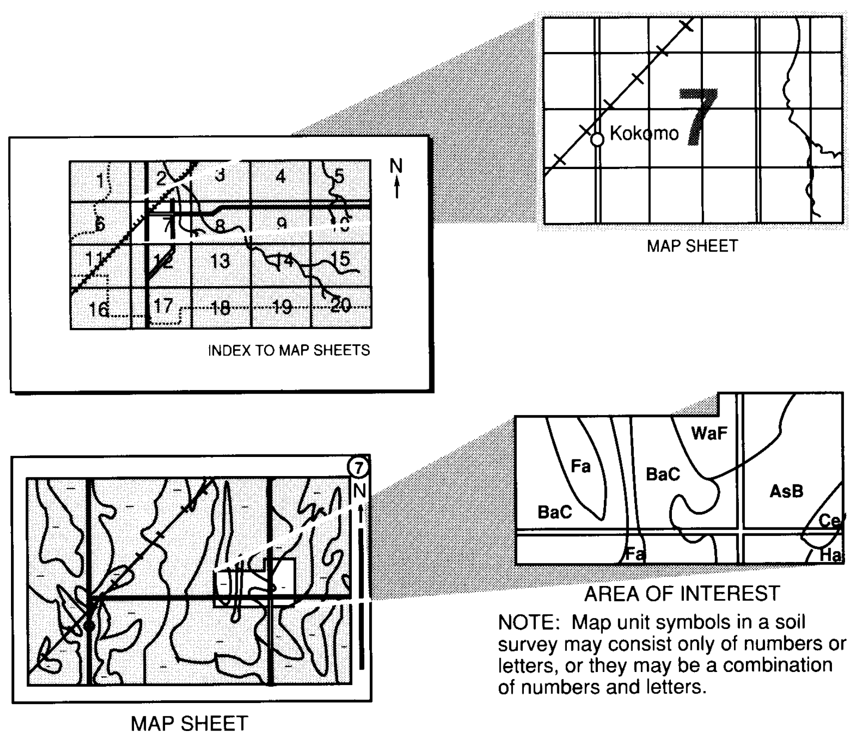
Detailed Soil Maps

The detailed soil maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**. Note the number of the map sheet and turn to that sheet.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.



NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 2002. Soil names and descriptions were approved in 2006. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 2006. This survey was made cooperatively by the Natural Resources Conservation Service; the United States Department of Agriculture, Forest Service; the United States Department of the Interior, Bureau of Indian Affairs; the Eastern Band of the Cherokee Nation; the North Carolina Department of Environment and Natural Resources; the North Carolina Agricultural Research Service; the North Carolina Cooperative Extension Service; the Graham Soil and Water Conservation District; and the Graham County Board of Commissioners. The survey is part of the technical assistance furnished to the Graham Soil and Water Conservation District. The Graham County Board of Commissioners provided financial assistance for the survey.

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

Cover: Stecoah Valley from Cheoah Bald in the high mountains in the Breakneck-Pullback-Luftee-Anakeesta general soil map unit. Intermediate mountains (foreground) and Hogback Mountain (center) are in the Sylco-Cataska-Spivey-Santeetlah general soil map unit. The Cheoah Mountains (middle ground, to the left) are in the Soco-Stecoah-Cheoah-Spivey general soil map unit. The Great Smoky Mountains (background) are north of Fontana Lake.

Contents

Issued 2011

Foreword

Soil surveys contain information that affects land use planning in survey areas. They include predictions of soil behavior for selected land uses. The surveys highlight soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

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

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://soils.usda.gov/sqi/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS state soil scientist (http://soils.usda.gov/contact/state_offices/).

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

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

J.B. Martin
State Conservationist
Natural Resources Conservation Service

Soil Survey of Graham County, North Carolina

By Brian Wood and Southern Blue Ridge Soil Survey Office, Natural Resources Conservation Service

Soils surveyed by Brian Wood, Natural Resources Conservation Service, and Chris Fabian and Michael Henderson, North Carolina Department of Environment and Natural Resources

United States Department of Agriculture, Natural Resources Conservation Service,
in cooperation with
United States Department of Agriculture, Forest Service; United States Department of the Interior, Bureau of Indian Affairs; Eastern Band of the Cherokee Nation; North Carolina Department of Environment and Natural Resources; North Carolina Agricultural Research Service; North Carolina Cooperative Extension Service; Graham Soil and Water Conservation District; and Graham County Board of Commissioners

Graham County is located in the southwestern mountains of western North Carolina, about 341 miles west of Raleigh, the State capital (fig. 1). It consists of 193,017 acres, or approximately 302 square miles, of which 96 percent is land and 4 percent, or about 13 square miles, is water. Topography includes very steep mountains, rolling intermountain hills, and narrow valleys. Elevation ranges from 1,086 feet above sea level on the Little Tennessee River, at the Tennessee State line, to 5,560 feet on Huckleberry Knob.

The county is in the Great Smoky Mountains of the Southern Blue Ridge Mountain Physiographic Province (MLRA 130B). It is bounded to the east and north by Swain County, North Carolina, to the south by Cherokee and Macon Counties, North Carolina, and to the west by Monroe and Blount Counties, Tennessee. In 2000, according to the U.S. Census Bureau, the county had a population of 7,993. The estimated 2010 population is 8,248. In 2000, Robbinsville, the county seat, had a population of 747.

This soil survey updates the survey of Graham County published in July 1953 (USDA-BPI, 1953). It provides additional information and has larger maps, which show the soils in greater detail.

General Nature of the Survey Area

This section gives general information about Graham County. It describes history and development; economic development; physiography, relief, and drainage; and climate.

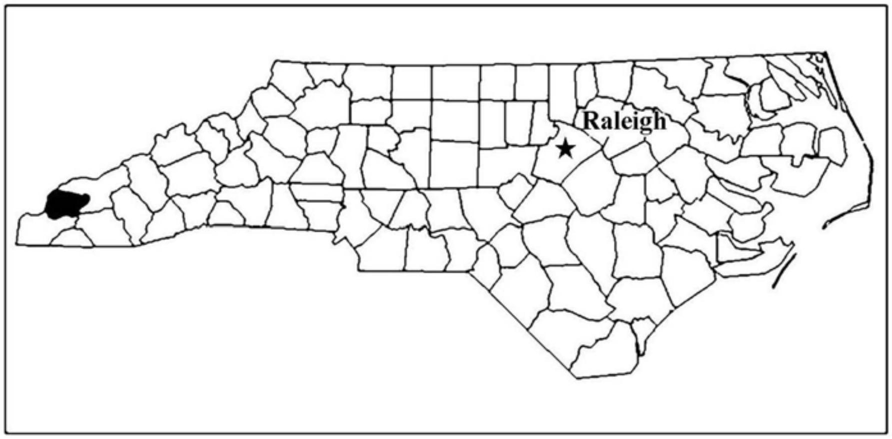


Figure 1.—Location of Graham County in North Carolina.

History and Development

The Graham County Chamber of Commerce, the Graham County Historical Society, Graham County Travel and Tourism, the Eastern Band of the Cherokee Nation, and the Tennessee Valley Authority helped prepare this section.

The survey area, which is part of the Little Tennessee River Valley, is home to the Cherokee. The Snowbird Band of the Cherokee live on tribal lands in Graham County. The Cherokee enjoy a settled, sophisticated, agrarian lifestyle.

European settlers arrived in western North Carolina in the late 18th century but, due to rugged terrain and the remote location, the survey area was the last area of the State to be settled. Most of the pioneers were Scots-Irish and English. Initially, the Cherokee were friendly and only fought with settlers when provoked. The Cherokee Nation attempted to make treaties and to adapt to European customs. They adopted a written legal code in 1808 and instituted a supreme court 2 years later. Sequoyah, a Cherokee silversmith, created an alphabet for the Cherokee language. In the space of 2 years, nearly all of the Cherokee could read and write the language.

In 1828, the discovery of gold in nearby northern Georgia sounded the death knell for the Cherokee Nation. In 1830, President Andrew Jackson signed the Removal Act, calling for the relocation of all native peoples east of the Mississippi River to the Oklahoma Territory. The Cherokee appealed their case to the U.S. Supreme Court, and Chief Justice Marshall ruled in their favor. President Jackson, however, disregarded the Supreme Court decree in the one instance in American history when a U.S. president overtly ignored a Supreme Court decision.

In 1838, the U.S. government forced some 17,000 Cherokee to march to Oklahoma along what has become known as the Trail of Tears. About one-third of the Cherokee died en route of malnutrition and disease. Altogether, about 100,000 Cherokee, Seminole, Chickasaw, and Choctaw survived the journey. A handful of Cherokee disobeyed the government edict and managed to survive by hiding out in the rugged mountains. In 1889, the 56,000-acre Qualla Boundary, known today as the Eastern Band of the Cherokee Nation, was chartered with a population of about 1,000. Approximately 10,500 of their descendants currently live on tribal lands along the southern boundary of the Great Smoky Mountains National Park and in parts of Graham County and neighboring Cherokee and Swain Counties.

European settlements began soon after the Cherokee Nation surrendered land in a treaty in 1819. The Europeans settled in the areas along the Little Tennessee, Cheoah, and Santeetlah Rivers. Like the Cherokee, pioneers who settled in the Smokies in the 18th and 19th centuries preferred the fertile valleys, but land soon became scarce and latter arrivals made their homesteads along steep slopes. Due to the rugged mountains and lack of roads, the early settlers lived in virtual isolation. The area remained relatively inaccessible until well after the Civil War and the arrival of the railroad.

In 1872, Graham County was established from the northeastern part of Cherokee County. The county is named in honor of William A. Graham, a senator for North Carolina from 1840 to 1843 and Governor of North Carolina from 1845 to 1849. In 1883, Robbinsville was incorporated and became the county seat. It is the largest community in the county. Most claim Robbinsville was named after Senator James L. Robinson of Macon County, North Carolina; some believe it was named after Mr. Robbins of Clay County, North Carolina, who taught at the first school in Graham County.

Until the railway penetrated the valley, Graham County was mostly inaccessible to the rest of the world. Once completed, the railroad brought a flood of salesmen peddling their modern conveniences and luxuries from the northern factories. Railroads changed the way of life for residents of western North Carolina. They provided greater ease of transportation to and from the previously remote area, opened up new opportunities, and ushered in a prosperous period for the region.

The first railroad, a narrow-gauge, was built by the Kanawha Hardwood Lumber Company from Andrews to Little Snowbird and started operation around 1907. In 1923 and 1924, substantial acreages of timberland, comprising the watersheds of Little Snowbird, Big Snowbird, West Buffalo, and Santeetlah Creeks, were purchased by several lumber companies. The Bemis Lumber Company started construction of a railroad from Topton to Robbinsville. The arrival of the first train in Robbinsville was in late 1925. The company continued to haul freight until late 1970.

In the 1920s, many roads were built through the mountains to link towns together. It was not until 1931, however, that an automobile would cross Deal's Gap in Graham County. From 1916 until then, transportation was by rail. By the late 1940s, passenger train traffic began to decline and was then discontinued. The opening of roads was a tremendous step forward. It permitted travel to Knoxville and eastern Tennessee and gave Graham County a new market place. Most important of all was the resulting tourist industry. This industry became more important in 1945, when the Tennessee Valley Authority completed Fontana Reservoir, creating the largest lake in the mountains. The old dam construction village, erected for workmen, which at one time numbered as many as 5,000, was converted into North Carolina's largest single resort enterprise, Fontana Village.

Tourism played a significant role in the history and development of Graham County. The Great Smoky Mountains National Park, located just north of Fontana Lake's shoreline, was chartered by Congress in 1934. It is the most visited national park in the United States. During the Great Depression, the Civilian Conservations Corps and Works Progress Administration provided much of the manpower to build necessary park infrastructure. The Cherohala Skyway near Robbinsville was once a Native American trading route and wagon train road for early settlers and is now one of the newest scenic roads in the United States.

Graham County has three large lakes: Cheoah, Fontana, and Santeetlah Lakes. Each lake offers a multitude of recreational activities. The Tennessee Valley Authority System's Fontana Dam was finished in 1944. At an elevation of 480 feet, it is the tallest dam east of the Rocky Mountains. Dams and lakes in the Tennessee Valley Authority System serve several purposes, chiefly providing flood regulation and a water storage facility that supports hydroelectric generation (fig. 2).

Like most of western North Carolina, the population of Graham County declined after the Great Depression and World War II. The county has had slight growth from the 1970s until now. Several factors have contributed to this growth. Economic opportunities in the form of providing goods and services in support of the tourist

Figure 2.—Cheoah Dam (top) and Fontana Dam (bottom) were constructed for the production of electricity, flood control, improved navigation downstream, and recreation.

industry have reduced out-migration by the local population. Construction has also provided a number of jobs. Graham County offers a rural, small town setting. Entrepreneurs are interested in starting small businesses in the area, and many retirees who built summer homes in the area are permanently settling here.

Economic Development

Initially, Graham County had a subsistence-based agricultural economy. Toward the end of the 19th century, the railroad opened up the area to large-scale timber operations and a few small mining operations. Technological advances contributed to the cost-effective removal of timber, and the need of the eastern United States for lumber nearly eliminated all the southern Appalachian forests. Railroads were the key to the companies' massive logging operations. Company logging towns and sawmills were constructed to expedite the harvesting and removal of timber. Mountain people who had once plowed fields and raised livestock abandoned their farms and began to harvest timber and saw logs for a living. They were attracted to logging by the promise of security and the stability of a steady paycheck. Their security, however, was short-lived.

By the late 1920s and early 1930s, most of the marketable timber was cut and disease had destroyed the American chestnut. This closed out the era of the timber baron and the lumber business as a major industry. Having logged all but the most inaccessible areas, lumber companies were casting their sights westward. Timber was vital to the local economy and had radically changed the land and the life of the people. Some of the mountain people returned to farming while others left the area seeking jobs in mines, textile mills, and automobile factories.

Today, the county's economy is a mix of tourism, agriculture, wood products, and light industry. Approximately 177,852 acres, or 92 percent of the county, is in forestland. Forest products are an important industry, but only 164,174 acres, or 85 percent of the county, is available for timber production. The growing conditions in the county are conducive to the production of quality hardwoods, which are important to the local economy.

In 2008, according to the Graham Chamber of Commerce and North Carolina Agricultural Statistics, income from all forest products was $1,426,000. In 2000, approximately 21 percent of the work force was in manufacturing, 20 percent in educational and health services, 18.5 percent in construction, 4.5 percent in agriculture, forestry, and mining, 3 percent in transportation and utilities, and 33 percent in other services, dominantly in retail, tourism, and administration.

In 2007, according to the North Carolina Department of Agriculture and the Department of Agriculture's National Agricultural Statistics (USDA Publication no. 211), the county had 126 farms covering 7,182 acres. There were approximately 438 acres of cropland with 141 acres of harvested cropland. In 2009, cash receipts totaled $2,657,090. The major agricultural products are hay, beef cattle, goats, and specialty crops, such as nursery and greenhouse plants and floriculture. The production of Christmas trees and native ornamentals has grown slightly in recent years. Water in excellent quality and quantity supports continued interest in farm-raised trout. Organic farming has continued to increase through community-supported agriculture. Generally, farms are small and specialized and grow high-value crops.

Tourism and its related businesses are a vital part of the local economy. Federal lands provide a wealth of outdoor opportunities. They include 113,026 acres of Nantahala National Forest managed by the U.S. Forest Service and 1,100 acres of the Tennessee Valley Authority near Fontana and Cheoah Lakes. Santeetlah Lake, Joyce Kilmer Memorial Forest, and Cherohala Scenic Highway also provide recreational opportunities.

Interest in protecting agricultural land and traditions is increasing. Farms where burley tobacco once grew are reverting to raising produce and livestock in more traditional ways. Agri-tourism is a growing business which packages mountain excursions complete with pick-your-own and teaching farms, mountain culture, folk art, and crafts that illustrate mountain traditions. Outdoor recreation, cultural tourism, and eco-tourism are popular and, along with second home construction, account for an increasing portion of the local economy.

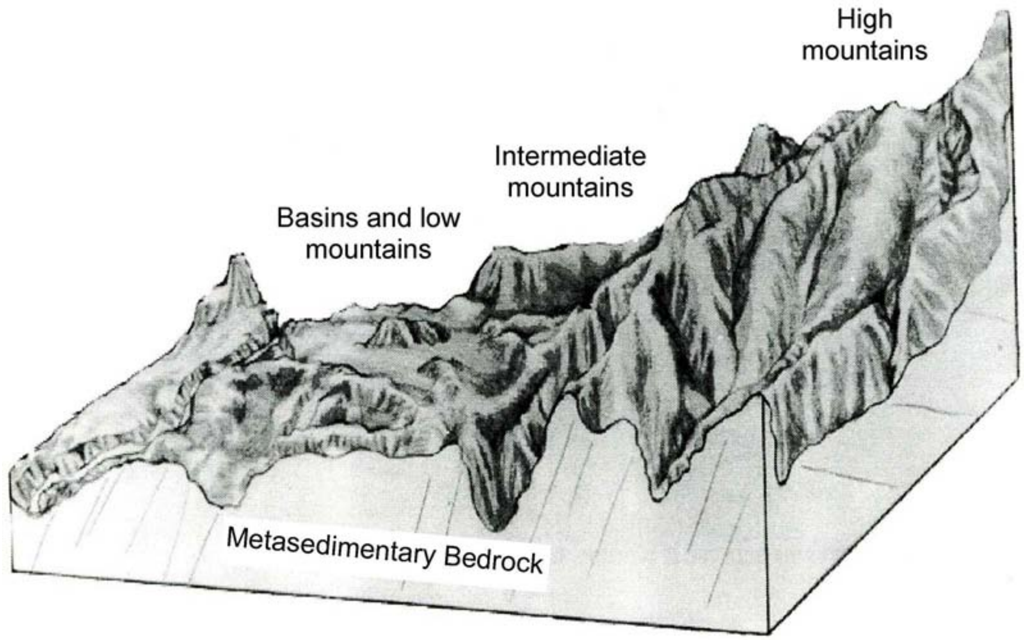


Figure 3.—A physiographic cross section of Graham County illustrating the complex topography of mountain landscapes.

Physiography, Relief, and Drainage

Graham County is part of the Great Smoky Mountains, in the Southern Blue Ridge Mountain Physiographic Province. The physiography of the county consists of high, intermediate, and low mountains; intermountain hills; coves; terraces; and flood plains (fig. 3) (North Carolina State University, 1999). Elevation ranges from 1,077 feet on the Little Tennessee River, near the Tennessee State line, to 5,560 feet on Huckleberry Knob.

The high mountain landscape is above 4,600 feet in elevation. It has steep or very steep soils on side slopes, gently sloping to steep soils on ridgetops, and moderately steep or steep soils in coves. The well drained soils are shallow to very deep to hard or weathered bedrock. The clay content of the subsoil is low. The surface layers are thick and have a very high content of organic matter. Surface stones and boulders are common. In places rock outcrops occur. This landscape is subject to very cold temperatures and windswept conditions. High mountains are confined to the west and southwest portions of the county. Huckleberry Knob, Hooper Bald, Hangover Knob, and Cheoah Bald are examples.

The intermediate mountain landscape ranges from 3,500 to 4,800 feet in elevation. It is the most extensive landscape in the county. It has moderately steep to very steep soils on side slopes and gently sloping to steep soils on ridgetops. These soils are shallow to very deep to hard or weathered bedrock and are well drained or somewhat excessively drained. Very deep, moderately steep or steep, well drained soils are in coves and drainageways where surface stones and boulders are common. In general, the clay content in the subsoil is low at the higher elevations and medium at the lower elevations; a few soils have a high amount of clay. The soils on cool aspects and in drainageways have thick surface layers that have a high content of organic matter. In coves, soils are very deep, gently sloping to moderately steep, and well drained to poorly drained. In places, rock outcrops occur. Intermediate mountains occur throughout the county. Grassy Top, Cold Spring Knob, Big Knob, High Top, and Swim Bald are examples.

The low mountain landscape ranges from 2,400 to 3,500 feet in elevation. It has moderately steep to very steep soils on side slopes and gently sloping to strongly sloping soils on ridgetops. The soils are shallow to very deep to weathered bedrock and are well drained or somewhat excessively drained. Very deep, strongly sloping to steep, well drained soils are in coves and drainageways. In general, the clay content of the subsoil is medium or high. The soils on ridgetops commonly contain more clay than those on side slopes. The soils on cool aspects and in drainageways have thick surface layers that have a high content of organic matter. In coves, soils are very deep, gently sloping to moderately steep, and well drained to poorly drained. Low mountains occur throughout the county but are dominantly in the central and eastern portions. They are typically extensions of larger mountain ranges, such as the Great Smoky Mountains and Snowbird, Cheoah, and Unicoi Mountains. They also occur within the intermountain hills landscape.

The intermountain hill landscape ranges from 1,800 to 2,800 feet in elevation. It has strongly sloping to steep soils on side slopes and gently sloping to strongly sloping soils on ridgetops. Soils are moderately deep to very deep to weathered bedrock. Surface layers are thin or eroded and have a low content of organic matter. The clay content of the subsoil is medium. Soils on ridgetops typically contain more clay than soils on side slopes. In coves, soils are very deep, gently sloping to moderately steep, and well drained. Surface layers, where uneroded, are medium or thick, commonly contain rock fragments, and have a medium or high content of organic matter. The clay content of the subsoil is medium or high. The intermountain hills occur mostly along Buffalo, Deep, Sweetwater, Atoah, and Kirkland Creeks, in and around the communities of Robbinsville, Cheoah, and Santeetlah Lake.

Terraces have nearly level to strongly sloping soils in narrow areas that run parallel to the streams. The soils are very deep, are well drained to somewhat poorly drained, and have a medium or high clay content in the subsoil. Surface layers, where uneroded, are medium or thick, commonly contain rock fragments, and have a medium or high content of organic matter. Many terraces occur between Robbinsville, Cheoah, and Tallulah along the Cheoah River and Tallulah, Sweetwater, and East Buffalo Creeks. Generally, terraces occur above the larger flood plains of intermountain hills and low mountain areas.

Flood plains have nearly level soils which run parallel to the stream channel. In general, soils next to major streams and rivers and at the lower end of watersheds are well drained to somewhat poorly drained and are moderately deep to very deep to gravelly strata. Major streams and rivers include the Cheoah River and Yellow, Tallulah, Tuskeegee, Sweetwater, Stecoah, and East Buffalo Creeks. Soils at the upper ends of watersheds, such as in the Stecoah and Fontana communities, are moderately well drained to poorly drained and shallow or moderately deep to gravelly strata. Soils along the smaller streams and branches are moderately well drained or somewhat poorly drained and are moderately deep to gravelly strata. Smaller streams and branches include South Fork Beech, Long, Squally, and Santeetlah Creeks. Poorly drained soils occur on the broader flood plains throughout the county. Generally in these soils, the clay content of the subsoil is low but ranges to medium in areas along lesser streams and at the lower end of watersheds. The surface layers, where not scoured by flooding, are medium or thick and have a medium or high content of organic matter.

Graham County is located west of the Eastern Continental Divide, and all streams drain toward the Little Tennessee River and Fontana, Cheoah, and Santeetlah Lakes. The eastern portion of the county drains into the Little Tennessee River (Fontana Lake) by way of Panther, Wolf, Stecoah, Tuskeegee, and Sawyer Creeks (fig. 4). Its waterflow originates near the Nantahala Gorge area. The western portion of the county is drained by the Cheoah River and Slickrock, Little Santeetlah, and Santeetlah Creeks. Its waterflow generally originates in the Unicoi Mountains. Tallulah, Franks,

Figure 4.—Deep mountain valleys are common in the Little Tennessee River System.

Sweetwater, Snowbird, Long, and Atoah Creeks originate in the southern portion of the county and the Snowbird Mountains and enter Santeetlah Lake near Robbinsville. Bear, Deep, Yellow, Mountain, and East Buffalo Creeks are in the northern part of the county. These watersheds originate near the Great Smoky, Cheoah, and Yellow Creek Mountains and drain toward Fontana and Cheoah Lakes. The county drains to the west by way of the Little Tennessee River watershed. The water flows westward through Fontana and Cheoah Lakes in North Carolina, southwest into the Tennessee, Ohio, and Mississippi Rivers, and eventually into the Gulf of Mexico.

Climate

In Graham County, the climate of the mountains differs greatly from that of the intermountain hills and flood plains. Climate and the weather are influenced by elevation, aspect, and wind direction, which is predominantly from the west. As elevation increases, the amount of rainfall increases and temperature decreases. Temperatures are cooler on north- to east-facing aspects. Daily temperatures can fluctuate widely, and cold or warm spells are possible year-round. There is a chance of frost in the high mountains during the summer months.

Precipitation is generally distributed throughout the year. Summer precipitation falls chiefly during thunderstorms. Heavy rains from prolonged storms occasionally cover the entire area (or occur as downbursts in individual watersheds) and can cause severe flooding in the valleys. In summer, several inches of moisture are added to the soil by fog intercept—fog at the higher elevations condensing on trees and flowing down the trunk.

In winter, precipitation in the valleys is chiefly rain with occasional snow. That in the mountains, especially above 4,000 feet in elevation, is chiefly snow, although rains are frequent. Ice storms and rime ice occur on high mountains and on prominent ridgetops and upper side slopes of intermediate mountains (fig. 5). In Graham County, snow cover does not persist except at high elevations and on northerly aspects.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Tapoco, North Carolina, during the period 1971 to 2000. **Table 2** shows probable dates of the first freeze in fall and the last freeze in spring. **Table 3** provides data on the length of the growing season. Additional climatic information is available at http://www.wcc.nrcs.usda.gov/climate/.

In winter, the average temperature is 41.8 degrees F and the average daily minimum temperature is 30.8 degrees. The lowest temperature on record, which occurred at Tapoco on January 21, 1985, was -14 degrees. In summer, the average temperature is 73.6 degrees and the average daily maximum temperature is 86.1

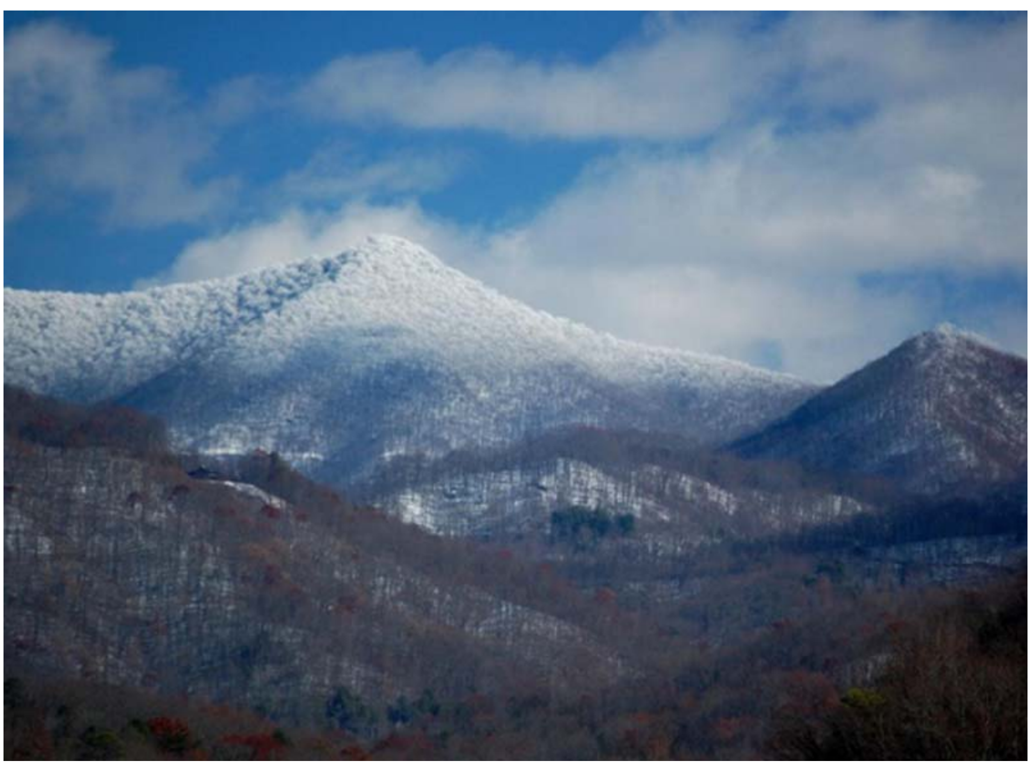


Figure 5.—Rime ice occurs on high mountains and on ridgetops and upper side slopes of prominent intermediate mountains.

Figure 6.—Slow air drainage allows frost pockets to form in late spring and early fall in nearly level or gently sloping areas low on the landscape. These areas have a shortened growing season.

degrees. The highest temperature on record, which occurred at Tapoco on July 17, 1980, was 101.0 degrees.

Growing degree days are shown in **table 1**. They are equivalent to “heat units.” During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall. Slow air drainage allows frost pockets to form in late spring and early fall in nearly level or gently sloping areas that are low on the landscape (fig. 6). These areas have a shorter growing season than the county average.

Annual precipitation varies throughout the county. Because of prevailing weather patterns that generally move west to east and because as elevation increases more rain is extracted from moisture-laden clouds, more precipitation is deposited near the higher mountains. Estimated annual rainfall amounts range from 60 inches near Topoco in the northwestern part of the county to more than 82 inches in the southwestern corner near Hooper Bald and Huckleberry Knob. The Topoco area has the lowest precipitation in the county. Annual rainfall amounts near Robbinsville, in the south-central portion of the county, average about 64 inches. Annual average rainfall is about 60 inches at Topoco, 62 inches near Yellow Creek, 64 inches in Robbinsville and Stecoah, 66 inches near Santeetlah Lake, Cheoah, Fontana Village, and Tuskeegee, 68 inches near Wauchecha Bald, 70 inches near Topton, and 72 inches near Cheoah Bald.

The average annual precipitation at Oconaluftee is 60.00 inches. Of this, 33.04 inches, or about 55 percent, usually falls from April through October. The growing season for most crops falls within this period.

The heaviest 1-day rainfall during the period of record was 5.85 inches, recorded at Tapoco on March 27, 1994. Thunderstorms occur on about 50 days each year, and most occur in July.

The average seasonal snowfall is 4.4 inches. The greatest recorded snow depth at any one time was 11 inches, recorded on February 3, 1958. On average, no days per year have at least 1 inch of snow on the ground. The heaviest 1-day snowfall on record was 12.0 inches, recorded on January 7, 1988 and on March 3, 1942.

The average relative humidity in mid-afternoon is about 57 percent. Humidity is higher at night, and the average at dawn is about 90 percent. Where air drainage is slow, near seeps and springs and along flowing water, average daytime relative humidity is higher. The sun shines 59 percent of the time in summer and 56 percent in winter. The prevailing wind is generally from the north-northwest but is highly dependent on location in this mountainous county. Valleys, however, channel the wind flow in all directions throughout the year. Average windspeed is highest, around 6.0 miles per hour, in January. High mountain ridgetops and side slopes and prominent intermediate mountain ridgetops are windswept. Sustained winds of more than 25 miles per hour are common.

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock (fig. 7). They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Figure 7.—As shown in figure, soil characteristics can fluctuate significantly over a short distance. Soil mapping concepts and land use interpretations are developed by observing the variations and interactions of soil, geology, vegetation, and climate on different landforms.

Figure 8.—An example of steep mountain side slopes ranging from 30 to 50 percent slopes.

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

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

A soil boundary or map unit delineation designates the landform and slope on which a soil occurs. Landform (position) is the three-dimensional part of the land surface and has a distinctive shape. Examples include flood plain, cove, side slope, and ridgetop. The slope (steepness) is given as a range, such as 15 to 30 percent. All or part of the slope range may exist within a delineation (fig. 8).

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify the soils. After describing the soils and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research (Buol and others, 1980).

While a soil survey is in progress, samples of some of the soils in the area are generally collected for laboratory analyses and for engineering tests. The data from these analyses and tests and from field-observed characteristics and soil properties are used to predict behavior of the soils under different uses (Buol and others, 1980).

Interpretations are field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

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

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

Survey Procedures

The general procedures followed in making this survey are described in the “National Soil Survey Handbook” (USDA-NRCS, 1996a) of the Natural Resources Conservation Service and in the “Soil Survey Manual” (USDA-NRCS, 1993).

Before fieldwork began, preliminary boundaries of slopes and landforms were plotted stereoscopically on leaf-off aerial photographs taken in March of 1988 at a scale of 1:12,000. United States Geological Survey geologic and topographic maps at a scale of 1:24,000 were also used. Map units were then designed according to the pattern of soils interpreted from photographs, maps, and field observations.

Traverses in the valleys were made by truck or on foot. The soils were examined at intervals ranging from a few hundred feet to about 1/4 mile, depending on the landscape and soil pattern. Observations of special features, such as landforms, vegetation, and evidence of flooding, were made continuously without regard to spacing. Soil boundaries were determined on the basis of soil examinations, observations, and photo interpretations. In many areas, such as those where very steep slopes intersect with flood plains, these boundaries are precise because of an abrupt change in the landform. The soils were examined with the aid of a hand probe, a bucket auger, or a spade to a depth of about 3 to 5 feet. Typical soil pedons were observed in pits dug by hand or with a back hoe.

Traverses in the mountainous areas were made by truck or on foot along the existing network of roads and trials. These traverses commonly were made a few miles apart where the geologic materials and landscapes were uniform. In areas where differences in geologic material or landscape were observed, traverses were made at intervals close enough for the soil scientists to observe any differences among the soils. Examinations were made at intervals ranging from a few hundred feet to about 1/4 mile. Observations of landforms and vegetation were made continuously without regard to spacing. Where soil profiles were readily observable, such as along recently constructed access roads and along logging roads, observations of the content of rock fragments, depth to bedrock, depth of rooting, the landform, and the underlying material were made without regard to spacing. Soil boundaries were plotted stereoscopically on the basis of parent material, landform, and relief. Many of these boundaries cannot be exact because they fall within a zone of gradual change between landforms, such as an area where a mountain ridge becomes a mountainside. Much intermingling of the soils occurs in these zones.

Samples for chemical and physical analyses were taken from the site of the typical pedon of the major soils in the survey area. Most of the analyses were made by the National Soil Survey Laboratory, Lincoln, Nebraska. Some soils were analyzed by the North Carolina State University Soils Laboratory, Raleigh, North Carolina. Commonly used laboratory procedures were followed (USDA-NRCS, 1996a).

All field soil mapping on unrectified aerial photographs, map unit delineations, and surface drainage were transferred by hand. Cultural features were transferred from 7.5-minute topographic maps of the United States Geological Survey. All field mapping of U.S. Forest Service land, land of the Eastern Band of the Cherokee Nation, and private lands have been transferred to digital ortho quarter quads at a scale of 1:12,000 (1 inch equals 1,000 feet). These maps are posted online at http://websoilsurvey.nrcs.usda.gov/app/. Soils data is also available at http://soildatamart.nrcs.usda.gov/.

General Soil Map Units

The general soil map in this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape (fig. 9). Typically, it consists of one or more major soils or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The components of one map unit can occur in another but in a different pattern.

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

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

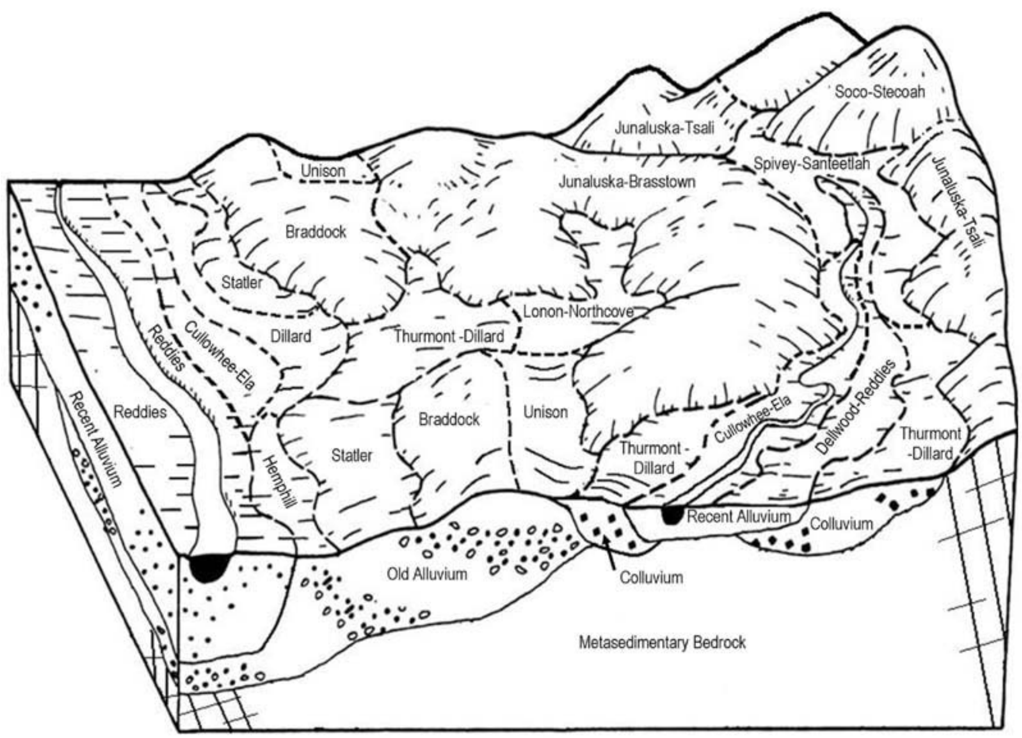


Figure 9.—Typical relationship of soils, landform positions, and parent materials from flood plains associated with Reddies soils to intermediate mountains associated with Soco and Stecoah soils.

Detailed Soil Map Units

The map units delineated on the detailed soil maps in this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The contrasting components are mentioned in the map unit descriptions. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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

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

Soils that have profiles that are almost alike make up a *soil series*. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. The soils of a given series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Cheoah channery loam, 30 to 50 percent slopes, stony, is a phase of the Cheoah series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes. A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alarka-Wesser complex, 0 to 8 percent slopes, occasionally flooded, is an example.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. The Rock outcrop part of Ditney-Unicoi-Rock outcrop complex, 50 to 95 percent slopes, very stony, is an example.

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

Soil Survey as a Land Management Tool

The purpose of this soil survey is not to prescribe (dictate) specific methods of overcoming limitations but to point out or flag soil properties and site features so they can be addressed by land managers and users. In the following detailed map unit descriptions, these properties and features are referred to as management concerns. Management measures are options or reference points to consider for a given use.

Soil interpretations and limitations are based on the potential risk that soil properties and site features pose for a given use. During the survey these were referenced by field observations, by laboratory analysis, and through contact with local land use professionals. Updating soil interpretations is a dynamic process. As more information is collected and land management practices are developed or modified, interpretations and suitabilities may be revised.

Site-specific features should also be considered. An onsite investigation may be necessary to determine if any or all of the management concerns affect the use in question or if the management measures are relative. The goals of the land manager or user and the resources available to them then determine the suitability (favorability) of any soil map unit for a given use (fig. 10).

Soil Interpretations and Suitability Ratings

A suitability rating identifies the degree to which the soils in a map unit are favorable for a given use within the survey area.

Well suited.—The soils have properties favorable for the use. There are no major soil limitations although inclusions of limiting, dissimilar soils or site features may be present. Good soil performance and low maintenance can be expected. Vegetation or other attributes can easily be maintained, improved, or established.

Suited.—The soils are moderately favorable for the use. One or more soil properties make these soils less desirable than those rated well suited. Vegetation or other attributes can be maintained, improved, or established but a more intensive management effort is needed to maintain the resource base.

Poorly suited.—The soils have one or more soil properties unfavorable for the use. Overcoming the unfavorable property requires special design, extra maintenance, or costly alteration. Vegetation or other attributes are difficult to establish or maintain.

Unsuited.—The expected performance of the soils is unacceptable, and the use generally should not be undertaken.

Figure 10.—This survey is designed for many different land uses, including agriculture, forestry, and building site development. Soil properties and site features that affect land use are identified, and management measures are offered for consideration.

AkB—Alarka-Wesser complex, 0 to 8 percent slopes, occasionally flooded

Setting

Landscape: Intermediate mountains, dominantly along Snowbird, Little Snowbird, and Santeetlah Creeks in the southwestern part of the county
Elevation range: 2,200 to 4,650 feet
Landform: Hanging coves
Landform position: Planar to slightly concave toeslopes and bottomland slopes, in the upper reaches of watersheds
Shape of areas: Irregular
Size of areas: Up to 40 acres

Map Unit Composition

Alarka soil and similar inclusions: 65 percent
Wesser soil and similar inclusions: 25 percent
Dissimilar inclusions: 10 percent

Typical Profile

Alarka

Surface layer:
0 to 3 inches—moderately decomposed plant material
3 to 10 inches—highly decomposed plant material

Subsoil:
10 to 13 inches—brown loam with mottles in shades of brown and black

13 to 21 inches—yellowish brown loam with mottles in shades of brown, red, gray, and black

Underlying material:
21 to 36 inches—light pale red very fine sandy loam
36 to 80 inches—yellowish brown, red, and strong brown very gravelly loamy sand

Wesser

Surface layer:
0 to 3 inches—highly decomposed plant material
3 to 6 inches—very dark grayish brown sandy loam with mottles in shades of brown

Underlying material:
6 to 13 inches—black loamy fine sand with mottles in shades of brown
13 to 19 inches—black sand with mottles in shades of brown
19 to 80 inches—black extremely gravelly sand

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Alarka—poorly drained; Wesser—poorly drained or very poorly drained
General texture class: Alarka—organic matter over loamy material in the upper part and sandy or sandy-skeletal material in the lower part; Wesser—sandy-skeletal
Permeability: Alarka—moderately slow or slow in the upper part and moderately rapid in the lower; Wesser—moderately rapid in the surface horizon and the upper part of the underlying material and saturated throughout the year in the lower part of the underlying material
Available water capacity: Low
Depth to seasonal high water table: 1.0 foot or less from January through December
Hazard of flooding: Occasional, throughout the year with standing water for less than 2 days
Shrink-swell potential: Low
Slope class: Alarka—nearly level to strongly sloping; Wesser—nearly level or gently sloping
Soil slippage potential: None
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Slight or moderate
Organic matter content of surface layer: High or very high
Potential for frost action: Moderate
Special climatic conditions: Soils subject to slow air drainage, which allows late spring and early fall frosts
Soil reaction: Alarka—ultra acid to very strongly acid; Wesser—extremely acid to strongly acid throughout
Parent material: Colluvium, local alluvium, and underlying skeletal alluvial strata derived from low-grade metasedimentary rock
Depth to bedrock: More than 60 inches
Depth to contrasting material: Alarka—10 to 40 inches to deposits of sand, gravel, and cobbles that are stratified with sandy or loamy material; Wesser—less than 10 inches to deposits of sand, gravel, or cobbles that are stratified with sandy or loamy material
Other distinctive properties: Soils subject to overland flow of storm water from adjacent uplands; random areas of seeps and springs; ponding throughout the year in areas of the Wesser soil

Minor Components

Dissimilar inclusions:
- Moderately well drained Dellwood and Reddies soils that are loamy in the upper part and 8 to 40 inches deep to strata with a high content of rock fragments, along stream channels
- Somewhat poorly drained and poorly drained Cullowhee and Ela soils that have subsoils that are loamy in the upper part and that are 20 to 40 inches deep to strata with a high content of rock fragments, along stream channels
- Well drained Whiteoak soils on toeslopes
- Thurmont soils that have water table at a depth of 40 to 60 inches, on toeslopes
- Random areas of soils that have strata with a high content of rock fragments at a depth of more than 40 inches
- Areas that are rarely flooded for very brief periods
- Random areas of soils on slopes of more than 8 percent

Similar inclusions:
- Alarka soils that have surface layers of sandy loam or fine sandy loam
- Wesser soils that have surface layers of fine sandy loam or loam

Land Use

Dominant Uses: Wildlife habitat

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the wetness and flooding. A site should be selected on better suited soils.

Pasture and hayland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the wetness and flooding. A site should be selected on better suited soils.

Orchard and ornamental crops
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for orchard and ornamental crops because of the wetness and flooding. A site should be selected on better suited soils.

Woodland Management and Productivity

Potential for commercial species: Very low
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for timber production because of the wetness and flooding. A site should be selected on better suited soils.

Urban Development

Dwellings
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for dwellings because of the wetness and flooding. A site should be selected on better suited soils.

Septic tank absorption fields
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for septic tank absorption fields because of the flooding, wetness, and poor filtering capacity. Contact the local Health Department for additional guidance.

Local roads and streets
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for roads and streets because of the wetness and flooding. A site should be selected on better suited soils.

Lawns and landscaping
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for lawns and landscaping because of the wetness and flooding. A site should be selected on better suited soils.

Interpretive Groups

Land capability classification: 7w

BkB2—Braddock clay loam, 2 to 8 percent slopes, moderately eroded

Setting

Landscape: Mountain valleys of low mountains and intermountain hills, dominantly along Tallulah, Sweetwater, and Long Creeks near Robbinsville, in the central part of the county
Elevation range: 1,980 to 2,270 feet
Landform: High stream terraces
Landform position: Benches
Shape of areas: Long and narrow or irregular
Size of areas: Up to 11 acres

Map Unit Composition

Braddock soil and similar inclusions: 80 percent
Dissimilar inclusions: 20 percent

Typical Profile

Surface layer:
0 to 8 inches—yellowish red clay loam

Subsoil:
8 to 34 inches—red clay
34 to 80 inches—red clay loam

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
General texture class: Clayey
Permeability: Moderate in the surface horizon and subsoil and moderately rapid in the underlying material
Available water capacity: High

Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Moderate
Slope class: Gently sloping
Soil slippage potential: None
Extent of erosion: Moderate, about 25 to 75 percent of the original surface layer has been removed
Hazard of water erosion: Moderate
Organic matter content of surface layer: Low or moderate
Potential for frost action: Moderate
Special climatic conditions: Soil subject to slow air drainage, which allows late spring and early fall frosts
Soil reaction: Very strongly acid to moderately acid throughout the profile
Parent material: Old alluvium derived from low-grade metasedimentary rock
Depth to bedrock: More than 60 inches
Other distinctive properties: A high content of clay in the subsoil; soil subject to overland flow of storm water from adjacent uplands

Minor Components

Dissimilar inclusions:
- Unison soils that have thicker surface layers with more organic matter and a browner subsoil, in concave areas
- Statler soils that have thicker surface layers with more organic matter and have less clay in the subsoil, in concave areas
- Thurmont soils that have less clay and a water table at a depth of 40 to 60 inches, in depressions, on toeslopes, and in drainageways
- Moderately well drained to poorly drained soils in depressions and on toeslopes
- Somewhat poorly drained Cullowhee soils that are loamy in the upper part and have strata with a high content of rock fragments at a depth of 20 to 40 inches, along stream channels
- Random areas of soils on slopes of less than 2 percent or more than 8 percent
- Udorthents and Urban land in and around Robbinsville and other densely populated areas along stream channels

Similar inclusions:
- Braddock soils that have surface layers of loam or sandy clay loam

Land Use

Dominant Uses: Cropland, pasture, and hayland
Other Uses: Building site development

Agricultural Development

Cropland
Suitability: Well suited
Management concerns: Erodibility, tilth, root penetration, pesticide retention, soil fertility, and climate
Management measures and considerations:
- Using resource management systems that include contour farming, conservation tillage, crop residue management, stripcropping, winter cover crops, and crop rotations which include grasses and legumes helps to minimize soil erosion, maximize the infiltration of rainfall, increase the available water capacity, and improve soil fertility.
- Avoiding tillage during wet periods, incorporating crop residue into the soil, or leaving residue on the soil surface helps to minimize clodding and crusting and increases the infiltration of rainfall.

- Chisel plowing and subsoiling help to break through claypans, allowing increases in root penetration and rainfall infiltration.
- Using perennial grasses and legumes in rotation helps to penetrate and break up the clayey root zone.
- This soil may retain soil-applied herbicides and other pesticides because of the high clay content. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides, which become tied up by the high clay content.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes crop productivity.
- Applying large granules or banding of phosphorus helps to overcome phosphorus fixation.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.

Pasture and hayland
Suitability: Well suited
Management concerns: Erodibility, root penetration, pesticide retention, and soil fertility
Management measures and considerations:
- Preparing seedbeds on the contour or across the slope helps to minimize soil erosion and increases germination.
- Fencing livestock away from creeks and streams helps to prevent streambank erosion and sedimentation.
- Using perennial grasses and legumes helps to penetrate and break up the clayey root zone.
- This soil may retain soil-applied herbicides and other pesticides because of the high clay content. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides, which become tied up by the high clay content.
- Fencing livestock away from creeks and streams helps to prevent streambank erosion and sedimentation.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Applying large granules or banding of phosphorus helps to overcome phosphorus fixation.
- Using rotational grazing, implementing a well planned harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.

Orchard and ornamental crops
Suitability: Orchards—well suited; ornamentals—suited
Management concerns: Erodibility, root disease, climate, ball and burlap harvesting, pesticide retention, and soil fertility
Management measures and considerations:
- Establishing and maintaining sod between rows and on access roads helps to reduce the hazard of erosion.
- Because of the restricted movement of air and water due to the high clay content of the subsoil, phytophthora root disease is a severe limitation for Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.

- Avoiding ball and burlap harvesting during extreme moisture conditions helps to prevent fracture or deformation of the ball and tearing of plant roots.
- This soil may retain soil-applied herbicides and other pesticides because of the high clay content. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides, which become tied up by the high clay content.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximize productivity.
- Applying large granules or banding of phosphorus helps to overcome phosphorus fixation.

Woodland Management and Productivity

Potential for commercial species: Very high for eastern white pine and moderately high for cove hardwoods
Suitability: Well suited
Management concerns: Erodibility and equipment use
Management measures and considerations:
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.
- Because of the high content of clay, revegetating cut and fill slopes can be difficult.
- When the soil is wet, skid trails and unsurfaced roads are highly erodible and very slick due to the clay content of the subsoil.
- Avoiding logging operations during periods when the soil is saturated helps to prevent rutting of the soil surface and damage to tree roots due to soil compaction.
- Livestock should not be allowed to graze in areas managed for woodland.
- Soil-applied herbicides are retained due to herbicide-clay bonding, which may damage tree seedlings when cropland is converted to woodland.

Urban Development

Dwellings

Suitability: Well suited
Management concerns: Erodibility, high clay content, shrink-swell potential, corrosivity, seeps and springs, and large stones
Management measures and considerations:
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Because of the high content of clay, revegetating cut and fill slopes can be difficult.
- The soil is slippery and sticky when wet and slow to dry.
- Reinforcing foundations and footings or backfilling with coarse textured material helps to strengthen buildings and prevents damage caused by shrinking and swelling.
- Using corrosion-resistant materials helps to reduce the risk of damage to uncoated steel and concrete.
- Installing a subsurface drainage system around foundations helps to intercept water from seeps and springs.
- Locating structures away from intermittent and perennial drainageways helps to minimize structural damage from overland flow of storm water.
- Large stones may be encountered during excavation.

Septic tank absorption fields
Suitability: Suited
Management concerns: Restricted permeability, high clay content, seeps and springs, and large stones
Management measures and considerations:
- Contact the local Health Department for guidance on sanitary facilities.
- Avoiding the installation of septic system distribution lines during wet periods helps to minimize the smearing and sealing of trench walls.
- Raking trench walls helps to prevent the sealing of soil pores which may occur during the excavation of septic tank absorption fields.
- Excavations may cut into seeps and springs. These areas should be avoided.
- Large stones may be encountered during excavation.

Local roads and streets
Suitability: Well suited
Management concerns: Low strength, high clay content, erodibility, frost action, and seeps and springs
Management measures and considerations:
- Incorporating sand and gravel into the soil, compacting roadbeds, and designing roads that conform to natural slopes help to improve soil strength.
- Using a nondegradeable, permeable fabric filter cloth between the roadbed and the soil surface helps to restrict the loss of stone into the soil.
- The soil is slippery and sticky when wet and slow to dry.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Because of the high content of clay, revegetating cut and fill slopes can be difficult.
- The permanent surfacing of roads or the use of suitable subgrade or base material increases soil strength, allows the year-round use of roads, and helps to reduce the damage from frost heaving.
- Intercepting and diverting underground water from seeps and springs helps to stabilize cut and fill slopes.

Lawns and landscaping
Suitability: Suited
Management concerns: Erodibility, high clay content, soil compaction, root disease, pesticide retention, climate, and soil fertility
Management measures and considerations:
- Designing plantings on natural contours helps to increase water infiltration.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Because of the high content of clay, revegetating cut and fill slopes can be difficult.
- The soil is slippery and sticky when wet and slow to dry.
- Avoiding the use of heavy equipment in areas to be landscaped helps to prevent soil compaction.
- Because of the restricted movement of air and water due to the high clay content of the subsoil, phytophthora root disease is a severe limitation for Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.

- This soil may retain soil-applied herbicides and other pesticides due to the high content of clay. The concentration of pesticides may be damaging to landscape plants.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.
- Using lime, fertilizer, mulch, and irrigation helps to establish lawns and landscape plants.
- Applying large granules or banding of phosphorus helps to overcome phosphorus fixation.
- Topsoil should be stockpiled from disturbed areas and replaced before landscaping.

Interpretive Groups

Land capability classification: 2e

BkC2—Braddock clay loam, 8 to 15 percent slopes, moderately eroded

Setting

Landscape: Mountain valleys of low mountains and intermountain hills, dominantly along Tallulah, Sweetwater, and Long Creeks near Robbinsville, in the central part of the county
Elevation range: 1,740 to 2,270 feet
Landform: High stream terraces
Landform position: Benches
Shape of areas: Irregular
Size of areas: Up to 27 acres

Map Unit Composition

Braddock soil and similar inclusions: 80 percent
Dissimilar inclusions: 20 percent

Typical Profile

Surface layer:
0 to 8 inches—yellowish red clay loam

Subsoil:
8 to 34 inches—red clay
34 to 80 inches—red clay loam

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
General texture class: Clayey
Permeability: Moderate in the surface horizon and subsoil and moderately rapid in the underlying material
Available water capacity: High
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Moderate
Slope class: Strongly sloping
Soil slippage potential: None
Extent of erosion: Moderate, about 25 to 75 percent of the original surface layer has been removed

Hazard of water erosion: Severe
Organic matter content of surface layer: Moderate or high
Potential for frost action: Moderate
Special climatic conditions: Soil subject to slow air drainage, which allows late spring and early fall frosts
Soil reaction: Very strongly acid to moderately acid throughout the profile
Parent material: Old alluvium derived from low-grade metasedimentary rock
Depth to bedrock: More than 60 inches
Other distinctive properties: A high content of clay in the subsoil; soil subject to overland flow of storm water from adjacent uplands

Minor Components

Dissimilar inclusions:
- Unison soils that have thicker surface layers with more organic matter and a browner subsoil, in concave areas
- Statler soils that have thicker surface layers with more organic matter and have less clay in the subsoil, in concave areas
- Thurmont soils that have less clay and have a water table at a depth of 40 to 60 inches, in depressions, on toeslopes, and in drainageways
- Moderately well drained to poorly drained soils in depressions and on toeslopes
- Somewhat poorly drained Cullowhee soils that are loamy in the upper part and have strata with a high content of rock fragments at a depth of 20 to 40 inches, along stream channels
- Random areas of soils on slopes of less than 8 percent or more than 15 percent
- Udorthents and Urban land in and around Robbinsville and other densely populated areas along stream channels

Similar inclusions:
- Braddock soils that have surface layers of loam or sandy clay loam

Land Use

Dominant Uses: Cropland, pasture, and hayland
Other Uses: Building site development

Agricultural Development

Cropland

Suitability: Suited
Management concerns: Erodibility, equipment use, tilth, root penetration, pesticide retention, soil fertility, and climate
Management measures and considerations:
- Using conservation practices, such as contour farming, winter cover crops, and crop rotations which include grasses and legumes, helps to minimize soil erosion, maximize the infiltration of rainfall, increase the available water capacity, and improve soil fertility.
- The slope may limit equipment use in the steeper areas.
- Avoiding tillage during wet periods, incorporating crop residue into the soil, or leaving residue on the soil surface helps to minimize clodding and crusting and increases the infiltration of rainfall.
- Chisel plowing and subsoiling help to break through claypans, allowing increases in root penetration and rainfall infiltration.
- Using perennial grasses and legumes in rotation helps to penetrate and break up the clayey root zone.
- This soil may retain soil-applied herbicides and other pesticides because of the high clay content. The concentration of pesticides may be damaging to future crops.

- Plant-applied pesticides may be more effective than soil-applied pesticides, which become tied up by the high clay content.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes crop productivity.
- Applying large granules or banding of phosphorus helps to overcome phosphorus fixation.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.

Pasture and hayland
Suitability: Well suited
Management concerns: Erodibility, equipment use, root penetration, pesticide retention, and soil fertility
Management measures and considerations:
- Growing adapted plants helps to ensure the production of high-quality forage and minimize soil erosion.
- The slope may limit the use of equipment in the steeper areas when harvesting hay crops.
- Using perennial grasses and legumes helps to penetrate and break up the clayey root zone.
- This soil may retain soil-applied herbicides and other pesticides because of the high clay content. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides, which become tied up by the high clay content.
- Fencing livestock away from creeks and streams helps to prevent streambank erosion and sedimentation.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Applying large granules or banding of phosphorus helps to overcome phosphorus fixation.
- Using rotational grazing, implementing a well planned harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.

Orchard and ornamental crops
Suitability: Orchards—well suited; ornamentals—suited
Management concerns: Erodibility, equipment use, root disease, climate, ball and burlap harvesting, pesticide retention, and soil fertility
Management measures and considerations:
- Establishing and maintaining sod between rows and on access roads helps to reduce the hazard of erosion.
- The slope may limit equipment use in the steeper areas.
- Because of the restricted movement of air and water due to the high clay content of the subsoil, phytophthora root disease is a severe limitation for Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.
- Avoiding ball and burlap harvesting during extreme moisture conditions helps to prevent fracture or deformation of the ball and tearing of plant roots.
- This soil may retain soil-applied herbicides and other pesticides because of the high clay content. The concentration of pesticides may be damaging to future crops.

- Plant-applied pesticides may be more effective than soil-applied pesticides, which become tied up by the high clay content.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximize productivity.
- Applying large granules or banding of phosphorus helps to overcome phosphorus fixation.

Woodland Management and Productivity

Potential for commercial species: Very high for eastern white pine and moderately high for cove hardwoods
Suitability: Well suited
Management concerns: Erodibility and equipment use
Management measures and considerations:
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.
- Because of the high content of clay, revegetating cut and fill slopes can be difficult.
- When the soil is wet, skid trails and unsurfaced roads are highly erodible and very slick due to the clay content of the subsoil.
- Avoiding logging operations during periods when the soil is saturated helps to prevent rutting of the soil surface and damage to tree roots due to soil compaction.
- Livestock should not be allowed to graze in areas managed for woodland.
- Soil-applied herbicides are retained due to herbicide-clay bonding, which may damage tree seedlings when cropland is converted to woodland.

Urban Development

Dwellings
Suitability: Suited
Management concerns: Erodibility, slope, shrink-swell potential, high clay content, corrosivity, seeps and springs, and large stones
Management measures and considerations:
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Designing structures so that they conform with natural slopes helps to improve soil performance.
- Because of the high content of clay, revegetating cut and fill slopes can be difficult.
- The soil is slippery and sticky when wet and slow to dry.
- Reinforcing foundations and footings or backfilling with coarse textured material helps to strengthen buildings and prevents damage caused by shrinking and swelling.
- Using corrosion-resistant materials helps to reduce the risk of damage to uncoated steel and concrete.
- Installing a subsurface drainage system around foundations helps to intercept water from seeps and springs.
- Locating structures away from intermittent and perennial drainageways helps to minimize structural damage from overland flow of storm water.
- Large stones and boulders may be encountered during excavation.

Septic tank absorption fields
Suitability: Suited

Management concerns: Restricted permeability, high clay content, slope, seeps and springs, and large stones
Management measures and considerations:
- Contact the local Health Department for guidance on sanitary facilities.
- Avoiding the installation of septic system distribution lines during wet periods helps to minimize the smearing and sealing of trench walls.
- Raking trench walls helps to prevent the sealing of soil pores which may occur during the excavation of septic tank absorption fields.
- Installing distribution lines on the contour helps to improve the performance of septic tank absorption fields.
- Excavations may cut into seeps and springs. These areas should be avoided.
- Large stones and boulders may be encountered during excavation.

Local roads and streets
Suitability: Suited
Management concerns: Low strength, high clay content, slope, erodibility, frost action, and seeps and springs
Management measures and considerations:
- Incorporating sand and gravel into the soil, compacting roadbeds, and designing roads that conform to natural slopes help to improve soil strength.
- Using a nondegradeable, permeable fabric filter cloth between the roadbed and the soil surface helps to restrict the loss of stone into the soil.
- The soil is slippery and sticky when wet and slow to dry.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Because of the high content of clay, revegetating cut and fill slopes can be difficult.
- The permanent surfacing of roads or the use of suitable subgrade or base material increases soil strength, allows the year-round use of roads, and helps to reduce the damage from frost heaving.
- Intercepting and diverting underground water from seeps and springs helps to stabilize cut and fill slopes.

Lawns and landscaping
Suitability: Suited
Management concerns: Erodibility, slope, high clay content, soil compaction, root disease, pesticide retention, climate, and soil fertility
Management measures and considerations:
- Designing plantings on natural contours helps to increase water infiltration.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Because of the high content of clay, revegetating cut and fill slopes can be difficult.
- The soil is slippery and sticky when wet and slow to dry.
- Avoiding the use of heavy equipment in areas to be landscaped helps to prevent soil compaction.
- Because of the restricted movement of air and water due to the high clay content of the subsoil, phytophthora root disease is a severe limitation for Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.

- This soil may retain soil-applied herbicides and other pesticides due to the high content of clay. The concentration of pesticides may be damaging to landscape plants.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.
- Using lime, fertilizer, mulch, and irrigation helps to establish lawns and landscape plants.
- Applying large granules or banding of phosphorus helps to overcome phosphorus fixation.
- Topsoil should be stockpiled from disturbed areas and replaced before landscaping.

Interpretive Groups

Land capability classification: 3e

BkD2—Braddock clay loam, 15 to 30 percent slopes, moderately eroded

Setting

Landscape: Mountain valleys of low mountains and intermountain hills, dominantly along Tallulah, Sweetwater, and Long Creeks near Robbinsville, in the central part of the county
Elevation range: 1,700 to 2,820 feet
Landform: High stream terraces
Landform position: Benches
Shape of areas: Irregular
Size of areas: Up to 28 acres

Map Unit Composition

Braddock soil and similar inclusions: 85 percent
Dissimilar inclusions: 15 percent

Typical Profile

Surface layer:
0 to 8 inches—yellowish red clay loam

Subsoil:
8 to 34 inches—red clay
34 to 80 inches—red clay loam

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
General texture class: Clayey
Permeability: Moderate in the surface horizon and subsoil and moderately rapid in the underlying material
Available water capacity: High
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Moderate
Slope class: Moderately steep
Soil slippage potential: None
Extent of erosion: Moderate, about 25 to 75 percent of the original surface layer has been removed

Hazard of water erosion: Very severe
Organic matter content of surface layer: Moderate or high
Potential for frost action: Moderate
Special climatic conditions: Soil subject to slow air drainage, which allows late spring and early fall frosts
Soil reaction: Very strongly acid to moderately acid throughout the profile
Parent material: Old alluvium derived from low-grade metasedimentary rock
Depth to bedrock: More than 60 inches
Other distinctive properties: A high content of clay in the subsoil; soil subject to overland flow of storm water from adjacent uplands

Minor Components

Dissimilar inclusions:
- Unison soils that have thicker surface layers with more organic matter and a browner subsoil, in concave areas
- Thurmont soils that have a water table at a depth of 40 to 60 inches, in depressions, on toeslopes, and in drainageways
- Soils which are well drained and brown and have less clay in the subsoil, in depressions and on toeslopes
- Random areas of soils on slopes of less than 15 percent or more than 30 percent near uplands and stream channels
- Udorthents and Urban land in and around Robbinsville and other densely populated areas along stream channels

Similar inclusions:
- Braddock soils that have surface layers of loam or sandy clay loam

Land Use

Dominant Uses: Pasture and hayland
Other Uses: Cropland and building site development

Agricultural Development

Cropland
Suitability: Poorly suited
Management concerns: Equipment use, erodibility, tilth, root penetration, pesticide retention, soil fertility, and climate
Management measures and considerations:
- This soil is difficult to manage for cultivated crops because the slope limits equipment use.
- Using conservation practices, such as contour farming, winter cover crops, and crop rotations which include grasses and legumes, helps to minimize soil erosion, maximize the infiltration of rainfall, increase the available water capacity, and improve soil fertility.
- Avoiding tillage during wet periods, incorporating crop residue into the soil, or leaving residue on the soil surface helps to minimize clodding and crusting and increases the infiltration of rainfall.
- Chisel plowing and subsoiling help to break through claypans, allowing increases in root penetration and rainfall infiltration.
- Using perennial grasses and legumes in rotation helps to penetrate and break up the clayey root zone.
- This soil may retain soil-applied herbicides and other pesticides because of the high clay content. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides, which become tied up by the high clay content.

- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes crop productivity.
- Applying large granules or banding of phosphorus helps to overcome phosphorus fixation.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.

Pasture and hayland
Suitability: Suited
Management concerns: Equipment use, erodibility, root penetration, pesticide retention, and soil fertility
Management measures and considerations:
- The slope limits the use of equipment in the steeper areas.
- Fencing livestock away from creeks and streams helps to prevent streambank erosion and sedimentation.
- Using perennial grasses and legumes in rotation helps to penetrate and break up the clayey root zone.
- This soil may retain soil-applied herbicides and other pesticides because of the high clay content. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides, which become tied up by the high clay content.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Applying large granules or banding of phosphorus helps to overcome phosphorus fixation.
- Using rotational grazing, implementing a well planned harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.

Orchard and ornamental crops
Suitability: Suited
Management concerns: Equipment use, erodibility, root disease, climate, ball and burlap harvesting, pesticide retention, and soil fertility
Management measures and considerations:
- This soil may be difficult to manage for orchard or ornamental crops because the slope limits equipment use.
- Establishing and maintaining sod between rows and on access roads helps to reduce the hazard of erosion.
- Because of the restricted movement of air and water due to the high clay content of the subsoil, phytophthora root disease is a severe limitation for Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.
- Avoiding ball and burlap harvesting during extreme moisture conditions helps to prevent fracture or deformation of the ball and tearing of plant roots.
- This soil may retain soil-applied herbicides and other pesticides because of the high clay content. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides, which become tied up by the high clay content.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximize productivity.

- Applying large granules or banding of phosphorus helps to overcome phosphorus fixation.

Woodland Management and Productivity

Potential for commercial species: Very high for eastern white pine and moderately high for cove hardwoods
Suitability: Suited
Management concerns: Erodibility and equipment use
Management measures and considerations:
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.
- Because of the high content of clay, revegetating cut and fill slopes can be difficult.
- When the soil is wet, skid trails and unsurfaced roads are highly erodible and very slick due to the clay content of the subsoil.
- Avoiding logging operations during periods when the soil is saturated helps to prevent rutting of the soil surface and damage to tree roots due to soil compaction.
- Livestock should not be allowed to graze in areas managed for woodland.
- Soil-applied herbicides are retained due to herbicide-clay bonding, which may damage tree seedlings when cropland is converted to woodland.

Urban Development

Dwellings
Suitability: Poorly suited
Management concerns: Slope, erodibility, shrink-swell potential, high clay content, corrosivity, seeps and springs, and large stones
Management measures and considerations:
- Designing structures so that they conform with natural slopes helps to improve soil performance.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Because of the high content of clay, revegetating cut and fill slopes can be difficult.
- The soil is slippery and sticky when wet and slow to dry.
- Reinforcing foundations and footings or backfilling with coarse textured material helps to strengthen buildings and prevents damage caused by shrinking and swelling.
- Using corrosion-resistant materials helps to reduce the risk of damage to uncoated steel and concrete.
- Installing a subsurface drainage system around foundations helps to intercept water from seeps and springs.
- Locating structures away from intermittent and perennial drainageways helps to minimize structural damage from overland flow of storm water.
- Large stones and boulders may be encountered during excavation.

Septic tank absorption fields
Suitability: Poorly suited
Management concerns: Slope, restricted permeability, high clay content, seeps and springs, and large stones
Management measures and considerations:
- Contact the local Health Department for guidance on sanitary facilities.

- Installing distribution lines on the contour helps to improve the performance of septic tank absorption fields.
- Avoiding the installation of septic system distribution lines during wet periods helps to minimize the smearing and sealing of trench walls.
- Raking trench walls helps to prevent the sealing of soil pores which may occur during the excavation of septic tank absorption fields.
- Excavations may cut into seeps and springs. These areas should be avoided.
- Large stones and boulders may be encountered during excavation.

Local roads and streets
Suitability: Poorly suited
Management concerns: Low strength, high clay content, slope, erodibility, frost action, and seeps and springs
Management measures and considerations:
- Incorporating sand and gravel into the soil, compacting roadbeds, and designing roads that conform to natural slopes help to improve soil strength.
- Using a nondegradeable, permeable fabric filter cloth between the roadbed and the soil surface helps to restrict the loss of stone into the soil.
- The soil is slippery and sticky when wet and slow to dry.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Because of the high content of clay, revegetating cut and fill slopes can be difficult.
- The permanent surfacing of roads or the use of suitable subgrade or base material increases soil strength, allows the year-round use of roads, and helps to reduce the damage from frost heaving.
- Intercepting and diverting underground water from seeps and springs helps to stabilize cut and fill slopes.

Lawns and landscaping
Suitability: Poorly suited
Management concerns: Slope, erodibility, high clay content, soil compaction, root disease, pesticide retention, climate, and soil fertility
Management measures and considerations:
- Designing plantings on natural contours helps to increase water infiltration.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Because of the high content of clay, revegetating cut and fill slopes can be difficult.
- The soil is slippery and sticky when wet and slow to dry.
- Avoiding the use of heavy equipment in areas to be landscaped helps to prevent soil compaction.
- Because of the restricted movement of air and water due to the high clay content of the subsoil, phytophthora root disease is a severe limitation for Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- This soil may retain soil-applied herbicides and other pesticides due to the high content of clay. The concentration of pesticides may be damaging to landscape plants.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.

- Using lime, fertilizer, mulch, and irrigation helps to establish lawns and landscape plants.
- Applying large granules or banding of phosphorus helps to overcome phosphorus fixation.
- Topsoil should be stockpiled from disturbed areas and replaced before landscaping.

Interpretive Groups

Land capability classification: 4e

BnC—Braddock-Urban land complex, 2 to 15 percent slopes

Setting

Landscape: Mountain valleys of low mountains and intermountain hills, dominantly along Tallulah, Sweetwater, and Long Creeks near Robbinsville, in the central part of the county
Elevation range: 1,800 to 2,250 feet
Landform: High stream terraces
Landform position: Benches
Shape of areas: Long and narrow or irregular
Size of areas: Up to 72 acres

Map Unit Composition

Braddock soil and similar inclusions: 50 percent
Urban land: 30 percent
Dissimilar inclusions: 20 percent

Typical Profile

Braddock

Surface layer:
0 to 8 inches—yellowish red clay loam

Subsoil:
8 to 34 inches—red clay
34 to 80 inches—red clay loam

Urban land

Urban land consists of areas where 85 percent of the surface is covered with buildings, streets, parking lots, and other impervious material. The natural soils are paved over, covered, or greatly altered by cutting, filling, or grading during the process of urban development. The original landscape, topography, and, commonly, the drainage pattern have been changed. Runoff is very rapid and increases the hazard of flooding in low-lying areas. A typical profile is not given due to the variable nature of the soil. An onsite investigation is needed to determine the suitability and limitations of any area within this map unit.

Properties and Qualities of the Braddock Soil

Depth class: Very deep
Drainage class: Well drained
General texture class: Clayey

Permeability: Moderate in the surface horizon and subsoil and moderately rapid in the underlying material
Available water capacity: High
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Moderate
Slope class: Gently sloping to strongly sloping
Soil slippage potential: None
Extent of erosion: Moderate, about 25 to 75 percent of the original surface layer has been removed
Hazard of water erosion: Severe
Organic matter content of surface layer: Low or moderate
Potential for frost action: Moderate
Special climatic conditions: Soil subject to slow air drainage, which allows late spring and early fall frosts
Soil reaction: Very strongly acid to moderately acid throughout the profile
Parent material: Old alluvium derived from low-grade metasedimentary rock
Depth to bedrock: More than 60 inches
Other distinctive properties: A high content of clay in the subsoil; soil subject to overland flow of storm water from adjacent uplands

Minor Components

Dissimilar inclusions:
- Udorthents, loamy, in and around Robbinsville and other densely populated areas along stream channels
- Random areas of soils on short, steep to nearly vertical slopes
- Moderately well drained to poorly drained soils in depressions and on toeslopes
- Areas that are occasionally or rarely flooded for very brief periods, along stream channels
- Random areas of soils that have less clay in the subsoil and have soft bedrock at a depth of 20 to more than 60 inches
- Thurmont soils that have a water table at a depth of 40 to 60 inches, in depressions, on toeslopes, and in drainageways
- Random areas of moderately well drained to poorly drained soils that have 20 to more than 40 inches of loamy material over strata with a high content of sand and rock fragments, along stream channels
- Random areas of severely eroded soils where underlying material is exposed at the surface
- Random areas of soils on slopes of less than 2 percent or more than 15 percent, on adjacent uplands

Similar inclusions:
- Braddock soils that have surface layers of loam or sandy clay loam

Land Use

Dominant Uses: Building site development

Agricultural Development

Cropland

This map unit is not managed for cropland.

Pasture and hayland

This map unit is not managed for pasture and hayland.

Orchard and ornamental crops

This map unit is not managed for orchard or ornamental crops.

Woodland Management and Productivity

This map unit is not managed for timber production.

Urban Development

Dwellings

Suitability: Suited

Management concerns: Slope, erodibility, high clay content, shrink-swell potential, corrosivity, seeps and springs, and large stones

Management measures and considerations:

- Designing structures on the contour with the natural slope or building in less sloping areas helps to improve soil performance.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Because of the high content of clay, revegetating cut and fill slopes can be difficult.
- The soil is slippery and sticky when wet and slow to dry.
- Reinforcing foundations and footings or backfilling with coarse textured material helps to strengthen buildings and prevents damage caused by shrinking and swelling.
- Using corrosion-resistant materials helps to reduce the risk of damage to uncoated steel and concrete.
- Installing a subsurface drainage system around foundations helps to intercept water from seeps and springs.
- Locating structures away from intermittent and perennial drainageways helps to minimize structural damage from overland flow of storm water.
- Large stones may be encountered during excavation.

Septic tank absorption fields

Suitability: Suited

Management concerns: Restricted permeability, high clay content, slope, seeps and springs, and large stones

Management measures and considerations:

- Contact the local Health Department for guidance on sanitary facilities.
- Avoiding the installation of septic system distribution lines during wet periods helps to minimize the smearing and sealing of trench walls.
- Raking trench walls helps to prevent the sealing of soil pores which may occur during the excavation of septic tank absorption fields.
- Installing distribution lines on the contour helps to improve the performance of septic tank absorption fields.
- Excavations may cut into seeps and springs. These areas should be avoided.
- Large stones may be encountered during excavation.

Local roads and streets

Suitability: Suited

Management concerns: Low strength, high clay content, slope, erodibility, frost action, and seeps and springs

Management measures and considerations:

- Incorporating sand and gravel into the soil, compacting roadbeds, and designing roads that conform to natural slopes help to improve soil strength.
- Using a non-degradable, permeable fabric filter cloth between the roadbed and the soil surface helps to restrict the loss of stone into the soil.
- The soil is slippery and sticky when wet and slow to dry.

- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Because of the high content of clay, revegetating cut and fill slopes can be difficult.
- The permanent surfacing of roads or the use of suitable subgrade or base material increases soil strength, allows the year-round use of roads, and helps to reduce the damage from frost heaving.
- Intercepting and diverting underground water from seeps and springs helps to stabilize cut and fill slopes.

Lawns and landscaping
Suitability: Suited
Management concerns: Slope, erodibility, high clay content, soil compaction, root disease, pesticide retention, climate, and soil fertility
Management measures and considerations:
- Designing plantings on natural contours helps to increase water infiltration.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Because of the high content of clay, revegetating cut and fill slopes can be difficult.
- The soil is slippery and sticky when wet and slow to dry.
- Avoiding the use of heavy equipment in areas to be landscaped helps to prevent soil compaction.
- Because of the restricted movement of air and water due to the high clay content of the subsoil, phytophthora root disease is a severe limitation for Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- The Braddock soil may retain soil-applied herbicides and other pesticides due to the high content of clay. The concentration of pesticides may be damaging to landscape plants.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.
- Using lime, fertilizer, mulch, and irrigation helps to establish lawns and landscape plants.
- Applying large granules or banding of phosphorus helps to overcome phosphorus fixation.
- Topsoil should be stockpiled from disturbed areas and replaced before landscaping.

Interpretive Groups

Land capability classification: Braddock—3e; Urban land—8s

BuC—Breakneck-Pullback complex, windswept, 8 to 15 percent slopes, very rocky

Setting

Landscape: High mountains, near Bob Stratton Bald, Hooper Bald, Huckleberry Knob, and Laurel Top in the western part of the county
Elevation range: 4,700 to 5,560 feet
Landform: Ridges
Landform position: Summits

Shape of areas: Irregular
Size of areas: Up to 30 acres

Map Unit Composition

Breakneck soil and similar inclusions: 45 percent
Pullback soil and similar inclusions: 40 percent
Rock outcrop: 5 percent
Dissimilar inclusions: 10 percent

Typical Profile

Breakneck

Surface layer:
0 to 3 inches—moderately decomposed plant material
3 to 12 inches—black channery loam

Subsoil:
12 to 28 inches—dark yellowish brown channery loam

Bedrock:
28 to 80 inches—unweathered, hard metasandstone

Pullback

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 8 inches—very dark brown sandy loam

Subsoil:
8 to 16 inches—dark yellowish brown sandy loam

Bedrock:
16 to 80 inches—unweathered, hard metasandstone

Soil Properties and Qualities

Depth class: Breakneck—moderately deep; Pullback—shallow
Drainage class: Well drained
General texture class: Loamy
Permeability: Moderate or moderately rapid
Available water capacity: Breakneck—low; Pullback—very low
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Strongly sloping
Soil slippage potential: Breakneck—medium; Pullback—high
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Severe
Rock fragments on the surface: About 3 percent flagstones and stones that average about 6 to 24 inches in length and are about 3 to 25 feet apart
Extent of Rock outcrop: About 5 percent of the soil surface
Organic matter content of surface layer: Very high
Potential for frost action: Moderate
Special climatic conditions: Soils subject to prolonged freezing temperatures and rime ice in winter, high winds, high rainfall, and a short growing season

Soil reaction: Extremely acid to strongly acid throughout the profile
Parent material: Residuum weathered from low-grade metasedimentary rock, such as metasandstone and phyllite
Depth to bedrock: Breakneck—20 to 40 inches; Pullback—10 to 20 inches to hard bedrock
Other distinctive properties: Water movement along bedrock contacts

Minor Components

Dissimilar inclusions:
- Soils that have hard bedrock at a depth of less than 10 or more than 40 inches, adjacent to rock outcrops
- Heintooga soils that have more rock fragments in the subsoil, below rock outcrops and in drainageways
- Chiltoskie soils that have loamy subsoils and bedrock at a depth of more than 60 inches, in concave areas at the head of drains and in saddles and gaps
- Random areas of soils on slopes of less than 8 percent or more than 15 percent

Similar inclusions:
- Breakneck soils that have surface layers of fine sandy loam or sandy loam
- Pullback soils that have surface layers of fine sandy loam or loam
- Random areas of similar soils that have bedrock at a depth of 40 to 60 inches

Land Use

Dominant Uses: Pasture and wildlife habitat
Other Uses: Recreation

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, damaging high winds, short growing season, extent of rock outcrops, and very stony surface. A site should be selected on better suited soils.

Pasture and hayland
Suitability: Poorly suited
Management concerns: Equipment use, erodibility, climate, pesticide retention, soil fertility, rooting depth, and droughtiness
Management measures and considerations:
- The slope, erodibility, very stony surface, damaging high winds, and short growing season are limitations affecting pasture and hayland. A site should be selected on better suited soils.
- Growing adapted plants helps to ensure the production of high-quality forage and minimize soil erosion.
- These soils may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.

- Using rotational grazing, implementing a well planned harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.
- Because of the low available water capacity due to the moderately deep and shallow rooting depths, these soils are difficult to manage for the production of pasture and hay crops.

Orchard and ornamental crops
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for orchard and ornamental crops because of the slope, damaging high winds, short growing season, erodibility, extent of rock outcrops, and very stony surface. A site should be selected on better suited soils.

Woodland Management and Productivity

Potential for commercial species: Very low
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for timber production because of the damaging high winds, short growing season, low productivity, depth to bedrock, extent of rock outcrops, and very stony surface. A site should be selected on better suited soils.

Urban Development

Dwellings
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for dwellings because of the slope, erodibility, damaging high winds, prolonged freezing temperatures, depth to bedrock, extent of rock outcrops, and very stony surface. A site should be selected on better suited soils.

Septic tank absorption fields
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for septic tank absorption fields because of the slope, prolonged freezing temperatures, depth to bedrock, extent of rock outcrops, and very stony surface. A site should be selected on better suited soils.

Local roads and streets
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for roads and streets because of the slope, erodibility, depth to bedrock, extent of rock outcrops, and very stony surface. A site should be selected on better suited soils.

Lawns and landscaping
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for lawns and landscaping because of the slope, erodibility, damaging high winds, short growing season, depth to bedrock, extent of rock outcrops, and very stony surface. A site should be selected on better suited soils.

Interpretive Groups

Land capability classification: Breakneck—4s; Pullback—7s

Figure 11.—A high mountain grassy bald on Huckleberry Knob in an area of Breakneck-Pullback complex, windswept, 15 to 30 percent slopes, very rocky. Areas such as this are highly desirable for wildlife and were once used as summer pasture.

BuD—Breakneck-Pullback complex, windswept, 15 to 30 percent slopes, very rocky

Setting

Landscape: High mountains, near Bob Stratton Bald, Hooper Bald, Huckleberry Knob, and Laurel Top in the western part of the county (fig. 11)
Elevation range: 4,450 to 5,560 feet
Landform: Ridges and mountain slopes
Landform position: Summits and side slopes
Shape of areas: Irregular
Size of areas: Up to 158 acres

Map Unit Composition

Breakneck soil and similar inclusions: 65 percent
Pullback soil and similar inclusions: 15 percent
Rock outcrop: 5 percent
Dissimilar inclusions: 15 percent

Typical Profile

Breakneck

Surface layer:
0 to 3 inches—moderately decomposed plant material
3 to 12 inches—black channery loam

Subsoil:
12 to 28 inches—dark yellowish brown channery loam

Bedrock:
28 to 80 inches—unweathered, hard metasandstone

Pullback

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 8 inches—very dark brown sandy loam

Subsoil:
8 to 16 inches—dark yellowish brown sandy loam

Bedrock:
16 to 80 inches—unweathered, hard metasandstone

Soil Properties and Qualities

Depth class: Breakneck—moderately deep; Pullback—shallow
Drainage class: Well drained
General texture class: Loamy
Permeability: Moderate or moderately rapid
Available water capacity: Breakneck—low; Pullback—very low
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Moderately steep
Soil slippage potential: Breakneck—medium; Pullback—high
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: Widely scattered stones and boulders that average about 15 to 48 inches in length and are about 25 to 75 feet apart
Extent of Rock outcrop: About 5 percent of the soil surface
Organic matter content of surface layer: Very high
Potential for frost action: Moderate
Special climatic conditions: Soils subject to prolonged freezing temperatures and rime ice in winter, high winds, high rainfall, and a short growing season
Soil reaction: Extremely acid to strongly acid throughout the profile
Parent material: Residuum weathered from low-grade metasedimentary rock, such as metasandstone and phyllite
Depth to bedrock: Breakneck—20 to 40 inches; Pullback—10 to 20 inches to hard bedrock
Other distinctive properties: Water movement along bedrock contacts

Minor Components

Dissimilar inclusions:
- Soils that have hard bedrock at a depth of less than 10 or more than 40 inches, adjacent to rock outcrops
- Heintooga soils that have more rock fragments in the subsoil, below rock outcrops and in drainageways
- Chiltoskie soils that have loamy subsoils and have bedrock at a depth of more than 60 inches, in concave areas at the head of drains, in drainageways, on benches, on footslopes, in saddles, and in gaps
- Random areas of soils on slopes of less than 15 percent or more than 30 percent

Similar inclusions:
- Breakneck soils that have surface layers of fine sandy loam or sandy loam
- Pullback soils that have surface layers of fine sandy loam or sandy loam
- Random areas of similar soils that have bedrock at a depth of 40 to 60 inches

Land Use

Dominant Uses: Wildlife habitat and recreation

Agricultural Development

Cropland

Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, damaging high winds, short growing season, extent of rock outcrops, and very stony surface. A site should be selected on better suited soils.

Pasture and hayland

Suitability: Pasture—poorly suited; hayland—unsuited
Management concerns: Equipment use, erodibility, climate, pesticide retention, soil fertility, rooting depth, and droughtiness
Management measures and considerations:
- The slope, erodibility, very stony surface, damaging high winds, and short growing season are limitations affecting pasture and hayland. A site should be selected on better suited soils.
- The slope limits the use of equipment in the steeper areas.
- Growing adapted plants helps to ensure the production of high-quality forage and minimize soil erosion.
- These soils may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using rotational grazing, implementing a well planned harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.
- Because of the low available water capacities due to the moderately deep and shallow rooting depths, these soils are difficult to manage for the production of pasture and hay crops.

Orchard and ornamental crops

Suitability: Unsuited
Management concerns:
- This map unit is severely limited for orchard and ornamental crops because of the slope, damaging high winds, short growing season, erodibility, extent of rock outcrops, and very stony surface. A site should be selected on better suited soils.

Woodland Management and Productivity

Potential for commercial species: Very low
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for timber production because of the damaging high winds, short growing season, low productivity, depth to bedrock, extent of rock outcrops, and very stony surface. A site should be selected on better suited soils.

Urban Development

Dwellings

Suitability: Unsuited

Management concerns:
- This map unit is severely limited for dwellings because of the slope, erodibility, climate, corrosivity, depth to bedrock, extent of rock outcrops, and very stony surface. A site should be selected on better suited soils.

Septic tank absorption fields
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for septic tank absorption fields because of the slope, prolonged freezing temperatures, depth to bedrock, extent of rock outcrops, and very stony surface. A site should be selected on better suited soils.

Local roads and streets
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for roads and streets because of the slope, erodibility, climate, corrosivity, depth to bedrock, extent of rock outcrops, and very stony surface. A site should be selected on better suited soils.

Lawns and landscaping
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for lawns and landscaping because of the slope, erodibility, climate, corrosivity, depth to bedrock, extent of rock outcrops, and very stony surface. A site should be selected on better suited soils.

Interpretive Groups

Land capability classification: Breakneck—4s; Pullback—7s

BuE—Breakneck-Pullback complex, windswept, 30 to 50 percent slopes, very rocky

Setting

Landscape: High mountains, near Bob Stratton Bald, Hooper Bald, Huckleberry Knob, and Laurel Top in the western part of the county
Elevation range: 4,450 to 5,530 feet
Landform: Ridges and mountain slopes
Landform position: Summits and side slopes
Shape of areas: Irregular
Size of areas: Up to 383 acres

Map Unit Composition

Breakneck soil and similar inclusions: 55 percent
Pullback soil and similar inclusions: 30 percent
Rock outcrop: 5 percent
Dissimilar inclusions: 10 percent

Typical Profile

Breakneck

Surface layer:
0 to 3 inches—moderately decomposed plant material
3 to 12 inches—black channery loam

Subsoil:
12 to 28 inches—dark yellowish brown channery loam

Bedrock:
28 to 80 inches—unweathered, hard metasandstone

Pullback

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 8 inches—very dark brown sandy loam

Subsoil:
8 to 16 inches—dark yellowish brown sandy loam

Bedrock:
16 to 80 inches—unweathered, hard metasandstone

Soil Properties and Qualities

Depth class: Breakneck—moderately deep; Pullback—shallow
Drainage class: Well drained
General texture class: Loamy
Permeability: Moderate or moderately rapid
Available water capacity: Breakneck—low; Pullback—very low
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Steep
Soil slippage potential: Breakneck—medium; Pullback—high
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: About 3 percent stones and boulders that average about 15 to 48 inches in length and are about 10 to 65 feet apart
Extent of Rock outcrop: About 5 percent of the soil surface
Organic matter content of surface layer: Very high
Potential for frost action: Moderate
Special climatic conditions: Soils subject to prolonged freezing temperatures and rime ice in winter, high winds, high rainfall, and a short growing season
Soil reaction: Extremely acid to strongly acid throughout the profile
Parent material: Residuum affected by soil creep in the upper part, weathered from low-grade metasedimentary rock, such as metasandstone and phyllite
Depth to bedrock: Breakneck—20 to 40 inches; Pullback—10 to 20 inches to hard bedrock
Other distinctive properties: Water movement along bedrock contacts; soils subject to downslope movement when lateral support is removed

Minor Components

Dissimilar inclusions:
- Soils that have hard bedrock at a depth of less than 10 or more than 40 inches, adjacent to rock outcrops
- Heintooga soils that have more rock fragments in the subsoil, below rock outcrops and in drainageways
- Chiltoskie soils that have loamy subsoils and have bedrock at a depth of more than 60 inches, in concave areas at the head of drains, in drainageways, on benches, and on footslopes

- Random areas of soils on slopes of less than 30 percent or more than 50 percent
- Jeffrey and Cheoah soils that have bedrock at a depth of 20 to 60 inches and are in the warmer mesic soil temperature regime at the lower elevations in the map unit

Similar inclusions:
- Breakneck soils that have surface layers of fine sandy loam or sandy loam
- Pullback soils that have surface layers of fine sandy loam or loam
- Random areas of similar soils that have bedrock at a depth of 40 to 60 inches

Land Use

Dominant Uses: Wildlife habitat and recreation

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, damaging high winds, short growing season, extent of rock outcrops, and very bouldery surface. A site should be selected on better suited soils.

Pasture and hayland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for the production of pasture and hay crops because of the slope, erodibility, damaging high winds, short growing season, extent of rock outcrops, and very bouldery surface. A site should be selected on better suited soils.

Orchard and ornamental crops
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for orchard and ornamental crops because of the slope, damaging high winds, short growing season, erodibility, extent of rock outcrops, and very bouldery surface. A site should be selected on better suited soils.

Woodland Management and Productivity

Potential for commercial species: Very low
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for timber production because of the damaging high winds, short growing season, low productivity, depth to bedrock, and very bouldery surface. A site should be selected on better suited soils.

Urban Development

Dwellings
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for dwellings because of the slope, erodibility, damaging high winds, prolonged freezing temperatures, depth to bedrock, extent of rock outcrops, and very bouldery surface. A site should be selected on better suited soils.

Septic tank absorption fields
Suitability: Unsuited

Management concerns:
- This map unit is severely limited for septic tank absorption fields because of the slope, prolonged freezing temperatures, depth to bedrock, extent of rock outcrops, and very bouldery surface. A site should be selected on better suited soils.

Local roads and streets
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for roads and streets because of the slope, erodibility, depth to bedrock, extent of rock outcrops, and very bouldery surface. A site should be selected on better suited soils.

Lawns and landscaping
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for lawns and landscaping because of the slope, erodibility, damaging high winds, short growing season, depth to bedrock, extent of rock outcrops, and very bouldery surface. A site should be selected on better suited soils.

Interpretive Groups

Land capability classification: 7s

BuF—Breakneck-Pullback complex, windswept, 50 to 95 percent slopes, very rocky

Setting

Landscape: High mountains, near Bob Stratton Bald, Hooper Bald, Huckleberry Knob, and Laurel Top in the western part of the county
Elevation range: 4,400 to 5,450 feet
Landform: Mountain slopes
Landform position: Side slopes
Shape of areas: Irregular
Size of areas: Up to 43 acres

Map Unit Composition

Breakneck soil and similar inclusions: 55 percent
Pullback soil and similar inclusions: 30 percent
Rock outcrop: 5 percent
Dissimilar inclusions: 10 percent

Typical Profile

Breakneck

Surface layer:
0 to 3 inches—moderately decomposed plant material
3 to 12 inches—black channery loam

Subsoil:
12 to 28 inches—dark yellowish brown channery loam

Bedrock:
28 to 80 inches—unweathered, hard metasandstone

Pullback

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 8 inches—very dark brown sandy loam

Subsoil:
8 to 16 inches—dark yellowish brown sandy loam

Bedrock:
16 to 80 inches—unweathered, hard metasandstone

Soil Properties and Qualities

Depth class: Breakneck—moderately deep; Pullback—shallow
Drainage class: Well drained
General texture class: Loamy
Permeability: Moderate or moderately rapid
Available water capacity: Breakneck—low; Pullback—very low
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Very steep
Soil slippage potential: Breakneck—medium; Pullback—high
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: About 3 percent stones and boulders that average about 15 to 48 inches in length and are about 10 to 65 feet apart
Extent of Rock outcrop: About 5 percent of the soil surface
Organic matter content of surface layer: Very high
Potential for frost action: Moderate
Special climatic conditions: Soils subject to prolonged freezing temperatures and rime ice in winter, high winds, high rainfall, and a short growing season
Soil reaction: Extremely acid to strongly acid throughout the profile
Parent material: Residuum affected by soil creep in the upper part, weathered from low-grade metasedimentary rock, such as metasandstone and phyllite
Depth to bedrock: Breakneck—20 to 40 inches; Pullback—10 to 20 inches to hard bedrock
Other distinctive properties: Water movement along bedrock contacts; soils subject to downslope movement when lateral support is removed

Minor Components

Dissimilar inclusions:
- Soils that have hard bedrock at a depth of less than 10 or more than 40 inches, adjacent to rock outcrops
- Heintooga soils that have more rock fragments in the subsoil, below rock outcrops and in drainageways
- Chiltoskie soils that have loamy subsoils and have bedrock at a depth of more than 60 inches, in concave areas at the head of drains, in drainageways, on benches, and on footslopes
- Random areas of soils on slopes of less than 50 percent or more than 95 percent
- Jeffrey and Cheoah soils that have bedrock at a depth of 20 to 60 inches and are in the warmer mesic soil temperature regime at the lower elevations in the map unit

Similar inclusions:
- Breakneck soils that have surface layers of fine sandy loam or sandy loam

- Pullback soils that have surface layers of fine sandy loam or loam
- Random areas of similar soils that have bedrock at a depth of 40 to 60 inches

Land Use

Dominant Uses: Wildlife habitat

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, damaging high winds, short growing season, extent of rock outcrops, and very bouldery surface. A site should be selected on better suited soils.

Pasture and hayland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for the production of pasture and hay crops because of the slope, erodibility, damaging high winds, short growing season, extent of rock outcrops, and very bouldery surface. A site should be selected on better suited soils.

Orchard and ornamental crops
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for orchard and ornamental crops because of the slope, damaging high winds, short growing season, erodibility, extent of rock outcrops, and very bouldery surface. A site should be selected on better suited soils.

Woodland Management and Productivity

Potential for commercial species: Very low
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for timber production because of the damaging high winds, short growing season, low productivity, depth to bedrock, and very bouldery surface. A site should be selected on better suited soils.

Urban Development

Dwellings
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for dwellings because of the slope, erodibility, damaging high winds, prolonged freezing temperatures, depth to bedrock, extent of rock outcrops, and very bouldery surface. A site should be selected on better suited soils.

Septic tank absorption fields
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for septic tank absorption fields because of the slope, prolonged freezing temperatures, depth to bedrock, extent of rock outcrops, and very bouldery surface. A site should be selected on better suited soils.

Local roads and streets
Suitability: Unsuited

Management concerns:
- This map unit is severely limited for roads and streets because of the slope, erodibility, depth to bedrock, extent of rock outcrops, and very bouldery surface. A site should be selected on better suited soils.

Lawns and landscaping
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for lawns and landscaping because of the slope, erodibility, damaging high winds, short growing season, depth to bedrock, extent of rock outcrops, and very bouldery surface. A site should be selected on better suited soils.

Interpretive Groups

Land capability classification: 7s

ChE—Cheoah channery loam, 30 to 50 percent slopes, stony

Setting

Landscape: Intermediate mountains throughout the county
Elevation range: 1,960 to 4,490 feet
Landform: North- to east-facing ridges and mountain slopes and those slopes shaded by the higher mountains
Landform position: Summits and side slopes
Shape of areas: Long and narrow on summits and irregular on side slopes
Size of areas: Up to 112 acres

Map Unit Composition

Cheoah soil and similar inclusions: 80 percent
Dissimilar inclusions: 20 percent

Typical Profile

Surface layer:
0 to 2 inches—moderately decomposed plant material
2 to 8 inches—very dark grayish brown channery loam
8 to 14 inches—dark brown channery loam

Subsoil:
14 to 40 inches—yellowish brown loam

Underlying material:
40 to 55 inches—yellowish brown channery fine sandy loam saprolite

Bedrock:
55 to 80 inches—weathered, interbedded metasandstone and phyllite

Soil Properties and Qualities

Depth class: Deep
Drainage class: Well drained
General texture class: Loamy
Permeability: Moderately rapid
Available water capacity: Moderate
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None

Shrink-swell potential: Low
Slope class: Steep
Soil slippage potential: Low
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: Widely scattered flagstones and stones that average about 6 to 24 inches in length and are about 25 to 75 feet apart
Organic matter content of surface layer: High or very high
Potential for frost action: Moderate
Special climatic conditions: Soil subject to cooler annual air temperatures, which allow late spring and early fall frosts, and higher soil moisture content due to north- to east-facing aspects or shading by the higher mountains
Soil reaction: Extremely acid to strongly acid throughout the A horizon; extremely acid to moderately acid in the other horizons
Parent material: Residuum affected by soil creep in the upper part, weathered from low-grade metasedimentary rock
Depth to bedrock: 40 to 60 inches to soft bedrock
Other distinctive properties: Soil subject to downslope movement when lateral support is removed and to differential settling when used as fill material

Minor Components

Dissimilar inclusions:
- Jeffrey soils that have bedrock at a depth of 20 to 40 inches, on north- to east-facing mountain slopes
- Spivey soils that have more rock fragments in the subsoil and have bedrock at a depth of more than 60 inches, in drainageways and below rock outcrops
- Whiteoak and Santeetlah soils that have bedrock at a depth of more than 60 inches, in concave areas at the head of drains and on footslopes
- Soco and Stecoah soils that have thinner surface layers with less organic matter and have soft bedrock at a depth of 20 to 60 inches, on south- to west-facing shoulder slopes and nose slopes
- Ditney and Unicoi soils that have thinner surface layers with less organic matter and have hard bedrock at a depth of 7 to 40 inches, on south- to west-facing shoulder slopes and nose slopes
- Random areas of soils that have bedrock at a depth of less than 40 or more than 60 inches
- Random areas of soils on slopes of less than 30 percent or more than 50 percent
- Prominent ridges and upper side slopes that are subject to frequent rime ice in winter and high winds year-round

Similar inclusions:
- Cheoah soils that have surface layers of sandy loam or fine sandy loam

Land Use

Dominant Uses: Woodland and wildlife habitat
Other Uses: Recreation, pasture, and building site development

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, depth to bedrock, and stony surface. A site should be selected on better suited soils.

Pasture and hayland

Suitability: Pasture—poorly suited; hayland—unsuited
Management concerns: Equipment use, erodibility, pesticide retention, and soil fertility
Management measures and considerations:

- Because of the slope, this map unit is difficult to manage for pasture and hayland.
- Growing adapted plants helps to ensure the production of high-quality forage and minimize soil erosion.
- This soil may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using rotational grazing and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.

Orchard and ornamental crops

Suitability: Poorly suited
Management concerns: Equipment use, erodibility, pesticide retention, ball and burlap harvesting, plant shape, climate, and soil fertility
Management measures and considerations:

- This soil may be difficult to manage for orchard or ornamental crops because the slope limits equipment use.
- This soil may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Avoiding ball and burlap harvesting during dry periods helps to prevent fracture of the ball and separation of the soil from the roots caused by a low moisture content and a minimal clay content.
- The slope affects the shape of ornamentals on the uphill side.
- Due to the cooler air temperatures associated with the north- to east-facing aspects of this map unit, late spring frost may damage new growth in some years.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximize productivity.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.

Woodland Management and Productivity

Potential for commercial species: Moderately high for cove hardwoods and northern hardwoods
Suitability: Suited
Management concerns: Equipment use, erodibility, and pesticide retention
Management measures and considerations:

- Using cable logging methods helps to minimize road and trail construction, especially in areas where slope exceeds 40 percent.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.

- When the soil is wet, skid trails and unsurfaced roads are highly erodible and very slick due to the slope and the high content of organic matter in the surface layer.
- Avoiding logging operations during periods when the soil is saturated helps to prevent rutting of the soil surface and damage to tree roots due to soil compaction.
- Blasting, shaping, and grading are needed if roads are to be constructed on the contour.
- Leaving a buffer zone of trees and shrubs adjacent to streams helps to minimize siltation and provides shade for the aquatic habitat.
- Livestock should not be allowed to graze in areas managed for woodland.

Urban Development

Dwellings
Suitability: Poorly suited
Management concerns: Slope, depth to bedrock, erodibility, and corrosivity
Management measures and considerations:
- Designing structures on the contour with the natural slope or building in less sloping areas helps to improve soil performance.
- Drilling and blasting of rock or special earth-moving equipment is needed to increase the depth of this soil.
- Vegetating cleared and graded areas as soon as possible or constructing silt fences helps to maintain soil stability and prevents sediments from leaving the site.
- Using corrosion-resistant materials helps to reduce the risk of damage to concrete.

Septic tank absorption fields
Suitability: Poorly suited
Management concerns: Depth to bedrock and slope
Management measures and considerations:
- Contact the local Health Department for guidance on sanitary facilities.
- Locating and using areas of deeper soils within this map unit may improve the performance of filter fields.
- Installing distribution lines on the contour helps to improve the performance of septic tank absorption fields.

Local roads and streets
Suitability: Poorly suited
Management concerns: Slope, erodibility, depth to bedrock, frost action, and seeps and springs
Management measures and considerations:
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Blasting, shaping, and grading are needed if roads are to be constructed on the contour.
- The permanent surfacing of roads or the use of suitable subgrade or base material allows the year-round use of roads and helps to reduce the damage from frost heaving.
- Intercepting and diverting underground water from seeps and springs helps to stabilize cut and fill slopes.

Lawns and landscaping
Suitability: Poorly suited
Management concerns: Slope, erodibility, pesticide retention, soil fertility, and climate
Management measures and considerations:
- Designing plantings on natural contours helps to increase water infiltration.

- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- This soil may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to landscape plants.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Using lime, fertilizer, mulch, and irrigation helps to establish lawns and landscape plants.
- Topsoil should be stockpiled from disturbed areas and replaced before landscaping.
- The use of native, winter-hardy landscape plants is recommended.
- Due to the cooler air temperatures associated with the north- to east-facing aspects of this map unit, late spring frost may damage new growth in some years.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.

Interpretive Groups

Land capability classification: 6e

ChF—Cheoah channery loam, 50 to 95 percent slopes, stony

Setting

Landscape: Intermediate mountains throughout the county
Elevation range: 2,010 to 4,260 feet
Landform: North- to east-facing ridges and mountain slopes and those shaded by the higher mountains
Landform position: Side slopes
Shape of areas: Irregular
Size of areas: Up to 151 acres

Map Unit Composition

Cheoah soil and similar inclusions: 80 percent
Dissimilar inclusions: 20 percent

Typical Profile

Surface layer:
0 to 2 inches—moderately decomposed plant material
2 to 8 inches—very dark grayish brown channery loam
8 to 14 inches—dark brown channery loam

Subsoil:
14 to 40 inches—yellowish brown loam

Underlying material:
40 to 55 inches—yellowish brown channery fine sandy loam saprolite

Bedrock:
55 to 80 inches—weathered, interbedded metasandstone and phyllite

Soil Properties and Qualities

Depth class: Deep
Drainage class: Well drained

General texture class: Loamy
Permeability: Moderately rapid
Available water capacity: Moderate
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Very steep
Soil slippage potential: Low
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: Widely scattered flagstones and stones that average about 6 to 24 inches in length and are about 25 to 75 feet apart
Organic matter content of surface layer: High or very high
Potential for frost action: Moderate
Special climatic conditions: Soil subject to cooler annual air temperatures, which allow late spring and early fall frosts, and higher soil moisture content due to north- to east-facing aspects or shading by the higher mountains
Soil reaction: Extremely acid to strongly acid throughout the A horizon; extremely acid to moderately acid in the other horizons
Parent material: Residuum affected by soil creep in the upper part, weathered from low-grade metasedimentary rock
Depth to bedrock: 40 to 60 inches to soft bedrock
Other distinctive properties: Soil subject to downslope movement when lateral support is removed and to differential settling when used as fill material

Minor Components

Dissimilar inclusions:
- Jeffrey soils that have bedrock at a depth of 20 to 40 inches, on north- to east-facing mountain slopes
- Spivey soils that have more rock fragments in the subsoil and have bedrock at a depth of more than 60 inches, in drainageways and below rock outcrops
- Santeetlah soils that have bedrock at a depth of more than 60 inches, in concave areas at the head of drains and on footslopes
- Ditney and Unicoi soils that have thinner surface layers with less organic matter and have hard bedrock at a depth of 7 to 40 inches, on south- to west-facing shoulder slopes and nose slopes
- Soco and Stecoah soils that have thinner surface layers with less organic matter and have soft bedrock at a depth of 20 to 60 inches, on south- to west-facing shoulder slopes and nose slopes
- Random areas of soils that have bedrock at a depth of less than 40 or more than 60 inches
- Random areas of soils on slopes of less than 50 percent or more than 95 percent
- Widely scattered areas of rock outcrop
- Prominent ridges and upper side slopes that are subject to frequent rime ice in winter and high winds year-round

Similar inclusions:
- Cheoah soils that have surface layers of sandy loam or fine sandy loam

Land Use

Dominant Uses: Woodland and wildlife habitat
Other Uses: Recreation

Agricultural Development

Cropland

Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, depth to bedrock, and stony surface. A site should be selected on better suited soils.

Pasture and hayland

Suitability: Unsuited
Management concerns:
- This map unit is severely limited for the production of pasture and hay crops because of the slope and stony surface. A site should be selected on better suited soils.

Orchard and ornamental crops

Suitability: Unsuited
Management concerns:
- This map unit is severely limited for orchard and ornamental crops because of the slope, erodibility, and stony surface. A site should be selected on better suited soils.

Woodland Management and Productivity

Potential for commercial species: Moderately high for cove hardwoods and northern hardwoods
Suitability: Poorly suited
Management concerns: Equipment use, erodibility, and pesticide retention
Management measures and considerations:
- Using cable logging methods helps to overcome the equipment limitation and prevents the acceleration of erosion caused by road construction, skid trails, and disturbance of the forest floor by heavy machinery.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.
- When the soil is wet, skid trails and unsurfaced roads are highly erodible and very slick due to the slope and the clay content of the subsoil.
- Avoiding logging operations during periods when the soil is saturated helps to prevent rutting of the soil surface and damage to tree roots due to soil compaction.
- Leaving a buffer zone of trees and shrubs adjacent to streams helps to minimize siltation and provides shade for the aquatic habitat.
- Livestock should not be allowed to graze in areas managed for woodland.

Urban Development

Dwellings

Suitability: Unsuited
Management concerns:
- This map unit is severely limited for dwellings because of the slope, erodibility, and stony surface. A site should be selected on better suited soils.

Septic tank absorption fields

Suitability: Unsuited

Management concerns:
- This map unit is severely limited for septic tank absorption fields because of the slope, depth to bedrock, and stony surface. Contact the local Health Department for additional guidance.

Local roads and streets
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for roads and streets because of the slope and erodibility. A site should be selected on better suited soils.

Lawns and landscaping
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for lawns and landscaping because of the slope, erodibility, depth to bedrock, and stony surface. A site should be selected on better suited soils.

Interpretive Groups

Land capability classification: 7e

CrD—Cheoah-Jeffrey complex, 15 to 30 percent slopes, rocky

Setting

Landscape: Intermediate mountains in the western part of the county
Elevation range: 2,510 to 5,000 feet
Landform: North- to east-facing ridges and those ridges shaded by the higher mountains
Landform position: Summits and upper side slopes
Shape of areas: Long and narrow
Size of areas: Up to 175 acres

Map Unit Composition

Cheoah soil and similar inclusions: 65 percent
Jeffrey soil and similar inclusions: 30 percent
Rock outcrop: 2 percent
Dissimilar inclusions: 3 percent

Typical Profile

Cheoah

Surface layer:
0 to 2 inches—moderately decomposed plant material
2 to 8 inches—very dark grayish brown channery loam
8 to 14 inches—dark brown channery loam

Subsoil:
14 to 40 inches—yellowish brown loam

Underlying material:
40 to 55 inches—yellowish brown channery fine sandy loam saprolite

Bedrock:
55 to 80 inches—weathered, interbedded metasandstone and phyllite

Jeffrey

Surface layer:
0 to 3 inches—very dark grayish brown channery loam
3 to 8 inches—dark brown channery loam

Subsoil:
8 to 13 inches—brown channery loam
13 to 27 inches—dark yellowish brown channery loam

Underlying material:
27 to 34 inches—brown channery sandy loam

Bedrock:
34 to 80 inches—unweathered, hard, arkosic metasandstone

Soil Properties and Qualities

Depth class: Cheoah—deep; Jeffrey—moderately deep
Drainage class: Well drained
General texture class: Loamy
Permeability: Moderately rapid
Available water capacity: Cheoah—moderate; Jeffrey—low
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Moderately steep
Soil slippage potential: Low
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: Widely scattered flagstones and stones that average about 6 to 24 inches in length and are about 25 to 75 feet apart
Extent of Rock outcrop: About 2 percent of the soil surface
Organic matter content of surface layer: High or very high
Potential for frost action: Moderate
Special climatic conditions: Soils subject to cooler annual air temperatures, which allow late spring and early fall frosts, and higher soil moisture content due to north- to east-facing aspects or shading by the higher mountains
Soil reaction: Extremely acid to strongly acid throughout the profile
Parent material: Residuum weathered from low-grade metasedimentary rock
Depth to bedrock: Cheoah—40 to 60 inches to soft bedrock; Jeffrey—20 to 40 inches to hard bedrock
Other distinctive properties: Water movement along bedrock contacts in areas of the Jeffrey soil

Minor Components

Dissimilar inclusions:
- Spivey soils that have more rock fragments in the subsoil and have bedrock at a depth of more than 60 inches, in drainageways and below rock outcrops
- Santeetlah soils that have bedrock at a depth of more than 60 inches, in concave areas at the head of drains and on footslopes
- Ditney and Unicoi soils that have thinner surface layers with less organic matter and have hard bedrock at a depth of 7 to 40 inches, on south- to west-facing shoulder slopes and nose slopes

- Soco and Stecoah soils that have thinner surface layers with less organic matter and have soft bedrock at a depth of 20 to 60 inches, on south- to west-facing shoulder slopes and nose slopes
- Random areas of soils that have bedrock at a depth of more than 60 inches
- Random areas of soils on slopes of less than 15 percent or more than 30 percent
- Prominent ridges and upper side slopes that are subject to frequent rime ice in winter and high winds year-round

Similar inclusions:
- Cheoah and Jeffrey soils that have surface layers of sandy loam or fine sandy loam

Land Use

Dominant Uses: Woodland and wildlife habitat
Other Uses: Recreation, pasture, and building site development

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, depth to bedrock, and stony surface. A site should be selected on better suited soils.

Pasture and hayland
Suitability: Suited
Management concerns: Cheoah—equipment use, erodibility, pesticide retention, soil fertility, and rooting depth; Jeffrey—equipment use, erodibility, pesticide retention, soil fertility, rooting depth, and droughtiness
Management measures and considerations:
- The slope limits the use of equipment in the steeper areas.
- Growing adapted plants helps to ensure the production of high-quality forage and minimize soil erosion.
- These soils may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using rotational grazing, implementing a well planned harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.
- Because of the low available water capacity due to the moderately deep rooting depth, the Jeffrey soil is difficult to manage for the production of pasture and hay crops.

Orchard and ornamental crops
Suitability: Cheoah—suited; Jeffrey—poorly suited
Management concerns: Cheoah—equipment use, erodibility, pesticide retention, ball and burlap harvesting, plant shape, climate, soil fertility, and rooting depth; Jeffrey—equipment use, erodibility, pesticide retention, ball and burlap harvesting, plant shape, climate, soil fertility, rooting depth, and droughtiness
Management measures and considerations:
- These soils may be difficult to manage for orchard or ornamental crops because the slope limits equipment use.

- Establishing and maintaining sod between rows and on access roads helps to reduce the hazard of erosion.
- These soils may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Avoiding ball and burlap harvesting during dry periods helps to prevent fracture of the ball and separation of the soil from the roots caused by a low moisture content and a minimal clay content.
- The slope affects the shape of ornamentals on the uphill side.
- Due to the cooler air temperatures associated with the north- to east-facing aspects of this map unit, late spring frost may damage new growth in some years.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximize productivity.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of the low available water capacity and windthrow hazard due to the moderately deep rooting depth, the Jeffrey soil is difficult to manage for orchard and ornamental crops.

Woodland Management and Productivity

Potential for commercial species: Moderately high for cove hardwoods and northern hardwoods
Suitability: Suited
Management concerns: Cheoah—erodibility, equipment use, and pesticide retention; Jeffrey—erodibility, equipment use, pesticide retention, and windthrow hazard
Management measures and considerations:
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.
- When the soil is wet, skid trails and unsurfaced roads are highly erodible and very slick due to the slope and the high content of organic matter in the surface layer.
- Avoiding logging operations during periods when the soil is saturated helps to prevent rutting of the soil surface and damage to tree roots due to soil compaction.
- Blasting, shaping, and grading are needed if roads are to be constructed on the contour.
- Livestock should not be allowed to graze in areas managed for woodland.
- Productivity is limited in areas of the Jeffrey soil because of the limited rooting depth.

Urban Development

Dwellings
Suitability: Poorly suited
Management concerns: Cheoah—slope, depth to bedrock, erodibility, and corrosivity; Jeffrey—slope, depth to bedrock, and erodibility
Management measures and considerations:
- Designing structures on the contour with the natural slope or building in less sloping areas helps to improve soil performance.
- Drilling and blasting of rock or special earth-moving equipment is needed to increase the depth of these soils.

- Vegetating cleared and graded areas as soon as possible or constructing silt fences helps to maintain soil stability and prevents sediments from leaving the site.
- Using corrosion-resistant materials helps to reduce the risk of damage to concrete.

Septic tank absorption fields
Suitability: Poorly suited
Management concerns: Slope and depth to bedrock
Management measures and considerations:
- Contact the local Health Department for guidance on sanitary facilities.
- Installing distribution lines on the contour helps to improve the performance of septic tank absorption fields.
- Locating and using areas of the deeper Cheoah soil may improve the performance of filter fields.

Local roads and streets
Suitability: Poorly suited
Management concerns: Slope, erodibility, depth to bedrock, and frost action
Management measures and considerations:
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Blasting, shaping, and grading are needed if roads are to be constructed on the contour.
- The permanent surfacing of roads or the use of suitable subgrade or base material allows the year-round use of roads and helps to reduce the damage from frost heaving.

Lawns and landscaping
Suitability: Poorly suited
Management concerns: Cheoah—slope, erodibility, pesticide retention, soil fertility, climate, and depth to bedrock; Jeffrey—slope, erodibility, pesticide retention, soil fertility, climate, depth to bedrock, and droughtiness
Management measures and considerations:
- Designing plantings on natural contours helps to increase water infiltration.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- These soils may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to landscape plants.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Using lime, fertilizer, mulch, and irrigation helps to establish lawns and landscape plants.
- Topsoil should be stockpiled from disturbed areas and replaced before landscaping.
- The use of native, winter-hardy landscape plants is recommended.
- Due to the cooler air temperatures associated with the north- to east-facing aspects of this map unit, late spring frost may damage new growth in some years.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of the moderately deep rooting depth, areas of the Jeffrey soil are difficult to manage for lawns and landscaping, especially if the soil has been disturbed.

Interpretive Groups

Land capability classification: Cheoah—4e; Jeffrey—6s

CrE—Cheoah-Jeffrey complex, 30 to 50 percent slopes, rocky

Setting

Landscape: Intermediate mountains in the western part of the county
Elevation range: 1,790 to 5,000 feet
Landform: North- to east-facing ridges and mountain slopes and those shaded by the higher mountains
Landform position: Summits and side slopes
Shape of areas: Long and narrow on summits and irregular on side slopes
Size of areas: Up to 266 acres

Map Unit Composition

Cheoah soil and similar inclusions: 50 percent
Jeffrey soil and similar inclusions: 40 percent
Rock outcrop: 2 percent
Dissimilar inclusions: 8 percent

Typical Profile

Cheoah

Surface layer:
0 to 2 inches—moderately decomposed plant material
2 to 8 inches—very dark grayish brown channery loam
8 to 14 inches—dark brown channery loam

Subsoil:
14 to 40 inches—yellowish brown loam

Underlying material:
40 to 55 inches—yellowish brown channery fine sandy loam saprolite

Bedrock:
55 to 80 inches—weathered, interbedded metasandstone and phyllite

Jeffrey

Surface layer:
0 to 3 inches—very dark grayish brown channery loam
3 to 8 inches—dark brown channery loam

Subsoil:
8 to 13 inches—brown channery loam
13 to 27 inches—dark yellowish brown channery loam

Underlying material:
27 to 34 inches—brown channery sandy loam

Bedrock:
34 to 80 inches—unweathered, hard, arkosic metasandstone

Soil Properties and Qualities

Depth class: Cheoah—deep; Jeffrey—moderately deep
Drainage class: Well drained
General texture class: Loamy
Permeability: Moderately rapid
Available water capacity: Cheoah—moderate; Jeffrey—low
Depth to seasonal high water table: More than 6.0 feet

Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Steep
Soil slippage potential: Low
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: Widely scattered flagstones and stones that average about 6 to 24 inches in length and are about 25 to 75 feet apart
Extent of Rock outcrop: About 2 percent of the soil surface
Organic matter content of surface layer: High or very high
Potential for frost action: Moderate
Special climatic conditions: Soils subject to cooler annual air temperatures, which allow late spring and early fall frosts, and higher soil moisture content due to north- to east-facing aspects or shading by the higher mountains
Soil reaction: Extremely acid to strongly acid throughout the profile
Parent material: Residuum affected by soil creep in the upper part, weathered from low-grade metasedimentary rock
Depth to bedrock: Cheoah—40 to 60 inches to soft bedrock; Jeffrey—20 to 40 inches to hard bedrock
Other distinctive properties: Soils subject to downslope movement when lateral support is removed and to differential settling when used as fill material; water movement along bedrock contacts in areas of the Jeffrey soil

Minor Components

Dissimilar inclusions:
- Spivey soils that have more rock fragments in the subsoil and have bedrock at a depth of more than 60 inches, in drainageways and below rock outcrops
- Santeetlah soils that have bedrock at a depth of more than 60 inches, in concave areas at the head of drains and on footslopes
- Ditney and Unicoi soils that have thinner surface layers with less organic matter and have hard bedrock at a depth of 7 to 40 inches, on south- to west-facing shoulder slopes and nose slopes
- Soco and Stecoah soils that have thinner surface layers with less organic matter and have soft bedrock at a depth of 20 to 60 inches, on south- to west-facing shoulder slopes and nose slopes
- Random areas of soils that have bedrock at a depth of more than 60 inches
- Random areas of soils on slopes of less than 30 percent or more than 50 percent
- Prominent ridges and upper side slopes that are subject to frequent rime ice in winter and high winds year-round

Similar inclusions:
- Cheoah and Jeffrey soils that have surface layers of sandy loam or fine sandy loam

Land Use

Dominant Uses: Woodland and wildlife habitat
Other Uses: Recreation, pasture, and building site development

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, depth to bedrock, and stony surface. A site should be selected on better suited soils.

Pasture and hayland

Suitability: Pasture—poorly suited; hayland—unsuited

Management concerns: Cheoah—equipment use, erodibility, pesticide retention, soil fertility, and rooting depth; Jeffrey—equipment use, erodibility, pesticide retention, soil fertility, rooting depth, and droughtiness

Management measures and considerations:

- Because of the slope, this map unit is difficult to manage for pasture or hayland.
- Growing adapted plants helps to ensure the production of high-quality forage and minimize soil erosion.
- These soils may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using rotational grazing and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.
- Because of the low available water capacity due to the moderately deep rooting depth, the Jeffrey soil is difficult to manage for the production of pasture and hay crops.

Orchard and ornamental crops

Suitability: Poorly suited

Management concerns: Cheoah—equipment use, erodibility, pesticide retention, ball and burlap harvesting, plant shape, climate, soil fertility, and rooting depth; Jeffrey—equipment use, erodibility, pesticide retention, ball and burlap harvesting, plant shape, climate, soil fertility, rooting depth, and droughtiness

Management measures and considerations:

- These soils may be difficult to manage for orchard or ornamental crops because the slope limits equipment use.
- These soils may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Avoiding ball and burlap harvesting during dry periods helps to prevent fracture of the ball and separation of the soil from the roots caused by a low moisture content and a minimal clay content.
- The slope affects the shape of ornamentals on the uphill side.
- Due to the cooler air temperatures associated with the north- to east-facing aspects of this map unit, late spring frost may damage new growth in some years.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximize productivity.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of the low available water capacity and windthrow hazard due to the moderately deep rooting depth, the Jeffrey soil is difficult to manage for orchard and ornamental crops.

Woodland Management and Productivity

Potential for commercial species: Moderately high for cove hardwoods and northern hardwoods

Suitability: Poorly suited

Management concerns: Cheoah—equipment use, erodibility, and pesticide retention; Jeffrey—equipment use, erodibility, pesticide retention, and windthrow hazard
Management measures and considerations:
- The underlying bedrock may be susceptible to mass movement. An onsite investigation is needed to determine the suitability and limitations of any area within this map unit.
- Using cable logging methods helps to minimize road and trail construction, especially in areas where slope exceeds 40 percent.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.
- When the soil is wet, skid trails and unsurfaced roads are highly erodible and very slick due to the slope and the high content of organic matter in the surface layer.
- Avoiding logging operations during periods when the soil is saturated helps to prevent rutting of the soil surface and damage to tree roots due to soil compaction.
- Blasting, shaping, and grading are needed if roads are to be constructed on the contour.
- Leaving a buffer zone of trees and shrubs adjacent to streams helps to minimize siltation and provides shade for the aquatic habitat.
- Livestock should not be allowed to graze in areas managed for woodland.
- Productivity is limited in areas of the Jeffrey soil because of the limited rooting depth.

Urban Development

Dwellings

Suitability: Poorly suited
Management concerns: Cheoah—slope, depth to bedrock, erodibility, and corrosivity; Jeffrey—slope, depth to bedrock, and erodibility
Management measures and considerations:
- Designing structures on the contour with the natural slope or building in less sloping areas helps to improve soil performance.
- Drilling and blasting of rock or special earth-moving equipment is needed to increase the depth of these soils.
- Vegetating cleared and graded areas as soon as possible or constructing silt fences helps to maintain soil stability and prevents sediments from leaving the site.
- Using corrosion-resistant materials helps to reduce the risk of damage to concrete.

Septic tank absorption fields

Suitability: Poorly suited
Management concerns: Depth to bedrock and slope
Management measures and considerations:
- Contact the local Health Department for guidance on sanitary facilities.
- Locating and using areas of the deeper Cheoah soil may improve the performance of filter fields.
- Installing distribution lines on the contour helps to improve the performance of septic tank absorption fields.

Local roads and streets

Suitability: Poorly suited
Management concerns: Slope, erodibility, depth to bedrock, frost action, and seeps and springs

Management measures and considerations:
- The underlying bedrock may be susceptible to mass movement. An onsite investigation is needed to determine the suitability and limitations of any area within this map unit.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Blasting, shaping, and grading are needed if roads are to be constructed on the contour.
- The permanent surfacing of roads or the use of suitable subgrade or base material allows the year-round use of roads and helps to reduce the damage from frost heaving.
- Intercepting and diverting underground water from seeps and springs helps to stabilize cut and fill slopes.

Lawns and landscaping
Suitability: Poorly suited
Management concerns: Cheoah—slope, erodibility, pesticide retention, soil fertility, climate, and depth to bedrock; Jeffrey—slope, erodibility, pesticide retention, soil fertility, climate, depth to bedrock, and droughtiness
Management measures and considerations:
- Designing plantings on natural contours helps to increase water infiltration.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- These soils may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to landscape plants.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Using lime, fertilizer, mulch, and irrigation helps to establish lawns and landscape plants.
- Topsoil should be stockpiled from disturbed areas and replaced before landscaping.
- The use of native, winter-hardy landscape plants is recommended.
- Due to the cooler air temperatures associated with the north- to east-facing aspects of this map unit, late spring frost may damage new growth in some years.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of the moderately deep rooting depth, areas of the Jeffrey soil are difficult to manage for lawns and landscaping, especially if the soil has been disturbed.

Interpretive Groups

Land capability classification: Cheoah—6e; Jeffrey—7s

CsF—Cheoah-Jeffrey complex, 50 to 95 percent slopes, very rocky

Setting

Landscape: Intermediate mountains in the western part of the county
Elevation range: 1,130 to 5,000 feet
Landform: North- to east-facing mountain slopes and those slopes shaded by the higher mountains

Landform position: Side slopes
Shape of areas: Irregular
Size of areas: Up to 414 acres

Map Unit Composition

Cheoah soil and similar inclusions: 50 percent
Jeffrey soil and similar inclusions: 40 percent
Rock outcrop: 7 percent
Dissimilar inclusions: 3 percent

Typical Profile

Cheoah

Surface layer:
0 to 2 inches—moderately decomposed plant material
2 to 8 inches—very dark grayish brown channery loam
8 to 14 inches—dark brown channery loam

Subsoil:
14 to 40 inches—yellowish brown loam

Underlying material:
40 to 55 inches—yellowish brown channery fine sandy loam saprolite

Bedrock:
55 to 80 inches—weathered, interbedded metasandstone and phyllite

Jeffrey

Surface layer:
0 to 3 inches—very dark grayish brown channery loam
3 to 8 inches—dark brown channery loam

Subsoil:
8 to 13 inches—brown channery loam
13 to 27 inches—dark yellowish brown channery loam

Underlying material:
27 to 34 inches—brown channery sandy loam

Bedrock:
34 to 80 inches—unweathered, hard, arkosic metasandstone

Soil Properties and Qualities

Depth class: Cheoah—deep; Jeffrey—moderately deep
Drainage class: Well drained
General texture class: Loamy
Permeability: Moderately rapid
Available water capacity: Cheoah—moderate; Jeffrey—low
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Very steep
Soil slippage potential: Medium
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe

Rock fragments on the surface: About 3 percent flagstones and stones that average about 6 to 24 inches in length and are about 3 to 25 feet apart
Extent of Rock outcrop: About 7 percent of the soil surface
Organic matter content of surface layer: High or very high
Potential for frost action: Moderate
Special climatic conditions: Soils subject to cooler annual air temperatures, which allow late spring and early fall frosts, and a higher soil moisture content due to north- to east-facing aspects or shading by the higher mountains
Soil reaction: Extremely acid to strongly acid throughout the profile
Parent material: Residuum affected by soil creep in the upper part, weathered from low-grade metasedimentary rock
Depth to bedrock: Cheoah—40 to 60 inches to soft bedrock; Jeffrey—20 to 40 inches to hard bedrock
Other distinctive properties: Soils subject to downslope movement when lateral support is removed and to differential settling when used as fill material; water movement along bedrock contacts in areas of the Jeffrey soil

Minor Components

Dissimilar inclusions:
- Spivey soils that have more rock fragments in the subsoil and have bedrock at a depth of more than 60 inches, in drainageways and below rock outcrops
- Santeetlah soils that have bedrock at a depth of more than 60 inches, in concave areas at the head of drains and on footslopes
- Random areas of soils that have bedrock at a depth of more than 60 inches
- Ditney and Unicoi soils that have thinner surface layers with less organic matter and have hard bedrock at a depth of 7 to 40 inches, on south- to west-facing shoulder slopes and nose slopes
- Soco and Stecoah soils that have thinner surface layers with less organic matter and have soft bedrock at a depth of 20 to 60 inches, on south- to west-facing shoulder slopes and nose slopes
- Random areas of soils on slopes of less than 50 percent or more than 95 percent
- Prominent ridges and upper side slopes that are subject to frequent rime ice in winter and high winds year-round

Similar inclusions:
- Cheoah and Jeffrey soils that have surface layers of sandy loam or fine sandy loam

Land Use

Dominant Uses: Woodland and wildlife habitat

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, depth to bedrock, and very stony surface. A site should be selected on better suited soils.

Pasture and hayland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for the production of pasture and hay crops because of the slope, depth to bedrock, and very stony surface. A site should be selected on better suited soils.

Orchard and ornamental crops
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for orchard and ornamental crops because of the slope, erodibility, depth to bedrock, and very stony surface. A site should be selected on better suited soils.

Woodland Management and Productivity

Potential for commercial species: Moderately high for cove hardwoods and northern hardwoods
Suitability: Poorly suited
Management concerns: Cheoah—equipment use, erodibility, and pesticide retention; Jeffrey—equipment use, erodibility, pesticide retention, and windthrow hazard
Management measures and considerations:
- Using cable logging methods helps to overcome the equipment limitation and prevents the acceleration of erosion caused by road construction, skid trails, and disturbance of the forest floor by heavy machinery.
- Leaving a buffer zone of trees and shrubs adjacent to streams helps to minimize siltation and provides shade for the aquatic habitat.
- Livestock should not be allowed to graze in areas managed for woodland.
- Productivity is limited in areas of the Jeffrey soil because of the limited rooting depth.

Urban Development

Dwellings
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for dwellings because of the slope, erodibility, depth to bedrock, and very stony surface. A site should be selected on better suited soils.

Septic tank absorption fields
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for septic tank absorption fields because of the slope, depth to bedrock, and very stony surface. Contact the local Health Department for additional guidance.

Local roads and streets
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for roads and streets because of the slope, erodibility, depth to bedrock, and very stony surface. A site should be selected on better suited soils.

Lawns and landscaping
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for lawns and landscaping because of the slope, erodibility, depth to bedrock, and very stony surface. A site should be selected on better suited soils.

Interpretive Groups

Land capability classification: 7s

CwA—Cullowhee-Ela complex, 0 to 3 percent slopes, occasionally flooded

Setting

Landscape: Mountain valleys of low and intermediate mountains throughout the county
Elevation range: 1,270 to 3,250 feet
Landform: Flood plains
Landform position: Planar to slightly concave bottomland slopes
Shape of areas: Irregular
Size of areas: Up to 109 acres

Map Unit Composition

Cullowhee soil and similar inclusions: 50 percent
Ela soil and similar inclusions: 40 percent
Dissimilar inclusions: 10 percent

Typical Profile

Cullowhee

Surface layer:
0 to 12 inches—dark brown fine sandy loam

Subsoil:
12 to 18 inches—yellowish brown fine sandy loam

Underlying material:
18 to 33 inches—dark grayish brown and yellowish brown loamy fine sand
33 to 80 inches—dark grayish brown very cobbly fine sand

Ela

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 16 inches—black silt loam

Underlying material:
16 to 32 inches—dark grayish brown fine sandy loamy with mottles in shades of red and gray
32 to 80 inches—dark grayish brown extremely cobbly sandy loam

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Cullowhee—somewhat poorly drained; Ela—poorly drained or very poorly drained
General texture class: Loamy in the upper part and sandy or sandy-skeletal in the lower part
Permeability: Moderately rapid in the surface horizon and upper portion of the subsoil and rapid in the underlying material
Available water capacity: Low
Depth to seasonal high water table: Cullowhee—1.0 to 2.0 feet from December through May and 2.0 to 3.5 feet from June through November; Ela—1.0 foot or less from December through May and 0.5 foot to 1.5 feet from June through November
Hazard of flooding: Occasional, throughout the year with standing water for less than 2 days
Shrink-swell potential: Low

Slope class: Nearly level
Soil slippage potential: None
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: None or slight
Organic matter content of surface layer: High or very high
Potential for frost action: Moderate
Special climatic conditions: Soils subject to slow air drainage, which allows late spring and early fall frosts
Soil reaction: Very strongly acid to slightly acid throughout the profile
Parent material: Alluvium derived from low-grade metasedimentary rock
Depth to bedrock: More than 60 inches
Depth to contrasting material: 20 to 40 inches to deposits of gravel and cobbles that are stratified with sandy or loamy material
Other distinctive properties: Soils subject to scouring and deposition during flooding; soils subject to ponding for brief periods throughout the year; soils subject to overland flow of storm water from adjacent uplands

Minor Components

Dissimilar inclusions:
- Moderately well drained Dellwood and Reddies soils in the slightly higher-lying positions and adjacent stream channels
- Moderately well drained Dillard soils that are rarely flooded, on adjacent toeslopes
- Well drained Thurmont soils on adjacent toeslopes
- Random areas of soils on slopes of more than 3 percent
- Poorly drained soils that have clayey subsoils, in low-lying depressions in backwater areas

Similar inclusions:
- Cullowhee soils that have surface layers of sandy loam or loam
- Ela soils that have surface layers of sandy loam, fine sandy loam, or loam

Land Use

Dominant Uses: Pasture and hayland
Other Uses: Cropland and wildlife habitat

Agricultural Development

Cropland

Suitability: Cullowhee—poorly suited; Ela—unsuited
Management concerns: Flooding, wetness, soil fertility, nutrient leaching, pesticide retention, and climate
Management measures and considerations:
- While most flooding occurs during the winter months, there is a risk of crop loss during the growing season.
- Maintaining existing artificial drainage systems helps to reduce the wetness limitation caused by the seasonal high water table and improves soil productivity.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes crop productivity.
- Using split applications helps to increase the effectiveness of lime and fertilizer and helps to avoid the leaching of plant nutrients below the rooting zone and into the water table.
- These soils may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides.

• Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.

Pasture and hayland

Suitability: Cullowhee—well suited; Ela—poorly suited

Management concerns: Flooding, wetness, pesticide retention, soil fertility, nutrient leaching, and erodibility

Management measures and considerations:

• While most flooding occurs during the winter months, there is a risk of crop loss during the growing season.
• Maintaining existing drainageways and ditches helps to remove excess water.
• These soils may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to future crops.
• Plant-applied pesticides may be more effective than soil-applied pesticides.
• Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
• Using split applications helps to increase the effectiveness of lime and fertilizer and helps to avoid the leaching of plant nutrients below the rooting zone and into the water table.
• Using rotational grazing, implementing a well planned harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.
• Fencing livestock away from creeks and streams helps to prevent streambank erosion and sedimentation.

Orchard and ornamental crops

Suitability for orchards: Unsuited

Suitability for ornamental crops: Cullowhee—poorly suited; Ela—unsuited

Management concerns:

• This map unit is severely limited for orchards because of the wetness and flooding. A site should be selected on better suited soils.

Woodland Management and Productivity

Potential for commercial species: Cullowhee—moderately high for cove hardwoods; Ela—very low woodland productivity

Suitability: Cullowhee—suited; Ela—unsuited

Management concerns:

• The wetness and flooding are severe limitations affecting timber production. A site should be selected on better suited soils.

Urban Development

Dwellings

Suitability: Unsuited

Management concerns:

• This map unit is severely limited for dwellings because of the wetness and flooding. A site should be selected on better suited soils.

Septic tank absorption fields

Suitability: Unsuited

Management concerns:

• This map unit is severely limited for septic tank absorption fields because of the flooding, wetness, and poor filtering capacity. A site should be selected on better suited soils. Contact the local Health Department for additional guidance.

Local roads and streets
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for roads and streets because of the wetness and flooding. A site should be selected on better suited soils.

Lawns and landscaping
Suitability: Cullowhee—suited; Ela—unsuited
Management concerns: Cullowhee—flooding, wetness, root disease, pesticide retention, soil fertility, nutrient leaching, and climate; Ela—wetness and flooding
Management measures and considerations:
- An onsite investigation is needed to determine the suitability and limitations of any area within this map unit.
- Because of the flooding, these soils are difficult to manage for lawns and landscaping.
- Maintaining existing artificial drainage systems helps to reduce the wetness limitation caused by the seasonal high water table and improves soil productivity.
- Because of the seasonal high water table, soil wetness, and flooding, phytophthora root disease is a severe limitation for Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- These soils may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to landscape plants.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Using lime, fertilizer, mulch, and irrigation helps to establish lawns and landscape plants.
- Using split applications helps to increase the effectiveness of lime and fertilizer and helps to avoid the leaching of plant nutrients below the rooting zone and into the water table.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.

Interpretive Groups

Land capability classification: Cullowhee—3w; Ela—6w

DAM—Dam

This map unit consists of structures built to impound bodies of water. Earthen materials used for dam core and fill slopes are usually from adjacent areas. No interpretations are given for this map unit.

DeB—Dellwood-Reddies complex, 0 to 5 percent slopes, occasionally flooded

Setting

Landscape: Mountain valleys of low and intermediate mountains throughout the county
Elevation range: 1,080 to 4,000 feet
Landform: Flood plains dominantly at the upper end of mountain valleys
Landform position: Planar to slightly convex bottomland slopes
Shape of areas: Long and narrow
Size of areas: Up to 196 acres

Map Unit Composition

Dellwood soil and similar inclusions: 60 percent
Reddies soil and similar inclusions: 20 percent
Dissimilar inclusions: 20 percent

Typical Profile

Dellwood

Surface layer:
0 to 8 inches—very dark grayish brown gravelly fine sandy loam
8 to 16 inches—dark brown extremely gravelly sand

Underlying material:
16 to 80 inches—extremely gravelly coarse sand multicolored in shades of brown and yellow

Reddies

Surface layer:
0 to 12 inches—dark brown fine sandy loam

Subsoil:
12 to 22 inches—yellowish brown loam
22 to 27 inches—yellowish brown fine sandy loam

Underlying material:
27 to 31 inches—yellowish brown loamy sandy
31 to 80 inches—multicolored very cobbly loamy sand

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Moderately well drained
General texture class: Dellwood—sandy in the upper part and sandy-skeletal in the lower part; Reddies—loamy in the upper part and sandy or sandy-skeletal in the lower part
Permeability: Dellwood—moderately rapid in the surface horizon and rapid or very rapid in the underlying material; Reddies—moderately rapid in the surface horizon and subsoil and rapid or very rapid in the underlying material
Available water capacity: Very low
Depth to seasonal high water table: Dellwood—2.0 to 4.0 feet from December through May and 2.5 to 4.5 feet from June through November; Reddies—2.0 to 3.5 feet from December through May and 2.5 to 4.5 feet from June through November
Hazard of flooding: Occasional, throughout the year with standing water for less than 2 days
Shrink-swell potential: Low
Slope class: Nearly level or gently sloping
Soil slippage potential: None
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Slight or moderate
Organic matter content of surface layer: High
Potential for frost action: Dellwood—low; Reddies—moderate
Special climatic conditions: Soils subject to slow air drainage, which allows late spring and early fall frosts
Soil reaction: Very strongly acid to neutral throughout the profile
Parent material: Alluvium derived from low-grade metasedimentary rock
Depth to bedrock: More than 60 inches

Depth to contrasting material: Dellwood—8 to 20 inches to deposits of gravel and cobbles that are stratified with sandy or loamy material; Reddies—20 to 40 inches to deposits of gravel and cobbles that are stratified with sandy or loamy material
Other distinctive properties: Soils subject to scouring and deposition during flooding

Minor Components

Dissimilar inclusions:
- Soils that are well drained to excessively well drained, in the wider units and in those adjacent to deep stream channels
- Soils that are rarely flooded, on the wider flood plains
- Somewhat poorly drained Cullowhee and poorly drained Ela soils that have subsoils that are loamy in the upper part and that have strata with a high content of rock fragments at a depth of 20 to 40 inches, in depressions, old stream channels, and backwater areas
- Well drained soils that have strata with a high content of rock fragments at a depth of more than 40 inches, in the slightly higher-lying positions
- Moderately well drained Dillard soils that have more clay and fewer rock fragments in the subsoil, on low stream terraces and toeslopes
- Soils that have bedrock at a depth of less than 6.0 feet, in drainageways
- Random areas of soils with slopes of more than 5 percent

Similar inclusions:
- Dellwood and Reddies soils that have surface layers of sandy loam and loam

Land Use

Dominant Uses: Pasture and hayland
Other Uses: Cropland and ornamental crops

Agricultural Development

Cropland
Suitability: Suited
Management concerns: Flooding, droughtiness, pesticide retention, soil fertility, nutrient leaching, and climate
Management measures and considerations:
- The Dellwood soil is limited for crop production because of the high content of rock fragments.
- While most flooding occurs during the winter months, there is a risk of crop loss during the growing season.
- The Dellwood and Reddies soils have a low available water capacity and become droughty during periods of low rainfall.
- Using conservation tillage, winter cover crops, crop residue management, and crop rotations which include grasses and legumes helps to increase the available water capacity and improve soil fertility.
- These soils may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes crop productivity.
- Using split applications helps to increase the effectiveness of lime and fertilizer and helps to avoid the leaching of plant nutrients below the rooting zone and into the water table.
- Using frequent and light applications of irrigation water helps to avoid the leaching of plant nutrients below the rooting zone.

- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.

Pasture and hayland

Suitability: Suited

Management concerns: Flooding, droughtiness, pesticide retention, soil fertility, nutrient leaching, and erodibility

Management measures and considerations:

- While most flooding occurs during the winter months, there is a risk of crop loss during the growing season.
- These soils have a low available water capacity and become droughty during periods of low rainfall.
- Using supplemental irrigation and crop varieties adapted to droughty conditions helps to increase crop production.
- These soils may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using split applications helps to increase the effectiveness of lime and fertilizer and helps to avoid the leaching of plant nutrients below the rooting zone and into the water table.
- Using rotational grazing, implementing a well planned harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.
- Fencing livestock away from creeks and streams helps to prevent streambank erosion and sedimentation.

Orchard and ornamental crops

Suitability for orchards: Unsuited

Suitability for ornamental crops: Dellwood—poorly suited; Reddies—suited

Management concerns: Dellwood—flooding, droughtiness, root disease, climate, soil fertility, nutrient leaching, pesticide retention, and ball and burlap harvesting; Reddies—flooding, droughtiness, root disease, climate, soil fertility, nutrient leaching, and pesticide retention

Management measures and considerations:

- Because of the potential for flooding, these soils can be difficult to manage for orchard or ornamental crops.
- These soils have a low available water capacity and become droughty during periods of low rainfall.
- Because of the seasonal high water table and flooding, phytophthora root disease is a potential limitation for Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as toeslopes and drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximize productivity.
- Using split applications helps to increase the effectiveness of lime and fertilizer and helps to avoid the leaching of plant nutrients below the rooting zone and into the water table.

- Using frequent and light applications of irrigation water helps to avoid the leaching of plant nutrients below the rooting zone.
- These soils may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Avoiding ball and burlap harvesting during dry periods helps to prevent fracture of the ball and separation of the soil from the roots caused by the moisture content and minimal clay content of the Reddies soil.
- Ball and burlap harvesting is severely limited in areas of the Dellwood soil due to the high content of rock fragments in the soil.

Woodland Management and Productivity

Potential for commercial species: Moderately high for cove hardwoods
Suitability: Well suited
Management concerns: Flooding and pesticide retention
Management measures and considerations:

- The potential for flooding needs to be considered in the placement of haul roads and log landings.
- Soil-applied herbicides are retained due to herbicide-organic matter bonding and may damage tree seedlings when cropland is converted to woodland.

Urban Development

Dwellings

Suitability: Unsuited
Management concerns:

- This map unit is severely limited for dwellings because of the flooding and wetness. A site should be selected on better suited soils.

Septic tank absorption fields

Suitability: Unsuited
Management concerns:

- This map unit is severely limited for septic tank absorption fields because of the wetness and poor filtering capacity. Contact the local Health Department for additional guidance.

Local roads and streets

Suitability: Unsuited
Management concerns:

- This map unit is severely limited for roads and streets because of the flooding. A site should be selected on better suited soils.

Lawns and landscaping

Suitability: Suited
Management concerns: Dellwood—flooding, droughtiness, pesticide retention, soil fertility, nutrient leaching, root disease, climate, and high content of rock fragments; Reddies—flooding, droughtiness, pesticide retention, soil fertility, nutrient leaching, root disease, and climate
Management measures and considerations:

- Because of the flooding, these soils are difficult to manage and use is severely limited during periods of inundation.
- Using lime, fertilizer, mulch, irrigation, and varieties adapted to droughty conditions helps to establish lawns and landscape plants. Split applications help to increase the effectiveness of lime and fertilizer.
- Using frequent and light applications of irrigation water helps to avoid the leaching of plant nutrients below the rooting zone.

- These soils may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to landscape plants.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Because of the seasonal high water table and flooding, phytophthora root disease is a potential limitation for Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as toeslopes and drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.
- The Dellwood soil is severely limited for lawns and landscaping because of the high content of rock fragments.

Interpretive Groups

Land capability classification: Dellwood—3s; Reddies—2w

DrB—Dillard loam, 1 to 5 percent slopes, rarely flooded

Setting

Landscape: Mountain valleys of low and intermediate mountains and intermountain hills throughout the county
Elevation range: 1,760 to 2,650 feet
Landform: Low stream terraces
Landform position: Concave to planar toeslopes
Shape of areas: Long and narrow
Size of areas: Up to 21 acres

Map Unit Composition

Dillard soil and similar inclusions: 80 percent
Dissimilar inclusions: 20 percent

Typical Profile

Surface layer:
0 to 9 inches—dark brown loam

Subsoil:
9 to 32 inches—yellowish brown clay loam with mottles in shades of red and brown
32 to 49 inches—yellowish brown clay loam with mottles in shades of red, brown, and gray
49 to 53 inches—light brownish gray loam with mottles in shades of brown and yellow

Underlying material:
53 to 80 inches—light brownish gray loam with mottles in shades of brown and yellow

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Moderately well drained
General texture class: Loamy
Permeability: Moderately slow
Available water capacity: Moderate or high
Depth to seasonal high water table: 2.0 to 3.0 feet from December through May and 2.0 to 3.5 feet from June through November
Hazard of flooding: Rare, throughout the year with standing water for less than 2 days

Shrink-swell potential: Low
Slope class: Gently sloping
Soil slippage potential: None
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Moderate
Organic matter content of surface layer: Moderate or high
Potential for frost action: Moderate
Soil reaction: Strongly acid or moderately acid in the A horizon, except in limed areas, and very strongly acid to moderately acid in the B and C horizons
Parent material: Old alluvium derived from low-grade metasedimentary rock
Depth to bedrock: More than 60 inches
Other distinctive properties: Random areas of seeps and springs; soil subject to overland flow of storm water from adjacent uplands

Minor Components

Dissimilar inclusions:
- Well drained Thurmont soils that have a water table at a depth of 40 to 60 inches, on toeslopes and footslopes
- Well drained Statler soils on low terraces
- Areas of moderately eroded soils and soils that have surface layers with less organic matter, in cropped fields
- Random areas of moderately eroded soils
- Well drained Braddock and Unison soils that have clayey subsoils, on high terraces
- Somewhat poorly drained Cullowhee soils that have subsoils that are coarse-loamy in the upper part and that have strata with a high content of rock fragments at a depth of 20 to 40 inches, along stream channels
- Very poorly drained Hemphill soils that have clayey subsoils, in depressions and backwater areas
- Well drained soils that have loamy subsoils, along stream channels
- Moderately well drained Dellwood and Reddies soils that are loamy in the upper part and have strata with a high content of rock fragments at a depth of 8 to 40 inches, along stream channels
- Random areas with slopes of more than 5 percent

Similar inclusions:
- Dillard soils that have surface layers of sandy loam, fine sandy loam, or sandy clay loam

Land Use

Dominant Uses: Cropland
Other Uses: Pasture and hayland

Agricultural Development

Cropland
Suitability: Well suited
Management concerns: Erodibility, climate, tilth, and soil fertility
Management measures and considerations:
- Using conservation practices, such as contour farming, winter cover crops, and crop rotations which include grasses and legumes, helps to minimize soil erosion, maximize the infiltration of rainfall, increase the available water capacity, and improve soil fertility.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.

Figure 12.—Hayland on low stream terraces in an area of Dillard loam, 1 to 5 percent slopes, rarely flooded.

- Avoiding tillage during wet periods, incorporating crop residue into the soil, or leaving residue on the soil surface helps to minimize clodding and crusting and increases the infiltration of rainfall.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes crop productivity.

Pasture and hayland
Suitability: Well suited (fig. 12)
Management concerns: Erodibility and soil fertility
Management measures and considerations:
- Preparing seedbeds on the contour or across the slope helps to minimize soil erosion and increases germination.
- Growing adapted plants helps to ensure the production of high-quality forage and minimize soil erosion.
- Fencing livestock away from creeks and streams helps to prevent streambank erosion and sedimentation.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using rotational grazing, implementing a well planned harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.

Orchard and ornamental crops
Suitability: Poorly suited
Management concerns: Erodibility, wetness, climate, root disease, and soil fertility
Management measures and considerations:
- Establishing and maintaining sod between rows and on access roads helps to reduce the hazard of erosion.

- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.
- Because of the seasonal high water table and wetness and the restricted movement of air and water due to the clay content of the subsoil, phytophthora root disease is a potential limitation for Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximize productivity.

Woodland Management and Productivity

Potential for commercial species: Moderately high for cove hardwoods and very high for eastern white pine
Suitability: Well suited
Management concerns: Erodibility and equipment use
Management measures and considerations:
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.
- When the soil is wet, skid trails and unsurfaced roads are highly erodible and very slick due to the slope, the high content of organic matter in the surface layer, and the clay content of the subsoil.
- Avoiding logging operations during periods when the soil is saturated helps to prevent rutting of the soil surface and damage to tree roots due to soil compaction.
- Leaving a buffer zone of trees and shrubs adjacent to streams helps to minimize siltation and provides shade for the aquatic habitat.
- Livestock should not be allowed to graze in areas managed for woodland.

Urban Development

Dwellings

Suitability: Poorly suited
Management concerns: Flooding, wetness, erodibility, and corrosivity
Management measures and considerations:
- An onsite investigation is needed to determine the suitability and limitations of any area within this map unit for dwellings.
- This map unit is difficult to manage for dwellings because of the seasonal high water table.
- There is a moderate or high risk of corrosion for uncoated steel and concrete.

Septic tank absorption fields

Suitability: Poorly suited
Management concerns: Wetness, seeps and springs, and restricted permeability
Management measures and considerations:
- Contact the local Health Department for guidance on sanitary facilities.
- An onsite investigation is needed to determine the suitability and limitations of any area within this map unit for septic tank absorption fields.
- This map unit is difficult to manage for septic tank absorption fields because of the seasonal high water table.
- Excavations may cut into seeps and springs. These areas should be avoided.

Local roads and streets
Suitability: Poorly suited
Management concerns: Low strength, seeps and springs, erodibility, and flooding
Management measures and considerations:
- When the soil is wet, unsurfaced roads are highly erodible and very slick due the content of silt and clay in the subsoil.
- Incorporating sand and gravel into the soil, compacting roadbeds, and designing roads that conform to natural slopes help to improve soil strength.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.

Lawns and landscaping
Suitability: Suited
Management concerns: Erodibility, wetness, flooding, root disease, soil fertility, soil compaction, and climate
Management measures and considerations:
- Designing plantings on natural contours helps to increase water infiltration
- Vegetating disturbed areas and using erosion-control structures, such as sediment fences helps to keep eroding soil on site.
- Because of the seasonal high water table and wetness and the restricted movement of air and water due to the clay content of the subsoil, phytophthora root disease is a potential limitation for Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Using lime, fertilizer, mulch, and irrigation helps to establish lawns and landscape plants.
- Topsoil should be stockpiled from disturbed areas and replaced before landscaping.
- Avoiding the use of heavy equipment in areas to be landscaped helps to prevent soil compaction.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.

Interpretive Groups

Land capability classification: 2w

DtD—Ditney-Unicoi-Rock outcrop complex, 15 to 30 percent slopes, very stony

Setting

Landscape: Low and intermediate mountains, dominantly in the northwestern, north-central, and southeastern parts of the county
Elevation range: 1,300 to 4,700 feet
Landform: Ridges
Landform position: Summits and upper side slopes
Shape of areas: Long and narrow
Size of areas: Up to 110 acres

Map Unit Composition

Ditney soil and similar inclusions: 40 percent
Unicoi soil and similar inclusions: 35 percent

Rock outcrop: 20 percent
Dissimilar inclusions: 5 percent

Typical Profile

Ditney

Surface layer:
0 to 3 inches—brown channery sandy loam

Subsoil:
3 to 26 inches—dark yellowish brown channery fine sandy loam

Bedrock:
26 to 80 inches—unweathered, hard metagraywacke

Unicoi

Surface layer:
0 to 1 inch—dark brown channery loam
1 to 4 inches—dark yellowish brown channery fine sandy loam

Subsoil:
4 to 15 inches—dark yellowish brown very flaggy fine sandy loam

Bedrock:
15 to 80 inches—unweathered, hard metagraywacke

Rock outcrop

This part of the map unit predominantly consists of metagraywacke and quartzite bedrock exposed at the surface.

Properties and Qualities of the Ditney and Unicoi Soils

Depth class: Ditney—moderately deep; Unicoi—shallow
Drainage class: Ditney—well drained; Unicoi—somewhat excessively drained
General texture class: Ditney—loamy; Unicoi—loamy with many rock fragments
Permeability: Moderately rapid
Available water capacity: Very low
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Moderately steep
Soil slippage potential: None
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: About 3 percent flagstones and stones that average about 6 to 24 inches in length and are about 3 to 25 feet apart
Organic matter content of surface layer: Low to high
Potential for frost action: Moderate
Soil reaction: Extremely acid to strongly acid throughout the profile
Parent material: Residuum weathered from low-grade metasedimentary rock
Depth to bedrock: Ditney—20 to 40 inches to hard bedrock; Unicoi—7 to 20 inches to hard bedrock
Other distinctive properties: Water movement along bedrock contacts; low natural fertility

Minor Components

Dissimilar inclusions:
- Random areas of Soco and Stecoah soils that have soft bedrock at a depth of 20 to 60 inches
- Soils that have hard bedrock at a depth of 1 to 7 inches, adjacent to rock outcrops
- Random areas of Junaluska and Brasstown soils that have more clay in the subsoil and have soft bedrock at a depth of 20 to 60 inches
- Random areas of soils on slopes of less than 15 percent or more than 30 percent
- Prominent ridges and upper side slopes that are subject to frequent rime ice in winter and high winds year-round

Similar inclusions:
- Ditney soils that have surface layers of fine sandy loam or loam
- Unicoi soils that have surface layers of sandy loam or fine sandy loam

Land Use

Dominant Uses: Woodland and wildlife habitat
Other Uses: Recreation and pasture

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, depth to bedrock, and very stony surface. A site should be selected on better suited soils.

Pasture and hayland
Suitability: Pasture—poorly suited; hayland—unsuited
Management concerns: Equipment use, rooting depth, droughtiness, erodibility, and soil fertility
Management measures and considerations:
- The moderately deep and shallow rooting depths, very stony surface, and slope are limitations affecting pasture and hayland.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using rotational grazing, implementing a well planned harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.

Orchard and ornamental crops
Suitability: Ditney—poorly suited; Unicoi—unsuited
Management concerns:
- This map unit is severely limited for orchard and ornamental crops because of the slope, erodibility, depth to bedrock, and very stony surface. A site should be selected on better suited soils.

Woodland Management and Productivity

Potential for commercial species: Low for upland hardwoods and moderate for eastern white pine
Suitability: Poorly suited
Management concerns: Equipment use, erodibility, windthrow hazard, and seedling survival

Management measures and considerations:
- The underlying bedrock may be susceptible to mass movement. An onsite investigation is needed to determine the suitability and limitations of any area within this map unit.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.
- Because of the low natural fertility and the droughty nature of the Ditney and Unicoi soils, revegetating cut and fill slopes can be difficult.
- Extensive blasting, shaping, and grading are needed if roads are to be constructed on the contour.
- Livestock should not be allowed to graze in areas managed for woodland.
- Productivity is limited due to the limited rooting depth.

Urban Development

Dwellings
Suitability: Ditney—poorly suited; Unicoi—unsuited
Management concerns:
- This map unit is severely limited for dwellings because of the slope, erodibility, and depth to bedrock. A site should be selected on better suited soils.

Septic tank absorption fields
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for septic tank absorption fields because of the depth to bedrock. Contact the local Health Department for additional guidance.

Local roads and streets
Suitability: Poorly suited
Management concerns: Depth to bedrock, slope, erodibility, slippage, and frost action
Management measures and considerations:
- The underlying bedrock may be susceptible to mass movement. An onsite investigation is needed to determine the suitability and limitations of any area within this map unit.
- Extensive blasting, shaping, and grading are needed if roads are to be constructed on the contour.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Because of the low natural fertility and the droughty nature of the Ditney and Unicoi soils, revegetating cut and fill slopes can be difficult.
- The permanent surfacing of roads or the use of suitable subgrade or base material allows the year-round use of roads and helps to reduce the damage from frost heaving.

Lawns and landscaping
Suitability: Ditney—poorly suited; Unicoi—unsuited
Management concerns:
- This map unit is severely limited for lawns and landscaping because of the slope, erodibility, depth to bedrock, and very stony surface. A site should be selected on better suited soils.

Interpretive Groups

Land capability classification: Ditney—6s; Unicoi—7s; Rock outcrop—8s

DtE—Ditney-Unicoi-Rock outcrop complex, 30 to 50 percent slopes, very stony

Setting

Landscape: Low and intermediate mountains, dominantly in the northwestern, north-central, and southeastern parts of the county
Elevation range: 1,250 to 4,860 feet
Landform: Ridges and south- to west-facing mountain slopes
Landform position: Summits and side slopes
Shape of areas: Long and narrow on summits and irregular on side slopes
Size of areas: Up to 44 acres

Map Unit Composition

Ditney soil and similar inclusions: 40 percent
Unicoi soil and similar inclusions: 35 percent
Rock outcrop: 20 percent
Dissimilar inclusions: 5 percent

Typical Profile

Ditney

Surface layer:
0 to 3 inches—brown channery sandy loam

Subsoil:
3 to 26 inches—dark yellowish brown channery fine sandy loam

Bedrock:
26 to 80 inches—unweathered, hard metagraywacke

Unicoi

Surface layer:
0 to 1 inch—dark brown channery loam
1 to 4 inches—dark yellowish brown channery fine sandy loam

Subsoil:
4 to 15 inches—dark yellowish brown very flaggy fine sandy loam

Bedrock:
15 to 80 inches—unweathered, hard metagraywacke

Rock outcrop

This part of the map unit predominantly consists of metagraywacke and quartzite bedrock exposed at the surface.

Properties and Qualities of the Ditney and Unicoi Soils

Depth class: Ditney—moderately deep; Unicoi—shallow
Drainage class: Ditney—well drained; Unicoi—somewhat excessively drained
General texture class: Ditney—loamy; Unicoi—loamy with many rock fragments
Permeability: Moderately rapid
Available water capacity: Very low
Depth to seasonal high water table: More than 6.0 feet

Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Steep
Soil slippage potential: Ditney—low; Unicoi—medium
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: About 3 percent flagstones and stones that average about 6 to 24 inches in length and are about 3 to 25 feet apart
Organic matter content of surface layer: Low to high
Potential for frost action: Moderate
Soil reaction: Extremely acid to strongly acid throughout the profile
Parent material: Residuum affected by soil creep in the upper part, weathered from low-grade metasedimentary rock
Depth to bedrock: Ditney—20 to 40 inches to hard bedrock; Unicoi—7 to 20 inches to hard bedrock
Other distinctive properties: Water movement along bedrock contacts; soils subject to downslope movement when lateral support is removed and to differential settling when used as fill material; low natural fertility

Minor Components

Dissimilar inclusions:
- Random areas of Soco and Stecoah soils that have soft bedrock at a depth of 20 to 60 inches
- Random areas of Junaluska and Brasstown soils that have more clay in the subsoil and have soft bedrock at a depth of 20 to 60 inches
- Soils that have hard bedrock at a depth of 1 to 7 inches, adjacent to rock outcrops
- Santeetlah soils that have thicker surface layers with more organic matter and have bedrock at a depth of more than 60 inches, in concave areas at the heads of drains and on footslopes
- Spivey and Northcove soils that have thicker surface layers with more organic matter, have more rock fragments in the subsoil, and have bedrock at a depth of more than 60 inches; in drainageways and below rock outcrops
- Cheoah and Jeffrey soils that have thicker surface layers with more organic matter, on north- to east-facing side slopes
- Random areas of soils on slopes of less than 30 percent or more than 50 percent
- Prominent ridges and upper side slopes that are subject to frequent rime ice in winter and damaging high winds year-round

Similar inclusions:
- Ditney soils that have surface layers of fine sandy loam or loam
- Unicoi soils that have surface layers of sandy loam or fine sandy loam

Land Use

Dominant Uses: Woodland and wildlife habitat
Other Uses: Recreation

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, depth to bedrock, and very stony surface. A site should be selected on better suited soils.

Pasture and hayland
Suitability: Pasture—poorly suited; hayland—unsuited
Management concerns:
- This map unit is severely limited for pasture and hay production because of the moderately deep and shallow rooting depths, very stony surface, and slope.

Orchard and ornamental crops
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for orchard and ornamental crops because of the slope, erodibility, depth to bedrock, and very stony surface. A site should be selected on better suited soils.

Woodland Management and Productivity

Potential for commercial species: Low for upland hardwoods and moderate for eastern white pine
Suitability: Poorly suited
Management concerns: Equipment use, erodibility, windthrow hazard, and seedling survival
Management measures and considerations:
- Using cable logging methods helps to minimize road and trail construction, especially in areas where slope exceeds 40 percent.
- The underlying bedrock may be susceptible to mass movement. An onsite investigation is needed to determine the suitability and limitations of any area within this map unit.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.
- Because of the low natural fertility and the droughty nature of the Ditney and Unicoi soils, revegetating cut and fill slopes can be difficult.
- Extensive blasting, shaping, and grading are needed if roads are to be constructed on the contour.
- Leaving a buffer zone of trees and shrubs adjacent to streams helps to minimize siltation and provides shade for the aquatic habitat.
- Livestock should not be allowed to graze in areas managed for woodland.
- Productivity is limited because of the limited rooting depth.

Urban Development

Dwellings
Suitability: Ditney—poorly suited; Unicoi—unsuited
Management concerns:
- This map unit is severely limited for dwellings because of the slope, erodibility, and depth to bedrock. A site should be selected on better suited soils.

Septic tank absorption fields
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for septic tank absorption fields because of the depth to bedrock. Contact the local Health Department for additional guidance.

Local road and streets
Suitability: Poorly suited
Management concerns: Slope, erodibility, depth to bedrock, slippage, and frost action

Management measures and considerations:
- The underlying bedrock may be susceptible to mass movement. An onsite investigation is needed to determine the suitability and limitations of any area within this map unit.
- Extensive blasting, shaping, and grading are needed if roads are to be constructed on the contour.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Because of the low natural fertility and the droughty nature of the Ditney and Unicoi soils, revegetating cut and fill slopes can be difficult.
- The permanent surfacing of roads or the use of suitable subgrade or base material allows the year-round use of roads and helps to reduce the damage from frost heave.

Lawns and landscaping
Suitability: Ditney—poorly suited; Unicoi—unsuited
Management concerns:
- This map unit is severely limited for lawns and landscaping because of the slope, erodibility, depth to bedrock, and very stony surface. A site should be selected on better suited soils.

Interpretive Groups

Land capability classification: Ditney and Unicoi—7s; Rock outcrop—8s

DtF—Ditney-Unicoi-Rock outcrop complex, 50 to 95 percent slopes, very stony

Setting

Landscape: Low and intermediate mountains, dominantly in the northwestern, north-central, and southeastern parts of the county
Elevation range: 1,080 to 4,880 feet
Landform: South- to west-facing mountain slopes
Landform position: Side slopes
Shape of areas: Irregular
Size of areas: Up to 521 acres

Map Unit Composition

Ditney soil and similar inclusions: 40 percent
Unicoi soil and similar inclusions: 35 percent
Rock outcrop: 20 percent
Dissimilar inclusions: 5 percent

Typical Profile

Ditney

Surface layer:
0 to 3 inches—brown channery sandy loam

Subsoil:
3 to 26 inches—dark yellowish brown channery fine sandy loam

Bedrock:
26 to 80 inches—unweathered, hard metagraywacke

Unicoi

Surface layer:
0 to 1 inch—dark brown channery loam
1 to 4 inches—dark yellowish brown channery fine sandy loam

Subsoil:
4 to 15 inches—dark yellowish brown very flaggy fine sandy loam

Bedrock:
15 to 80 inches—unweathered, hard metagraywacke

Rock outcrop

This part of the map unit predominantly consists of metagraywacke and quartzite bedrock exposed at the surface.

Properties and Qualities of the Ditney and Unicoi Soils

Depth class: Ditney—moderately deep; Unicoi—shallow
Drainage class: Ditney—well drained; Unicoi—somewhat excessively drained
General texture class: Ditney—loamy; Unicoi—loamy with many rock fragments
Permeability: Moderately rapid
Available water capacity: Very low
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Very steep
Soil slippage potential: Ditney—medium; Unicoi—high
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: About 3 percent flagstones and stones that average about 6 to 24 inches in length and are about 3 to 25 feet apart
Organic matter content of surface layer: Low to high
Potential for frost action: Moderate
Soil reaction: Extremely acid to strongly acid throughout the profile
Parent material: Residuum affected by soil creep in the upper part, weathered from low-grade metasedimentary rock
Depth to bedrock: Ditney—20 to 40 inches to hard bedrock; Unicoi—7 to 20 inches to hard bedrock
Other distinctive properties: Water movement along bedrock contacts; soils subject to downslope movement when lateral support is removed and to differential settling when used as fill material; low natural fertility

Minor Components

Dissimilar inclusions:
- Random areas of Soco and Stecoah soils that have soft bedrock at a depth of 20 to 60 inches
- Soils that have hard bedrock at a depth of 1 to 7 inches, adjacent to rock outcrops
- Spivey and Northcove soils that have thicker surface layers with more organic matter, have more rock fragments in the subsoil, and have bedrock at a depth of more than 60 inches; in drainageways and below rock outcrops
- Santeetlah soils that have thicker surface layers with more organic matter and have bedrock at a depth of more than 60 inches, in concave areas at the heads of drains and on footslopes

Figure 13.—An area of Ditney-Unicoi-Rock outcrop complex, 50 to 95 percent slopes, very stony. Very steep slopes and depth to bedrock limit accessibility and land use potential in areas of this map unit.

- Cheoah and Jeffrey soils that have thicker surface layers with more organic matter, on north- to east-facing side slopes
- Random areas of soils on slopes of less than 50 percent or more than 95 percent
- Areas of rubble land below rock outcrops and in drainageways
- Random areas where landslides have occurred
- Prominent ridges and upper side slopes that are subject to frequent rime ice in winter and damaging high winds year-round

Similar inclusions:
- Ditney soils that have surface layers of fine sandy loam or loam
- Unicoi soils that have surface layers of sandy loam or fine sandy loam

Land Use

Dominant Uses: Wildlife habitat (fig. 13)

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, depth to bedrock, and extent of rock outcrops. A site should be selected on better suited soils.

Pasture and hayland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for the production of pasture and hay crops because of the slope, erodibility, depth to bedrock, and extent of rock outcrops. A site should be selected on better suited soils.

Orchard and ornamental crops
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for orchard and ornamental crops because of the slope, erodibility, depth to bedrock, and extent of rock outcrops. A site should be selected on better suited soils.

Woodland Management and Productivity

Potential for commercial species: Very low
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for timber production because of the slope, erodibility, low productivity, low volume, depth to bedrock, and extent of rock outcrops. A site should be selected on better suited soils.

Urban Development

Dwellings
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for dwellings because of the slope, erodibility, depth to bedrock, and extent of rock outcrops. A site should be selected on better suited soils.

Septic tank absorption fields
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for septic tank absorption fields because of the slope, depth to bedrock, and extent of rock outcrops. Contact the local Health Department for additional guidance.

Local roads and streets
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for roads and streets because of the slope, erodibility, depth to bedrock, and extent of rock outcrops. A site should be selected on better suited soils.

Lawns and landscaping
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for lawns and landscaping because of the slope, erodibility, depth to bedrock, and extent of rock outcrops. A site should be selected on better suited soils.

Interpretive Groups

Land capability classification: Ditney and Unicoi—7s; Rock outcrop—8s

EtA—Ela silt loam, 0 to 2 percent slopes, occasionally flooded

Setting

Landscape: Mountain valleys of low and intermediate mountains, dominantly near Robbinsville and the Yellow Creek area in the central and northern parts of the county
Elevation range: 1,460 to 2,360 feet
Landform: Flood plains
Landform position: Planar to slightly concave bottomland slopes
Shape of areas: Irregular
Size of areas: Up to 68 acres

Map Unit Composition

Ela soil and similar inclusions: 90 percent
Dissimilar inclusions: 10 percent

Typical Profile

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 16 inches—black silt loam

Underlying material:
16 to 32 inches—dark grayish brown fine sandy loamy with mottles in shades of red and gray
32 to 80 inches—dark grayish brown extremely cobbly sandy loam

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Poorly drained
General texture class: Loamy in the upper part and sandy-skeletal in the lower part
Permeability: Moderately rapid in the surface horizon and the upper portion of the underlying material and rapid in the lower portion
Available water capacity: Low
Depth to seasonal high water table: 1.0 foot or less from December through May and 0.5 foot to 1.5 feet from June through November
Hazard of flooding: Occasional, throughout the year with standing water for less than 2 days
Shrink-swell potential: Low
Slope class: Nearly level
Soil slippage potential: None
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: None or slight
Organic matter content of surface layer: High or very high
Potential for frost action: Moderate
Special climatic conditions: Soil subject to slow air drainage, which allows late spring and early fall frosts
Soil reaction: Very strongly acid to slightly acid throughout the profile
Parent material: Alluvium derived from low-grade metasedimentary rock
Depth to bedrock: More than 60 inches
Depth to contrasting material: 20 to 40 inches to deposits of gravel and cobbles that are stratified with sandy or loamy material

Other distinctive properties: Soil subject to ponding for brief periods throughout the year; soil subject to overland flow of storm water from adjacent uplands

Minor Components

Dissimilar inclusions:
- Somewhat poorly drained Cullowhee soils, in the slightly higher-lying positions
- Soils that have strata with a high content of rock fragments at a depth of more than 40 inches, in the slightly higher-lying positions
- Soils that are rarely flooded, on adjacent toeslopes
- Poorly drained soils that have clayey subsoils, in low-lying depressions in backwater areas
- Random areas of soils on slopes of more than 2 percent

Similar inclusions:
- Ela soils that have surface layers of loam or fine sandy loam

Land Use

Dominant Uses: Pasture
Other Uses: Cropland, hayland, and wildlife habitat

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the wetness and flooding. A site should be selected on better suited soils.

Pasture and hayland
Suitability: Poorly suited
Management concerns: Flooding, wetness, pesticide retention, soil fertility, nutrient leaching, and erodibility
Management measures and considerations:
- While most flooding occurs during the winter months, there is a risk of crop loss during the growing season.
- Maintaining existing drainageways and ditches helps to remove excess water.
- This soil may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using split applications helps to increase the effectiveness of lime and fertilizer and helps to avoid the leaching of plant nutrients below the rooting zone and into the water table.
- Using rotational grazing, implementing a well planned harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.
- Fencing livestock away from creeks and streams helps to prevent streambank erosion and sedimentation.

Orchard and ornamental crops
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for orchard and ornamental crops because of the wetness and flooding. A site should be selected on better suited soils.

Woodland Management and Productivity

Potential for commercial species: Very low woodland productivity
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for timber production because of the wetness and flooding. A site should be selected on better suited soils.

Urban Development

Dwellings
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for dwellings because of the flooding and wetness. A site should be selected on better suited soils.

Septic tank absorption fields
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for septic tank absorption fields because of the flooding, wetness, and poor filtering capacity. Contact the local Health Department for additional guidance.

Local roads and streets
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for roads and streets because of the wetness and flooding. A site should be selected on better suited soils.

Lawns and landscaping
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for lawns and landscaping because of the wetness and flooding. A site should be selected on better suited soils.

Interpretive Groups

Land capability classification: 7w

FvA—Fluvaquents, ponded, 0 to 3 percent slopes, frequently flooded

Setting

Landscape: Mountains valleys of low and intermediate mountains at the head of Tallulah Creek in the southeastern part of the county
Elevation range: 2,580 to 2,650 feet
Landform: Flood plains
Landform position: Planar to slightly concave bottomland slopes
Shape of areas: Long and narrow
Size of areas: Up to 104 acres

Map Unit Composition

Fluvaquents and similar inclusions: 90 percent
Dissimilar inclusions: 10 percent

Typical Profile

This map unit consists of low-lying, disturbed cut and fill areas where soil and the underlying material has been removed and placed on an adjacent site. Areas include former golf course fairways, golf cart paths, building sites, and abandoned pond sites. Also included are depressions filled with construction debris and covered with soil material. These areas were reclaimed for wetland mitigation and are subject to scouring and deposition during flooding. A typical profile is not given due to the variable nature of the soil.

Soil Properties and Qualities

Note: Properties are variable and dependent on the type of fill material used and the extent of disturbance by flooding. An onsite investigation is needed to determine the suitability and limitations of any area within this map unit.

Depth class: Very deep
Drainage class: Very poorly drained or poorly drained
General texture class: Loamy to a depth of 40 to more than 60 inches over deposits of gravel and cobbles that are stratified with sandy and loamy material
Permeability: Moderate
Available water capacity: Low or moderate
Depth to seasonal high water table: Variable; occasionally 3 to 6 feet and more commonly 1.0 foot or less from December through May and 0.5 foot to 1.5 feet from June through November
Hazard of flooding: Frequent, throughout the year with standing water for less than 2 days
Shrink-swell potential: Low
Slope class: Nearly level or gently sloping
Soil slippage potential: None
Extent of erosion: None to moderate
Hazard of water erosion: None to severe
Organic matter content of surface layer: Low
Potential for frost action: Moderate
Special climatic conditions: Soils subject to slow air drainage, which allows late spring and early fall frosts
Soil reaction: Very strongly acid to slightly acid throughout the profile, except where surface layers have been limed
Parent material: Loamy fill material
Depth to bedrock: More than 60 inches
Depth to contrasting material: 40 to more than 60 inches to deposits of gravel and cobbles that are stratified with sandy or loamy material
Other distinctive properties: Potential for differential settling; soils subject to overland flow of storm water from adjacent uplands; soils subject to scouring and deposition during flooding; soils subject to ponding throughout the year

Minor Components

Dissimilar inclusions:
- Areas that are occasionally flooded or rarely flooded for very brief periods
- Udorthents, loamy, rarely flooded, along the edges of map unit delineations
- Random areas of somewhat poorly drained Cullowhee and poorly drained Ela soils that are loamy in the upper part and are 20 to 40 inches deep to strata with a high content of rock fragments
- Areas of poorly drained Hemphill soils along the edges of map unit delineations

- Random areas of moderately well drained Dellwood and Reddies soils that are loamy in the upper part and have strata with a high content of rock fragments at a depth of 8 to 40 inches
- Areas of well drained Northcove and Lonon soils which have strata with a high content of rock fragments at a depth of 8 to more than 40 inches, along the edges of map unit delineations
- Random areas of soils on slopes of more than 3 percent

Similar inclusions:
- Soils that are similar to Fluvaquents but have sandy or clayey underlying material

Land Use

Dominant Uses: Wildlife habitat and wetland mitigation

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the wetness and flooding. A site should be selected on better suited soils.

Pasture and hayland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for pasture and hayland production because of the wetness and flooding. A site should be selected on better suited soils.

Orchard and ornamental crops
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for orchard and ornamental crops because of the wetness and flooding. A site should be selected on better suited soils.

Woodland Management and Productivity

Potential for commercial species: Very low
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for timber production because of the wetness and flooding. A site should be selected on better suited soils.

Urban Development

Dwellings
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for dwellings because of the flooding and wetness. A site should be selected on better suited soils.

Septic tank absorption fields
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for septic tank absorption fields because of the wetness, poor filtering capacity, and flooding. A site should be selected on better suited soils.

Local roads and streets
Suitability: Unsuited

Management concerns:
- This map unit is severely limited for roads and streets because of the flooding and wetness. A site should be selected on better suited soils.

Lawns and landscaping
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for lawns and landscaping because of the wetness and flooding. A site should be selected on better suited soils.

Interpretive Groups

Land capability classification: 8w

HcD—Heintooga-Chiltoskie complex, 15 to 30 percent slopes, bouldery

Setting

Landscape: High mountains in the western and eastern parts of the county
Elevation range: 4,350 to 5,350 feet
Landform: Coves and drainageways
Landform position: Head slopes, footslopes, and toeslopes
Shape of areas: Irregular or long and narrow
Size of areas: Up to 114 acres

Map Unit Composition

Heintooga soil and similar inclusions: 55 percent
Chiltoskie soil and similar inclusions: 35 percent
Dissimilar inclusions: 10 percent

Typical Profile

Heintooga

Surface layer:
0 to 11 inches—dark brown very flaggy loam

Subsoil:
11 to 25 inches—brown extremely channery fine sandy loam
25 to 80 inches—yellowish brown extremely flaggy coarse sandy loam

Chiltoskie

Surface layer:
0 to 7 inches—very dark brown loam

Subsoil:
7 to 41 inches—dark yellowish brown loam
41 to 80 inches—yellowish brown very channery sandy loam

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
General texture class: Heintooga—loamy with many rock fragments; Chiltoskie—loamy
Permeability: Moderately rapid
Available water capacity: Low
Depth to seasonal high water table: More than 6.0 feet

Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Moderately steep
Soil slippage potential: None
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: Widely scattered stones and boulders that average about 15 to 48 inches in length and are about 25 to 75 feet apart
Organic matter content of surface layer: Very high
Potential for frost action: Moderate
Special climatic conditions: Soils subject to prolonged freezing temperatures and rime ice in winter, high rainfall, and a short growing season
Soil reaction: Heintooga—ultra acid to strongly acid throughout; Chiltoskie—extremely acid to strongly acid throughout
Parent material: Colluvium derived from low-grade metamorphic rock
Depth to bedrock: More than 60 inches
Other distinctive properties: Random areas of seeps and springs; soils subject to overland flow of storm water from adjacent uplands; a high content of rock fragments in the Heintooga soil

Minor Components

Dissimilar inclusions:
- Areas of rubble land in drainageways
- Soils that have a seasonal high water table at a depth of less than 6.0 feet, in depressions and on toeslopes
- Soils that have bedrock at a depth of less than 6.0 feet, in drainageways and on the outer edge of map unit delineations
- Random areas of soils on slopes of less than 15 percent or more than 30 percent
- Unprotected areas that are windswept

Similar inclusions:
- Heintooga and Chiltoskie soils that have surface layers of sandy loam or fine sandy loam

Land Use

Dominant Uses: Wildlife habitat and recreation

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, bouldery surface, and short growing season. A site on better suited soils should be selected.

Pasture and hayland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for the production of pasture and hay crops because of the bouldery surface and short growing season. A site on better suited soils should be selected.

Orchards and ornamental crops
Suitability: Unsuited

Management concerns:
- This map unit is severely limited for orchards and ornamental crops because of the bouldery surface and short growing season. A site on better suited soils should be selected.

Woodland Management and Productivity

Potential for commercial species: Not used
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for timber production because of the bouldery surface, short growing season, and low productivity. A site on better suited soils should be selected.

Urban Development

Dwellings

Suitability: Heintooga—unsuited; Chiltoskie—poorly suited
Management concerns:
- This map unit is not managed for dwellings.

Septic tank absorption fields

Suitability: Heintooga—unsuited; Chiltoskie—poorly suited
Management concerns:
- This map unit is not managed for septic tank absorption fields.

Local roads and streets

Suitability: Poorly suited
Management concerns: Heintooga—slope, erodibility, large stones, seeps and springs, frost action, and differential settling; Chiltoskie—slope, erodibility, large stones, seeps and springs, and frost action
Management measures and considerations:
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Large stones and boulders will be encountered during excavation.
- Intercepting and diverting underground water from seeps and springs helps to stabilize cut and fill slopes.
- The permanent surfacing of roads or the use of suitable subgrade or base material allows the year-round use of roads and helps to minimize the damage from frost heaving.
- The Heintooga soil is subject to uneven settling and may be unstable if not properly compacted.
- Incorporating sand and gravel into the soil, compacting roadbeds, and designing roads so that they conform to the natural slope help to improve soil strength.

Lawns and landscaping

Suitability: Poorly suited
Management concerns:
- This map unit is not managed for lawns and landscaping.

Interpretive Groups

Land capability classification: Heintooga—6s; Chiltoskie—4c

HdE—Heintooga-Chiltoskie complex, 30 to 50 percent slopes, very bouldery

Setting

Landscape: High mountains in the western and eastern parts of the county
Elevation range: 4,400 to 5,430 feet
Landform: Coves and drainageways
Landform position: Head slopes, footslopes, and toeslopes
Shape of areas: Irregular or long and narrow
Size of areas: Up to 34 acres

Map Unit Composition

Heintooga soil and similar inclusions: 55 percent
Chiltoskie soil and similar inclusions: 35 percent
Dissimilar inclusions: 10 percent

Typical Profile

Heintooga

Surface layer:
0 to 11 inches—dark brown very flaggy loam

Subsoil:
11 to 25 inches—brown extremely channery fine sandy loam
25 to 80 inches—yellowish brown extremely flaggy coarse sandy loam

Chiltoskie

Surface layer:
0 to 7 inches—very dark brown loam

Subsoil:
7 to 41 inches—dark yellowish brown loam
41 to 80 inches—yellowish brown very channery sandy loam

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
General texture class: Heintooga—loamy with many rock fragments; Chiltoskie—loamy
Permeability: Moderately rapid
Available water capacity: Low
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Steep
Soil slippage potential: Heintooga—medium; Chiltoskie—low
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: About 3 percent stones and boulders that average about 15 to 48 inches in length and are about 10 to 65 feet apart
Organic matter content of surface layer: Very high
Potential for frost action: Moderate
Special climatic conditions: Soils subject to prolonged freezing temperatures and rime ice in winter, high rainfall, and a short growing season

Soil reaction: Heintooga—ultra acid to strongly acid throughout; Chiltoskie—extremely acid to strongly acid throughout
Parent material: Colluvium derived from low-grade metamorphic rock
Depth to bedrock: More than 60 inches
Other distinctive properties: Random areas of seeps and springs; soils subject to overland flow of storm water from adjacent uplands; soil slippage potential when soils are saturated; a high content of rock fragments in the Heintooga soil

Minor Components

Dissimilar inclusions:
- Areas of rubble land below rock outcrops and in drainageways
- Random areas of soils that have more clay in the subsoil
- Soils that are poorly drained, in areas of seeps and springs
- Soils that have a seasonal high water table at a depth of less than 6.0 feet, in depressions and on toeslopes
- Soils that have bedrock at a depth of less than 6.0 feet, in drainageways and on the outer edge of map unit delineations
- Random areas of soils on slopes of less than 30 percent or more than 50 percent
- Unprotected areas that are windswept

Similar inclusions:
- Heintooga and Chiltoskie soils that have surface layers of sandy loam or fine sandy loam

Land Use

Dominant Uses: Wildlife habitat and recreation

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, very bouldery surface, and short growing season. A site on better suited soils should be selected.

Pasture and hayland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for the production of pasture and hay crops because of the very bouldery surface and short growing season. A site on better suited soils should be selected.

Orchards and ornamental crops
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for orchards and ornamental crops because of the very bouldery surface and short growing season. A site on better suited soils should be selected.

Woodland Management and Productivity

Potential for commercial species: Not used
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for timber production because of the very bouldery surface, short growing season, and low productivity. A site on better suited soils should be selected.

Urban Development

Dwellings
Suitability: Heintooga—unsuited; Chiltoskie—poorly suited
Management concerns:
- This map unit is not managed for dwellings.

Septic tank absorption fields
Suitability: Heintooga—unsuited; Chiltoskie—poorly suited
Management concerns:
- This map unit is not managed for septic tank absorption fields.

Local roads and streets
Suitability: Poorly suited
Management concerns: Heintooga—slope, erodibility, large stones, seeps and springs, frost action, and differential settling; Chiltoskie—slope, erodibility, large stones, seeps and springs, and frost action
Management measures and considerations:
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Large stones and boulders will be encountered during excavation.
- Intercepting and diverting underground water from seeps and springs helps to stabilize cut and fill slopes.
- The permanent surfacing of roads or the use of suitable subgrade or base material allows the year-round use of roads and helps to minimize the damage from frost heaving.
- The Heintooga soil is subject to uneven settling and may be unstable if not properly compacted.
- Incorporating sand and gravel into the soil, compacting roadbeds, and designing roads so that they conform to the natural slope help to improve soil strength.

Lawns and landscaping
Suitability: Poorly suited
Management concerns:
- This map unit is not managed for lawns and landscaping.

Interpretive Groups

Land capability classification: 7s

HmA—Hemphill loam, 0 to 3 percent slopes, rarely flooded

Setting

Landscape: Mountains valleys of intermountain hills and low and intermediate mountains, dominantly near Robbinsville and along Tallulah and Sweetwater Creeks, in the central and southeastern parts of the county
Elevation range: 1,830 to 2,620 feet
Landform: Low stream terraces
Landform position: Planar to slightly concave bottomland slopes
Shape of areas: Irregular
Size of areas: Up to 28 acres

Map Unit Composition

Hemphill soil and similar inclusions: 80 percent
Dissimilar inclusions: 20 percent

Typical Profile

Surface layer:
0 to 11 inches—very dark brown loam

Subsoil:
11 to 34 inches—light gray clay loam
34 to 80 inches—light gray clay loam with mottles in shades of strong brown

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Very poorly drained
General texture class: Clayey
Permeability: Moderately slow in the surface horizon, slow in the subsoil, and moderate in the underlying material
Available water capacity: High
Depth to seasonal high water table: 1.0 foot or less from December through May and 0.5 foot to 1.5 feet from June through November
Hazard of flooding: Rare, throughout the year with standing water for less than 2 days
Shrink-swell potential: Low
Slope class: Nearly level
Soil slippage potential: None
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: None or slight
Organic matter content of surface layer: High
Potential for frost action: Moderate
Special climatic conditions: Soil subject to slow air drainage, which allows late spring and early fall frosts
Soil reaction: Very strongly acid to neutral throughout the profile
Parent material: Alluvium derived from low-grade metasedimentary rock
Depth to bedrock: More than 60 inches
Other distinctive properties: Random areas of seeps and springs; soil subject to overland flow of storm water from adjacent uplands

Minor Components

Dissimilar inclusions:
- Moderately well drained Dillard soils that have less clay in the subsoil, on low stream terraces and toeslopes
- Thurmont soils that have a water table at a depth of 40 to 60 inches, on toeslopes
- Well drained soils that have loamy subsoils, along stream channels
- Somewhat poorly drained Cullowhee soils that have less clay in the subsoil, along stream channels
- Well drained Statler soils on low terraces
- Random areas of soils on slopes of more than 3 percent

Similar inclusions:
- Hemphill soils that have surface layers of clay loam

Land Use

Dominant Uses: Pasture and hayland
Other Uses: Cropland and wildlife habitat

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the wetness and flooding. A site should be selected on better suited soils.

Pasture and hayland
Suitability: Poorly suited
Management concerns: Flooding, wetness, pesticide retention, soil fertility, nutrient leaching, and erodibility
Management measures and considerations:
- While most flooding occurs during the winter months, there is a risk of crop loss during the growing season.
- Maintaining existing drainageways and ditches helps to remove excess water.
- This soil may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer and the clay content of the subsoil. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using split applications helps to increase the effectiveness of lime and fertilizer and helps to avoid the leaching of plant nutrients below the rooting zone and into the water table.
- Using rotational grazing, implementing a well planned harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.
- Fencing livestock away from creeks and streams helps to prevent streambank erosion and sedimentation.

Orchard and ornamental crops
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for orchard and ornamental crops because of the wetness and flooding. A site should be selected on better suited soils.

Woodland Management and Productivity

Potential for commercial species: Very low
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for timber production because of the wetness and flooding. A site should be selected on better suited soils.

Urban Development

Dwellings
Suitability: Unsuited

Management concerns:
- This map unit is severely limited for dwellings because of the flooding and wetness. A site should be selected on better suited soils.

Septic tank absorption fields
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for septic tank absorption fields because of the flooding and wetness. Contact the local Health Department for additional guidance.

Local roads and streets
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for roads and streets because of the wetness and flooding. A site should be selected on better suited soils.

Lawns and landscaping
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for lawns and landscaping because of the wetness and flooding. A site should be selected on better suited soils.

Interpretive Groups

Land capability classification: 4w

JbC—Junaluska-Brasstown complex, 8 to 15 percent slopes

Setting

Landscape: Low and intermediate mountains and intermountain hills, dominantly in the central and northern parts of the county
Elevation range: 1,810 to 2,580 feet
Landform: Ridges
Landform position: Summits
Shape of areas: Long and narrow
Size of areas: Up to 42 acres

Map Unit Composition

Junaluska soil and similar inclusions: 50 percent
Brasstown soil and similar inclusions: 40 percent
Dissimilar inclusions: 10 percent

Typical Profile

Junaluska

Surface layer:
0 to 2 inches—moderately decomposed plant material
2 to 4 inches—brown fine sandy loam
4 to 11 inches—strong brown fine sandy loam

Subsoil:
11 to 21 inches—yellowish red sandy clay loam

Underlying material:
21 to 26 inches—yellowish red and red fine sandy loam saprolite

Bedrock:
26 to 80 inches—weathered metasandstone

Brasstown

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 6 inches—dark brown channery fine sandy loam

Subsoil:
6 to 10 inches—yellowish red channery clay loam
10 to 29 inches—red channery sandy clay loam
29 to 37 inches—red channery fine sandy loam

Underlying material:
37 to 46 inches—channery very fine sandy loam saprolite multicolored in shades of red and brown

Bedrock:
46 to 80 inches—weathered, interbedded metasandstone and phyllite

Soil Properties and Qualities

Depth class: Junaluska—moderately deep; Brasstown—deep
Drainage class: Well drained
General texture class: Loamy
Permeability: Moderate
Available water capacity: Junaluska—low; Brasstown—moderate
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Strongly sloping
Soil slippage potential: None
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Severe
Organic matter content of surface layer: Low to high
Potential for frost action: Moderate
Soil reaction: Extremely acid to moderately acid throughout the profile
Parent material: Residuum weathered from low-grade metasedimentary rock
Depth to bedrock: Junaluska—20 to 40 inches; Brasstown—40 to 60 inches to soft bedrock

Minor Components

Dissimilar inclusions:
- Random areas of Soco and Stecoah soils that have less clay in the subsoil and have soft bedrock at a depth of 20 to 60 inches
- Random areas of Tsali soils that have soft bedrock at a depth of 10 to 20 inches
- Random areas of soils that have clayey subsoils and have bedrock at a depth of 40 to more than 60 inches
- Random areas of soils that have more mica in the subsoil and have bedrock at a depth of 20 to more than 60 inches
- Random areas of severely eroded soils where underlying material is exposed at the surface

- Lonon soils that have thick surface layers with more organic matter and have bedrock at a depth of more than 60 inches, in saddles and gaps and in concave areas at the head of drains
- Thurmont soils that have a water table at a depth of 40 to 60 inches, in depressions and drainageways
- Random areas of soils on slopes of less than 8 percent or more than 15 percent

Similar inclusions:
- Junaluska and Brasstown soils that have surface layers of sandy loam or loam

Land Use

Dominant Uses: Building site development, pasture, and hayland
Other Uses: Cropland and woodland

Agricultural Development

Cropland
Suitability: Suited
Management concerns: Junaluska—equipment use, erodibility, tilth, soil fertility, rooting depth, and droughtiness; Brasstown—equipment use, erodibility, tilth, soil fertility, and rooting depth
Management measures and considerations:
- Using conservation practices, such as contour farming, winter cover crops, and crop rotations which include grasses and legumes, helps to minimize soil erosion, maximize the infiltration of rainfall, increase the available water capacity, and improve soil fertility.
- The slope may limit equipment use in the steeper areas.
- Avoiding tillage during wet periods, incorporating crop residue into the soil, or leaving residue on the soil surface helps to minimize clodding and crusting and increases the infiltration of rainfall.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes crop productivity.
- Because of the low available water capacity due to the moderately deep rooting depth, the Junaluska soil is difficult to manage for cultivated crops.

Pasture and hayland
Suitability: Well suited
Management concerns: Junaluska—equipment use, erodibility, soil fertility, rooting depth, and droughtiness; Brasstown—equipment use, erodibility, soil fertility, and rooting depth
Management measures and considerations:
- The slope may limit the use of equipment in the steeper areas when harvesting hay crops.
- Growing adapted plants helps to ensure the production of high-quality forage and minimize soil erosion.
- Preparing seedbeds on the contour or across the slope helps to minimize soil erosion and increases germination.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using rotational grazing, implementing a well planned harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.

- Because of the low available water capacity due to the moderately deep rooting depth, the Junaluska soil is difficult to manage for the production of pasture and hay crops.

Orchard and ornamental crops

Suitability: Junaluska—poorly suited; Brasstown—suited

Management concerns: Junaluska—equipment use, erodibility, soil fertility, ball and burlap harvesting, plant shape, rooting depth, and droughtiness; Brasstown—equipment use, erodibility, soil fertility, ball and burlap harvesting, plant shape, and rooting depth

Management measures and considerations:

- Establishing and maintaining sod between rows and on access roads helps to reduce the hazard of erosion.
- The slope may limit equipment use in the steeper areas.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximize productivity.
- Avoiding ball and burlap harvesting during dry periods helps to prevent fracture of the ball and separation of the soil from the roots caused by a low moisture content and a minimal clay content.
- The slope affects the shape of ornamentals on the uphill side.
- Because of the restricted movement of air and water due to the clay content of the subsoil, phytophthora root disease is a potential limitation for Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of the low available water capacity and windthrow hazard due to the moderately deep rooting depth, the Junaluska soil is difficult to manage for orchard and ornamental crops.

Woodland Management and Productivity

Potential for commercial species: Low or moderate for upland hardwoods and high for eastern white pine

Suitability: Suited

Management concerns: Junaluska—equipment use, erodibility, rooting depth, and windthrow hazard; Brasstown—equipment use, erodibility, and rooting depth

Management measures and considerations:

- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.
- Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
- When the soil is wet, skid trails and unsurfaced roads are highly erodible and very slick due to the silt and clay content in the subsoil.
- Avoiding logging operations during periods when the soil is saturated helps to prevent rutting of the soil surface and damage to tree roots due to soil compaction.
- Leaving a buffer zone of trees and shrubs adjacent to streams helps to minimize siltation and provides shade for the aquatic habitat.
- Livestock should not be allowed to graze in areas managed for woodland.
- Using improved varieties of eastern white pine helps to increase productivity.

Figure 14.—Housing in an area of Junaluska-Brasstown complex, 8 to 15 percent slopes, is in the foreground. This map unit is better suited to the construction of homes than areas of Ditney-Unicoi-Rock outcrop complex, 50 to 95 percent slopes, very stony, in the background.

- Replanting may be necessary on warm, south- to west-facing slopes because of reduced soil moisture. Planting when the soil is moist for extended periods helps to increase seedling survival rates.
- Productivity is limited in areas of the Junaluska soil because of the limited rooting depth.

Urban Development

Dwellings

Suitability: Suited (fig. 14)
Management concerns: Slope, erodibility, corrosivity, and depth to bedrock
Management measures and considerations:
- Designing structures on the contour with the natural slope or building in less sloping areas helps to improve soil performance.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
- Using corrosion-resistant materials helps to reduce the risk of damage to uncoated steel and concrete.
- The soil is slippery and sticky when wet and slow to dry.
- The soft bedrock in these soils should not be difficult to excavate but will be difficult to vegetate and pack into a fill slope.

Septic tank absorption fields

Suitability: Poorly suited
Management concerns: Slope and depth to bedrock

Management measures and considerations:
- Contact the local Health Department for guidance on sanitary facilities.
- Installing distribution lines on the contour helps to improve the performance of septic tank absorption fields.
- Locating and using areas of the deeper Brasstown soil may improve the performance of filter fields.
- Raking trench walls helps to prevent the sealing of soil pores which may occur during the excavation of septic tank absorption fields.
- Increasing the size of the septic tank absorption field helps to improve performance.

Local roads and streets
Suitability: Suited
Management concerns: Slope, low strength, erodibility, depth to bedrock, and frost action
Management measures and considerations:
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
- Incorporating sand and gravel into the soil, compacting roadbeds, and designing roads that conform to natural slopes help to improve soil strength.
- The soft bedrock in these soils should not be difficult to excavate but will be difficult to vegetate and pack into a fill slope.
- The permanent surfacing of roads or the use of suitable subgrade or base material allows the year-round use of roads and helps to reduce the damage from frost heaving.

Lawns and landscaping
Suitability: Suited
Management concerns: Junaluska—slope, erodibility, soil fertility, depth to bedrock, and droughtiness; Brasstown—slope, erodibility, soil fertility, and depth to bedrock
Management measures and considerations:
- Designing plantings on natural contours helps to increase water infiltration.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Avoiding the use of heavy equipment in areas to be landscaped helps to prevent soil compaction.
- Topsoil should be stockpiled from disturbed areas and replaced before landscaping.
- The soil is slippery and sticky when wet and slow to dry.
- Using lime, fertilizer, mulch, and irrigation helps to establish lawns and landscape plants.
- Because of the restricted movement of air and water due to the clay content of the subsoil, phytophthora root disease is a potential limitation for Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of the moderately deep rooting depth, the Junaluska soil is difficult to manage for lawns and landscaping, especially if the soil has been disturbed.
- If excavated material is to be used for landscaping, any soft bedrock will need to be crushed or removed.

Interpretive Groups

Land capability classification: 3e

JbD—Junaluska-Brasstown complex, 15 to 30 percent slopes

Setting

Landscape: Low and intermediate mountains and intermountain hills, dominantly in the central and northern parts of the county
Elevation range: 1,420 to 3,900 feet
Landform: Ridges and mountain slopes
Landform position: Summits and side slopes
Shape of areas: Long and narrow on summits and irregular on side slopes
Size of areas: Up to 227 acres

Map Unit Composition

Junaluska soil and similar inclusions: 50 percent
Brasstown soil and similar inclusions: 40 percent
Dissimilar inclusions: 10 percent

Typical Profile

Junaluska

Surface layer:
0 to 2 inches—moderately decomposed plant material
2 to 4 inches—brown fine sandy loam
4 to 11 inches—strong brown fine sandy loam

Subsoil:
11 to 21 inches—yellowish red sandy clay loam

Underlying material:
21 to 26 inches—yellowish red and red fine sandy loam saprolite

Bedrock:
26 to 80 inches—weathered metasandstone

Brasstown

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 6 inches—dark brown channery fine sandy loam

Subsoil:
6 to 10 inches—yellowish red channery clay loam
10 to 29 inches—red channery sandy clay loam
29 to 37 inches—red channery fine sandy loam

Underlying material:
37 to 46 inches—channery very fine sandy loam saprolite multicolored in shades of red and brown

Bedrock:
46 to 80 inches—weathered, interbedded metasandstone and phyllite

Soil Properties and Qualities

Depth class: Junaluska—moderately deep; Brasstown—deep

Drainage class: Well drained
General texture class: Loamy
Permeability: Moderate
Available water capacity: Junaluska—low; Brasstown—moderate
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Moderately steep
Soil slippage potential: None
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Organic matter content of surface layer: Low to high
Potential for frost action: Moderate
Soil reaction: Extremely acid to moderately acid throughout the profile
Parent material: Residuum weathered from low-grade metasedimentary rock
Depth to bedrock: Junaluska—20 to 40 inches; Brasstown—40 to 60 inches to soft bedrock

Minor Components

Dissimilar inclusions:
- Random areas of Soco and Stecoah soils that have less clay in the subsoil and have soft bedrock at a depth of 20 to 60 inches
- Random areas of Tsali soils that have soft bedrock at a depth of 10 to 20 inches
- Random areas of soils that have more mica in the subsoil and have bedrock at a depth of 20 to more than 60 inches
- Random areas of severely eroded soils where underlying material is exposed at the surface
- Lonon soils that have thick surface layers with more organic matter and have bedrock at a depth of more than 60 inches, in saddles and gaps and in concave areas at the head of drains
- Thurmont soils that have a water table at a depth of 40 to 60 inches, in depressions and drainageways
- Random areas of soils on slopes of less than 15 percent or more than 30 percent

Similar inclusions:
- Junaluska and Brasstown soils that have surface layers of sandy loam or loam

Land Use

Dominant Uses: Pasture, hayland, and building site development
Other Uses: Woodland, wildlife habitat, cropland, and recreation

Agricultural Development

Cropland

Suitability: Poorly suited
Management concerns: Junaluska—equipment use, erodibility, tilth, soil fertility, rooting depth, and droughtiness; Brasstown—equipment use, erodibility, tilth, soil fertility, and rooting depth
Management measures and considerations:
- These soils are difficult to manage for cultivated crops because the slope limits equipment use.
- Using conservation practices, such as contour farming, winter cover crops, and crop rotations which include grasses and legumes, helps to minimize soil erosion,

maximize the infiltration of rainfall, increase the available water capacity, and improve soil fertility.
- Avoiding tillage during wet periods, incorporating crop residue into the soil, or leaving residue on the soil surface helps to minimize clodding and crusting and increases the infiltration of rainfall.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes crop productivity.
- Because of the low available water capacity due to the moderately deep rooting depth, the Junaluska soil is difficult to manage for cultivated crops.

Pasture and hayland
Suitability: Suited
Management concerns: Junaluska—equipment use, erodibility, soil fertility, rooting depth, and droughtiness; Brasstown—equipment use, erodibility, soil fertility, and rooting depth
Management measures and considerations:
- The slope limits the use of equipment in the steeper areas.
- Growing adapted plants helps to ensure the production of high-quality forage and minimize soil erosion.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using rotational grazing, implementing a well planned harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.
- Because of the low available water capacity due to the moderately deep rooting depth, the Junaluska soil is difficult to manage for the production of pasture and hay crops.

Orchard and ornamental crops
Suitability: Junaluska—poorly suited; Brasstown—suited
Management concerns: Junaluska—equipment use, erodibility, soil fertility, ball and burlap harvesting, plant shape, rooting depth, and droughtiness; Brasstown—equipment use, erodibility, soil fertility, ball and burlap harvesting, plant shape, and rooting depth
Management measures and considerations:
- These soils may be difficult to manage for orchard or ornamental crops because the slope limits equipment use.
- Establishing and maintaining sod between rows and on access roads helps to reduce the hazard of erosion.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximize productivity.
- Avoiding ball and burlap harvesting during dry periods helps to prevent fracture of the ball and separation of the soil from the roots caused by a low moisture content and a minimal clay content.
- The slope affects the shape of ornamentals on the uphill side.
- Because of the restricted movement of air and water due to the clay content of the subsoil, phytophthora root disease is a potential limitation for Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of the low available water capacity and windthrow hazard due to the moderately deep rooting depth, the Junaluska soil is difficult to manage for orchard and ornamental crops.

Woodland Management and Productivity

Potential for commercial species: Low or moderate for upland hardwoods and high for eastern white pine
Suitability: Suited
Management concerns: Junaluska—equipment use, erodibility, rooting depth, and windthrow hazard; Brasstown—equipment use, erodibility, and rooting depth
Management measures and considerations:
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.
- Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
- When the soil is wet, skid trails and unsurfaced roads are highly erodible and very slick due to the silt and clay content in the subsoil.
- Avoiding logging operations during periods when the soil is saturated helps to prevent rutting of the soil surface and damage to tree roots due to soil compaction.
- Livestock should not be allowed to graze in areas managed for woodland.
- Productivity is limited in areas of the Junaluska soil because of the limited rooting depth.

Urban Development

Dwellings
Suitability: Poorly suited
Management concerns: Slope, erodibility, corrosivity, and depth to bedrock
Management measures and considerations:
- Designing structures on the contour with the natural slope or building in less sloping areas helps to improve soil performance.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
- Using corrosion-resistant materials helps to reduce the risk of damage to uncoated steel and concrete.
- The soft bedrock in these soils should not be difficult to excavate but will be difficult to vegetate and pack into a fill slope.

Septic tank absorption fields
Suitability: Poorly suited
Management concerns: Slope and depth to bedrock
Management measures and considerations:
- Contact the local Health Department for guidance on sanitary facilities.
- Installing distribution lines on the contour helps to improve the performance of septic tank absorption fields.
- Locating and using areas of the deeper Brasstown soil may improve the performance of filter fields.
- Raking trench walls helps to prevent the sealing of soil pores which may occur during the excavation of septic tank absorption fields.

Local roads and streets
Suitability: Poorly suited

Management concerns: Slope, low strength, erodibility, depth to bedrock, and frost action
Management measures and considerations:
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
- Incorporating sand and gravel into the soil, compacting roadbeds, and designing roads that conform to natural slopes help to improve soil strength.
- The soft bedrock in these soils should not be difficult to excavate but will be difficult to vegetate and pack into a fill slope.
- The permanent surfacing of roads or the use of suitable subgrade or base material allows the year-round use of roads and helps to reduce the damage from frost heaving.

Lawns and landscaping
Suitability: Poorly suited
Management concerns: Junaluska—slope, erodibility, soil fertility, depth to bedrock, and droughtiness; Brasstown—slope, erodibility, soil fertility, and depth to bedrock
Management measures and considerations:
- Designing plantings on natural contours helps to increase water infiltration.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Avoiding the use of heavy equipment in areas to be landscaped helps to prevent soil compaction.
- Topsoil should be stockpiled from disturbed areas and replaced before landscaping.
- Using lime, fertilizer, mulch, and irrigation helps to establish lawns and landscape plants.
- Because of the restricted movement of air and water due to the clay content of the subsoil, phytophthora root disease is a potential limitation for Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of the moderately deep rooting depth, the Junaluska soil is difficult to manage for lawns and landscaping, especially if the soil has been disturbed.
- If excavated material is to be used for landscaping, any soft bedrock will need to be crushed or removed.

Interpretive Groups

Land capability classification: 4e

JbE—Junaluska-Brasstown complex, 30 to 50 percent slopes

Setting

Landscape: Low and intermediate mountains and intermountain hills, dominantly in the central and northern parts of the county
Elevation range: 1,230 to 3,760 feet
Landform: Mountain slopes

Landform position: Side slopes
Shape of areas: Irregular
Size of areas: Up to 290 acres

Map Unit Composition

Junaluska soil and similar inclusions: 50 percent
Brasstown soil and similar inclusions: 40 percent
Dissimilar inclusions: 10 percent

Typical Profile

Junaluska

Surface layer:
0 to 2 inches—moderately decomposed plant material
2 to 4 inches—brown fine sandy loam
4 to 11 inches—strong brown fine sandy loam

Subsoil:
11 to 21 inches—yellowish red sandy clay loam

Underlying material:
21 to 26 inches—yellowish red and red fine sandy loam saprolite

Bedrock:
26 to 80 inches—weathered metasandstone

Brasstown

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 6 inches—dark brown channery fine sandy loam

Subsoil:
6 to 10 inches—yellowish red channery clay loam
10 to 29 inches—red channery sandy clay loam
29 to 37 inches—red channery fine sandy loam

Underlying material:
37 to 46 inches—channery very fine sandy loam saprolite multicolored in shades of red and brown

Bedrock:
46 to 80 inches—weathered, interbedded metasandstone and phyllite

Soil Properties and Qualities

Depth class: Junaluska—moderately deep; Brasstown—deep
Drainage class: Well drained
General texture class: Loamy
Permeability: Moderate
Available water capacity: Junaluska—low; Brasstown—moderate
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Steep
Soil slippage potential: Low
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Organic matter content of surface layer: Low to high

Potential for frost action: Moderate
Soil reaction: Extremely acid to moderately acid throughout the profile
Parent material: Residuum affected by soil creep in the upper part, weathered from low-grade metasedimentary rock
Depth to bedrock: Junaluska—20 to 40 inches; Brasstown—40 to 60 inches to soft bedrock
Other distinctive properties: Potential for downslope movement when lateral support is removed

Minor Components

Dissimilar inclusions:
- Random areas of Soco and Stecoah soils that have less clay in the subsoil and have soft bedrock at a depth of 20 to 60 inches
- Lonon soils that have thick surface layers with more organic matter and have bedrock at a depth of more than 60 inches, in saddles and gaps and in concave areas at the head of drains
- Random areas of Tsali soils that have soft bedrock at a depth of 10 to more than 20 inches
- Snowbird soils that have thicker surface layers with more organic matter, on north- to east-facing side slopes
- Random areas of soils that have more mica in the subsoil and have bedrock at a depth of 20 to more than 60 inches
- Random areas of severely eroded soils where underlying material is exposed at the surface
- Random areas of soils on slopes of less than 30 percent or more than 50 percent

Similar inclusions:
- Junaluska and Brasstown soils that have surface layers of sandy loam or loam

Land Use

Dominant Uses: Woodland and wildlife habitat
Other Uses: Pasture, hayland, building site development, and recreation

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, and depth to bedrock. A site should be selected on better suited soils.

Pasture and hayland
Suitability: Pasture—poorly suited; hayland—unsuited
Management concerns: Junaluska—equipment use, erodibility, soil fertility, rooting depth, and droughtiness; Brasstown—equipment use, erodibility, soil fertility, and rooting depth
Management measures and considerations:
- Because of the slope, this map unit is difficult to manage for pasture and hayland.
- Growing adapted plants helps to ensure the production of high-quality forage and minimize soil erosion.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using rotational grazing and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.

- Because of the low available water capacity due to the moderately deep rooting depth, the Junaluska soil is difficult to manage for the production of pasture and hay crops.

Orchard and ornamental crops

Suitability: Poorly suited

Management concerns: Junaluska—equipment use, erodibility, soil fertility, ball and burlap harvesting, plant shape, rooting depth, and droughtiness; Brasstown—equipment use, erodibility, soil fertility, ball and burlap harvesting, plant shape, and rooting depth

Management measures and considerations:

- These soils may be difficult to manage for orchard or ornamental crops because the slope limits equipment use.
- Establishing and maintaining sod between rows and on access roads helps to reduce the hazard of erosion.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximize productivity.
- Avoiding ball and burlap harvesting during dry periods helps to prevent fracture of the ball and separation of the soil from the roots caused by a low moisture content and a minimal clay content.
- The slope affects the shape of ornamentals on the uphill side.
- Because of the restricted movement of air and water due to the clay content of the subsoil, phytophthora root disease is a potential limitation for Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of the low available water capacity and windthrow hazard due to the moderately deep rooting depth, the Junaluska soil is difficult to manage for orchard and ornamental crops.

Woodland Management and Productivity

Potential for commercial species: Low or moderate for upland hardwoods and high for eastern white pine (fig. 15)

Suitability: Suited

Management concerns: Junaluska—equipment use, erodibility, rooting depth, and windthrow hazard; Brasstown—equipment use, erodibility, and rooting depth

Management measures and considerations:

- Using cable logging methods helps to minimize road and trail construction, especially in areas where slope exceeds 40 percent.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.
- Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
- When the soil is wet, skid trails and unsurfaced roads are highly erodible and very slick due to the silt and clay content in the subsoil.
- Avoiding logging operations during periods when the soil is saturated helps to prevent rutting of the soil surface and damage to tree roots due to soil compaction.
- Livestock should not be allowed to graze in areas managed for woodland.
- Productivity is limited in areas of the Junaluska soil because of the limited rooting depth.

Figure 15.—Eastern white pine in an area of Junaluska-Brasstown complex, 30 to 50 percent slopes. This map unit has a high potential for commercial woodland.

Urban Development

Dwellings

Suitability: Poorly suited
Management concerns: Slope, erodibility, corrosivity, and depth to bedrock
Management measures and considerations:
- Designing structures on the contour with the natural slope or building in less sloping areas helps to improve soil performance.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
- Using corrosion-resistant materials helps to reduce the risk of damage to uncoated steel and concrete.
- The soft bedrock in these soils should not be difficult to excavate but will be difficult to vegetate and pack into a fill slope.

Septic tank absorption fields

Suitability: Poorly suited
Management concerns: Slope and depth to bedrock
Management measures and considerations:
- Contact the local Health Department for guidance on sanitary facilities.
- Installing distribution lines on the contour helps to improve the performance of septic tank absorption fields.
- Locating and using areas of the deeper Brasstown soil may improve the performance of filter fields.
- Raking trench walls helps to prevent the sealing of soil pores which may occur during the excavation of septic tank absorption fields.

Local roads and streets

Suitability: Poorly suited

Management concerns: Slope, low strength, erodibility, depth to bedrock, and frost action

Management measures and considerations:

- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
- Incorporating sand and gravel into the soil, compacting roadbeds, and designing roads that conform to natural slopes help to improve soil strength.
- The soft bedrock in these soils should not be difficult to excavate but will be difficult to vegetate and pack into a fill slope.
- The permanent surfacing of roads or the use of suitable subgrade or base material allows the year-round use of roads and helps to reduce the damage from frost heaving.

Lawns and landscaping

Suitability: Poorly suited

Management concerns: Junaluska—slope, erodibility, soil fertility, depth to bedrock, and droughtiness; Brasstown—slope, erodibility, soil fertility, and depth to bedrock

Management measures and considerations:

- Designing plantings on natural contours helps to increase water infiltration.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Avoiding the use of heavy equipment in areas to be landscaped helps to prevent soil compaction.
- Topsoil should be stockpiled from disturbed areas and replaced before landscaping.
- Using lime, fertilizer, mulch, and irrigation helps to establish lawns and landscape plants.
- Because of the restricted movement of air and water due to the clay content of the subsoil, phytophthora root disease is a potential limitation for Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of the moderately deep rooting depth, the Junaluska soil is difficult to manage for lawns and landscaping, especially if the soil has been disturbed.
- If excavated material is to be used for landscaping, any soft bedrock will need to be crushed or removed.

Interpretive Groups

Land capability classification: 6e

JnD—Junaluska-Brasstown-Urban land complex, 8 to 50 percent slopes

Setting

Landscape: Low and intermediate mountains and intermountain hills, dominantly near Robbinsville in the central part of the county

Elevation range: 1,700 to 2,570 feet

Landform: Mountain slopes
Landform position: Side slopes
Shape of areas: Irregular
Size of areas: Up to 42 acres

Map Unit Composition

Junaluska soil and similar inclusions: 40 percent
Brasstown soil and similar inclusions: 30 percent
Urban land: 25 percent
Dissimilar inclusions: 5 percent

Typical Profile

Junaluska

Surface layer:
0 to 2 inches—moderately decomposed plant material
2 to 4 inches—brown fine sandy loam
4 to 11 inches—strong brown fine sandy loam

Subsoil:
11 to 21 inches—yellowish red sandy clay loam

Underlying material:
21 to 26 inches—yellowish red and red fine sandy loam saprolite

Bedrock:
26 to 80 inches—weathered metasandstone

Brasstown

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 6 inches—dark brown channery fine sandy loam

Subsoil:
6 to 10 inches—yellowish red channery clay loam
10 to 29 inches—red channery sandy clay loam
29 to 37 inches—red channery fine sandy loam

Underlying material:
37 to 46 inches— channery very fine sandy loam saprolite multicolored in shades of red and brown

Bedrock:
46 to 80 inches—weathered, interbedded metasandstone and phyllite

Urban land

Urban land consists of areas where 85 percent of the surface is covered with buildings, streets, parking lots, and other impervious material. The natural soils are paved over, covered, or greatly altered by cutting, filling, or grading during the process of urban development. The original landscape, topography, and, commonly, the drainage pattern have been changed. Runoff is very rapid and increases the hazard of flooding in low-lying areas. A typical profile is not given due to the variable nature of the soil. An onsite investigation is needed to determine the suitability and limitations of any area within this map unit.

Properties and Qualities of the Junaluska and Brasstown Soils

Depth class: Junaluska—moderately deep; Brasstown—deep
Drainage class: Well drained

General texture class: Loamy
Permeability: Moderate
Available water capacity: Junaluska—low; Brasstown—moderate
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Strongly sloping to steep
Soil slippage potential: Low
Extent of erosion: Slight to severe
Hazard of water erosion: Severe or very severe
Organic matter content of surface layer: Low to high
Potential for frost action: Moderate
Soil reaction: Extremely acid to moderately acid throughout the profile
Parent material: Residuum affected by soil creep in the upper part, weathered from low-grade metasedimentary rock
Depth to bedrock: Junaluska—20 to 40 inches; Brasstown—40 to 60 inches to soft bedrock
Other distinctive properties: Potential for downslope movement when lateral support is removed; differential settling

Minor Components

Dissimilar inclusions:
- Random areas of Udorthents, loamy
- Random areas of severely eroded soils where underlying material is exposed at the surface
- Random areas of soils on short, steep to nearly vertical slopes
- Random areas of Soco and Stecoah soils that have less clay in the subsoil and have soft bedrock at a depth of 20 to 60 inches
- Random areas of Tsali soils that have soft bedrock at a depth of 10 to 20 inches
- Thurmont soils that have a water table at a depth of 40 to 60 inches, in depressions, on toeslopes, and in drainageways
- Random areas of soils that have more mica in the subsoil and have bedrock at a depth of 20 to more than 60 inches
- Random areas of soils on slopes of less than 8 percent or more than 50 percent

Similar inclusions:
- Junaluska and Brasstown soils that have surface layers of sandy loam or loam
- Random areas of similar soils that have brown subsoils

Land Use

Dominant Uses: Building site development

Agricultural Development

Cropland
This map unit is not managed for cropland.

Pasture and hayland
This map unit is not managed for pasture and hayland.

Orchard and ornamental crops
This map unit is not managed for orchard or ornamental crops.

Woodland Management and Productivity

This map unit is not managed for timber production.

Urban Development

Dwellings

Suitability: Poorly suited
Management concerns: Slope, erodibility, corrosivity, and depth to bedrock
Management measures and considerations:
- Designing structures on the contour with the natural slope or building in less sloping areas helps to improve soil performance.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Because of the droughty nature of the Junaluska and Brasstown soils, revegetating cut and fill slopes can be difficult.
- Using corrosion-resistant materials helps to reduce the risk of damage to uncoated steel and concrete.
- The soils are slippery and slightly sticky when wet and slow to dry.
- The soft bedrock in these soils should not be difficult to excavate but will be difficult to vegetate and pack into a fill slope.

Septic tank absorption fields

Suitability: Poorly suited
Management concerns: Slope and depth to bedrock
Management measures and considerations:
- Contact the local Health Department for guidance on sanitary facilities.
- Installing distribution lines on the contour helps to improve the performance of septic tank absorption fields.
- Raking trench walls helps to prevent the sealing of soil pores which may occur during the excavation of septic tank absorption fields.
- Locating and using areas of the deeper Brasstown soil may improve the performance of filter fields.

Local roads and streets

Suitability: Poorly suited
Management concerns: Slope, low strength, erodibility, depth to bedrock, and frost action
Management measures and considerations:
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Because of the droughty nature of the Junaluska and Brasstown soils, revegetating cut and fill slopes can be difficult.
- Incorporating sand and gravel into the soil, compacting roadbeds, and designing roads that conform to natural slopes help to improve soil strength.
- The soft bedrock in these soils should not be difficult to excavate but will be difficult to vegetate and pack into a fill slope.
- The permanent surfacing of roads or the use of suitable subgrade or base material allows the year-round use of roads and helps to reduce the damage from frost heaving.

Lawns and landscaping

Suitability: Poorly suited
Management concerns: Junaluska—slope, erodibility, soil fertility, depth to bedrock, and droughtiness; Brasstown—slope, erodibility, soil fertility, and depth to bedrock

Management measures and considerations:
- Designing plantings on natural contours helps to increase water infiltration.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Avoiding the use of heavy equipment in areas to be landscaped helps to prevent soil compaction.
- Topsoil should be stockpiled from disturbed areas and replaced before landscaping.
- Using lime, fertilizer, mulch, and irrigation helps to establish lawns and landscape plants.
- Because of the restricted movement of air and water due to the clay content of the subsoil, phytophthora root disease is a potential limitation for Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of the moderately deep rooting depth, the Junaluska soil is difficult to manage for lawns and landscaping, especially if the soil has been disturbed.
- If excavated material is to be used for landscaping, any soft bedrock will need to be crushed or removed.

Interpretive Groups

Land capability classification: Junaluska and Brasstown—6e; Urban land—8s

JtD—Junaluska-Tsali complex, 15 to 30 percent slopes

Setting

Landscape: Intermountain hills and low and intermediate mountains, dominantly in the eastern part of the county
Elevation range: 1,300 to 3,980 feet
Landform: Ridges and mountain slopes
Landform position: Summits and side slopes
Shape of areas: Long and narrow on summits and irregular on side slopes
Size of areas: Up to 205 acres

Map Unit Composition

Junaluska soil and similar inclusions: 65 percent
Tsali soil and similar inclusions: 25 percent
Dissimilar inclusions: 10 percent

Typical Profile

Junaluska

Surface layer:
0 to 2 inches—moderately decomposed plant material
2 to 4 inches—brown fine sandy loam
4 to 11 inches—strong brown fine sandy loam

Subsoil:
11 to 21 inches—yellowish red sandy clay loam

Underlying material:
21 to 26 inches—yellowish red and red fine sandy loam saprolite

Bedrock:
26 to 80 inches—weathered metasandstone

Tsali

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 8 inches—yellowish brown channery loam

Subsoil:
8 to 13 inches—yellowish red channery loam
13 to 18 inches—yellowish red channery clay loam

Bedrock:
18 to 80 inches—weathered metasandstone

Soil Properties and Qualities

Depth class: Junaluska—moderately deep; Tsali—shallow
Drainage class: Well drained
General texture class: Loamy
Permeability: Moderate
Available water capacity: Junaluska—low; Tsali—very low
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Moderately steep
Soil slippage potential: None
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Organic matter content of surface layer: Low to high
Potential for frost action: Moderate
Soil reaction: Extremely acid to moderately acid throughout the profile
Parent material: Residuum weathered from low-grade metasedimentary rock
Depth to bedrock: Junaluska—20 to 40 inches to soft bedrock; Tsali—10 to 20 inches to fractured, thinly bedded bedrock

Minor Components

Dissimilar inclusions:
- Random areas of Brasstown soils that have soft bedrock at a depth of 40 to 60 inches
- Random areas of soils that have more mica in the subsoil and have bedrock at a depth of 20 to more than 60 inches
- Random areas of Soco and Stecoah soils that have less clay in the subsoil and have soft bedrock at a depth of 20 to 60 inches
- Lonon soils that have thick surface layers with more organic matter and have bedrock at a depth of more than 60 inches, in saddles and gaps and in concave areas at the head of drains
- Random areas of severely eroded soils where underlying material is exposed at the surface
- Cataska and Sylco soils that have less clay and more rock fragments in the subsoil and have bedrock at a depth of 10 to 40 inches, on shoulder slopes and adjacent to widely scattered areas of rock outcrop
- Widely scattered areas of rock outcrop, on narrow ridges
- Random areas of soils on slopes of less than 15 percent or more than 30 percent

Similar inclusions:
• Junaluska soils that have surface layers of sandy loam or loam
• Tsali soils that have surface layers of sandy loam or fine sandy loam

Land Use

Dominant Uses: Woodland
Other Uses: Building site development, pasture, and hayland

Agricultural Development

Cropland

Suitability: Junaluska—poorly suited; Tsali—unsuited
Management concerns: Equipment use, erodibility, tilth, soil fertility, rooting depth, and droughtiness
Management measures and considerations:
• The Tsali soil is severely limited for cropland because of the depth to bedrock.
• An onsite investigation is needed to determine the suitability and limitations of any area within this map unit.

Pasture and hayland

Suitability: Junaluska—suited; Tsali—poorly suited
Management concerns: Equipment use, erodibility, soil fertility, rooting depth, and droughtiness
Management measures and considerations:
• The slope limits the use of equipment in the steeper areas.
• Growing adapted plants helps to ensure the production of high-quality forage and minimize soil erosion.
• Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
• Using rotational grazing, implementing a well planned harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.
• Because of the low and very low available water capacities due to the moderately deep and shallow rooting depths, these soils are difficult to manage for the production of pasture and hay crops.

Orchard and ornamental crops

Suitability: Junaluska—poorly suited; Tsali—unsuited
Management concerns: Equipment use, erodibility, soil fertility, ball and burlap harvesting, plant shape, rooting depth, and droughtiness
Management measures and considerations:
• An onsite investigation is needed to determine the suitability and limitations of any area within this map unit.
• Because of the low and very low available water capacities and windthrow hazard due to the moderately deep and shallow rooting depths, these soils are difficult to manage for orchard and ornamental crops.
• These soils may be difficult to manage for orchard or ornamental crops because the slope limits equipment use.
• Establishing and maintaining sod between rows and on access roads helps to reduce the hazard of erosion.
• Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximize productivity.
• The slope affects the shape of ornamentals on the uphill side.

- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.

Woodland Management and Productivity

Potential for commercial species: Low or moderate for upland hardwoods and eastern white pine
Suitability: Junaluska—suited; Tsali—unsuited
Management concerns: Equipment use, erodibility, rooting depth, and windthrow hazard
Management measures and considerations:
- Productivity is limited by the limited rooting depth.
- Using improved varieties of eastern white pine helps to increase productivity.
- Replanting may be necessary on warm, south- to west-facing slopes because of the reduced amount of soil moisture. Planting when the soil is moist for extended periods helps to increase seedling survival rates.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- The soft bedrock in these soils should not be difficult to excavate but will be difficult to vegetate and pack into a fill slope.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.
- Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
- When the soil is wet, skid trails and unsurfaced roads are highly erodible and very slick due to the silt and clay content of the subsoil.
- Avoiding logging operations during periods when the soil is saturated helps to prevent rutting of the soil surface and damage to tree roots due to soil compaction.
- Leaving a buffer zone of trees and shrubs adjacent to streams helps to minimize siltation and provides shade for the aquatic habitat.
- Livestock should not be allowed to graze in areas managed for woodland.

Urban Development

Dwellings

Suitability: Junaluska—poorly suited; Tsali—unsuited
Management concerns: Slope, erodibility, corrosivity, and depth to bedrock
Management measures and considerations:
- An onsite investigation is needed to determine the suitability and limitations of any area within this map unit.
- Designing structures on the contour with the natural slope or building in less sloping areas helps to improve soil performance.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
- Using corrosion-resistant materials helps to reduce the risk of damage to uncoated steel and concrete.
- The soils are slippery and sticky when wet.
- The soft bedrock in these soils should not be difficult to excavate but will be difficult to vegetate and pack into a fill slope.

Figure 16.—A septic system being installed in an area of Junaluska-Tsali complex, 15 to 30 percent slopes. Onsite investigation is required to locate areas with the best soil conditions for a septic filter field.

Septic tank absorption fields
Suitability: Junaluska—poorly suited; Tsali—unsuited (fig. 16)
Management concerns: Slope and depth to bedrock
Management measures and considerations:
- An onsite investigation is needed to determine the suitability and limitations of any area within this map unit.
- Contact the local Health Department for guidance on sanitary facilities.

Local roads and streets
Suitability: Junaluska—suited; Tsali—poorly suited
Management concerns: Slope, low strength, erodibility, depth to bedrock, and frost action
Management measures and considerations:
- An onsite investigation is needed to determine the suitability and limitations of any area within this map unit.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
- Incorporating sand and gravel into the soil, compacting roadbeds, and designing roads that conform to natural slopes help to improve soil strength.
- The soft bedrock in these soils should not be difficult to excavate but will be difficult to vegetate and pack into a fill slope.
- The permanent surfacing of roads or the use of suitable subgrade or base material allows the year-round use of roads and helps to reduce the damage from frost heaving.

Lawns and landscaping

Suitability: Junaluska—suited; Tsali—poorly suited

Management concerns: Junaluska—slope, erodibility, soil fertility, depth to bedrock, and droughtiness; Tsali—slope, erodibility, soil fertility, and depth to bedrock

Management measures and considerations:

- An onsite investigation is needed to determine the suitability and limitations of any area within this map unit.
- Designing plantings on natural contours helps to increase water infiltration.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Avoiding the use of heavy equipment in areas to be landscaped helps to prevent soil compaction.
- Topsoil should be stockpiled from disturbed areas and replaced before landscaping.
- The soils are slippery and sticky when wet.
- Using lime, fertilizer, mulch, and irrigation helps to establish lawns and landscape plants.
- In areas where water concentrates, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of the moderately deep and shallow rooting depths, these soils are difficult to manage for lawns and landscaping, especially if the soil has been disturbed.
- If excavated material is to be used for landscaping, any soft bedrock will need to be crushed or removed.

Interpretive Groups

Land capability classification: Junaluska—4e; Tsali—6s

JtE—Junaluska-Tsali complex, 30 to 50 percent slopes

Setting

Landscape: Intermountain hills and low and intermediate mountains, dominantly in the eastern part of the county

Elevation range: 1,380 to 3,950 feet

Landform: Mountain slopes

Landform position: Side slopes

Shape of areas: Irregular

Size of areas: Up to 178 acres

Map Unit Composition

Junaluska soil and similar inclusions: 65 percent

Tsali soil and similar inclusions: 25 percent

Dissimilar inclusions: 10 percent

Typical Profile

Junaluska

Surface layer:

0 to 2 inches—moderately decomposed plant material

2 to 4 inches—brown fine sandy loam

4 to 11 inches—strong brown fine sandy loam

Subsoil:

11 to 21 inches—yellowish red sandy clay loam

Underlying material:
21 to 26 inches—yellowish red and red fine sandy loam saprolite

Bedrock:
26 to 80 inches—weathered metasandstone

Tsali

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 8 inches—yellowish brown channery loam

Subsoil:
8 to 13 inches—yellowish red channery loam
13 to 18 inches—yellowish red channery clay loam

Bedrock:
18 to 80 inches—weathered metasandstone

Soil Properties and Qualities

Depth class: Junaluska—moderately deep; Tsali—shallow
Drainage class: Well drained
General texture class: Loamy
Permeability: Moderate
Available water capacity: Junaluska—low; Tsali—very low
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Steep
Soil slippage potential: Low
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Organic matter content of surface layer: Low to high
Potential for frost action: Moderate
Soil reaction: Extremely acid to moderately acid throughout the profile
Parent material: Residuum affected by soil creep in the upper part, weathered from low-grade metasedimentary rock
Depth to bedrock: Junaluska—20 to 40 inches to soft bedrock; Tsali—10 to 20 inches to fractured, thinly bedded bedrock
Other distinctive properties: Potential for downslope movement when lateral support is removed

Minor Components

Dissimilar inclusions:
- Random areas of Brasstown soils that have soft bedrock at a depth of 40 to 60 inches
- Random areas of soils that have more mica in the subsoil and have bedrock at a depth of 20 to more than 60 inches
- Snowbird soils that have thicker surface layers with more organic matter and have bedrock at a depth of 40 to 60 inches, on north- to east-facing side slopes
- Random areas of Soco and Stecoah soils that have less clay in the subsoil and have soft bedrock at a depth of 20 to 60 inches
- Lonon soils that have thick surface layers with more organic matter and have bedrock at a depth of more than 60 inches, in drainageways and concave areas at the head of drains

- Northcove soils that have thick surface layers with more organic matter, have more rock fragments in the subsoil, and have bedrock at a depth of more than 60 inches; in drainageways and below rock outcrops
- Cataska and Sylco soils that have less clay and more rock fragments in the subsoil and have bedrock at 10 to 40 inches, on shoulder slopes and adjacent to widely scattered areas of rock outcrop
- Widely scattered areas of rock outcrop, on narrow ridges
- Random areas of soils on slopes of less than 30 percent or more than 50 percent

Similar inclusions:
- Junaluska soils that have surface layers of sandy loam or loam
- Tsali soils that have surface layers of sandy loam or fine sandy loam

Land Use

Dominant Uses: Woodland and wildlife habitat
Other Uses: Pasture and building site development

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, and depth to bedrock. A site should be selected on better suited soils.

Pasture and hayland
Suitability: Pasture—poorly suited; hayland—unsuited
Management concerns: Junaluska—equipment use, erodibility, soil fertility, rooting depth, and droughtiness; Tsali—equipment use, erodibility, soil fertility, and rooting depth
Management measures and considerations:
- Because of the slope, this map unit is difficult to manage for pasture and hayland.
- Growing adapted plants helps to ensure the production of high-quality forage and minimize soil erosion.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using rotational grazing and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.
- Because of the low and very low available water capacities due to the moderately deep and shallow rooting depths, these soils are difficult to manage for pasture.

Orchard and ornamental crops
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for orchard and ornamental crops because of the slope, erodibility, and depth to bedrock. A site should be selected on better suited soils.

Woodland Management and Productivity

Potential for commercial species: Low or moderate for upland hardwoods and eastern white pine
Suitability: Junaluska—suited; Tsali—unsuited
Management concerns: Equipment use, erodibility, rooting depth, and windthrow hazard (fig. 17)

Figure 17.—A windthrown tree in an area of Junaluska-Tsali complex, 30 to 50 percent slopes. Windthrow is a management concern in this map unit because of the depth to bedrock.

Management measures and considerations:
- Productivity is limited by the limited rooting depth.
- Using cable logging methods helps to minimize road and trail construction, especially in areas where slope exceeds 40 percent.
- The underlying bedrock may be susceptible to mass movement.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.
- Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
- Leaving a buffer zone of trees and shrubs adjacent to streams helps to minimize siltation and provides shade for the aquatic habitat.
- When the soil is wet, skid trails and unsurfaced roads are highly erodible and very slick due to the silt and clay content in the subsoil.
- Avoiding logging operations during periods when the soil is saturated helps to prevent rutting of the soil surface and damage to tree roots due to soil compaction.
- Livestock should not be allowed to graze in areas managed for woodland.

Urban Development

Dwellings
Suitability: Poorly suited
Management concerns: Slope, erodibility, corrosivity, and depth to bedrock

Management measures and considerations:
- An onsite investigation is needed to determine the suitability and limitations of any area within this map unit.
- The underlying bedrock may be susceptible to mass movement.
- Designing structures on the contour with the natural slope or building in less sloping areas helps to improve soil performance.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
- Using corrosion-resistant materials helps to reduce the risk of damage to uncoated steel and concrete.
- The soils are slippery and sticky when wet.
- The soft bedrock in these soils should not be difficult to excavate but will be difficult to vegetate and pack into a fill slope.

Septic tank absorption fields
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for septic tank absorption fields because of the slope and depth to bedrock. Contact the local Health Department for additional guidance. A site should be selected on better suited soils.

Local roads and streets
Suitability: Poorly suited
Management concerns: Slope, low strength, erodibility, depth to bedrock, and frost action
Management measures and considerations:
- An onsite investigation is needed to determine the suitability and limitations of any area within this map unit.
- The underlying bedrock may be susceptible to mass movement.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
- Incorporating sand and gravel into the soil, compacting roadbeds, and designing roads that conform to natural slopes help to improve soil strength.
- The soft bedrock in these soils should not be difficult to excavate but will be difficult to vegetate and pack into a fill slope.
- The permanent surfacing of roads or the use of suitable subgrade or base material allows the year-round use of roads and helps to reduce the damage from frost heaving.

Lawns and landscaping
Suitability: Poorly suited
Management concerns: Junaluska—slope, erodibility, soil fertility, depth to bedrock, and droughtiness; Tsali—slope, erodibility, soil fertility, and depth to bedrock
Management measures and considerations:
- An onsite investigation is needed to determine the suitability and limitations of any area within this map unit.
- Designing plantings on natural contours helps to increase water infiltration.

- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Avoiding the use of heavy equipment in areas to be landscaped helps to prevent soil compaction.
- Topsoil should be stockpiled from disturbed areas and replaced before landscaping.
- The soils are slippery and sticky when wet.
- Using lime, fertilizer, mulch, and irrigation helps to establish lawns and landscape plants.
- In areas where water concentrates, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of the moderately deep and shallow rooting depths, these soils are difficult to manage for lawns and landscaping, especially if the soil has been disturbed.
- If excavated material is to be used for landscaping, any soft bedrock will need to be crushed or removed.

Interpretive Groups

Land capability classification: Junaluska—6e; Tsali—6s

JtF—Junaluska-Tsali complex, 50 to 95 percent slopes

Setting

Landscape: Intermountain hills and low and intermediate mountains, dominantly in the eastern part of the county
Elevation range: 1,280 to 3,670 feet
Landform: Mountain slopes
Landform position: Side slopes
Shape of areas: Irregular
Size of areas: Up to 246 acres

Map Unit Composition

Junaluska soil and similar inclusions: 65 percent
Tsali soil and similar inclusions: 25 percent
Dissimilar inclusions: 10 percent

Typical Profile

Junaluska

Surface layer:
0 to 2 inches—moderately decomposed plant material
2 to 4 inches—brown fine sandy loam
4 to 11 inches—strong brown fine sandy loam

Subsoil:
11 to 21 inches—yellowish red sandy clay loam

Underlying material:
21 to 26 inches—yellowish red and red fine sandy loam saprolite

Bedrock:
26 to 80 inches—weathered metasandstone

Tsali

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 8 inches—yellowish brown channery loam

Subsoil:
8 to 13 inches—yellowish red channery loam
13 to 18 inches—yellowish red channery clay loam

Bedrock:
18 to 80 inches—weathered metasandstone

Soil Properties and Qualities

Depth class: Junaluska—moderately deep; Tsali—shallow
Drainage class: Well drained
General texture class: Loamy
Permeability: Moderate
Available water capacity: Junaluska—low; Tsali—very low
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Very steep
Soil slippage potential: Low
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Organic matter content of surface layer: Low to high
Potential for frost action: Moderate
Soil reaction: Extremely acid to moderately acid throughout the profile
Parent material: Residuum affected by soil creep in the upper part, weathered from low-grade metasedimentary rock
Depth to bedrock: Junaluska—20 to 40 inches to soft bedrock; Tsali—10 to 20 inches to fractured, thinly bedded bedrock
Other distinctive properties: Potential for downslope movement when lateral support is removed

Minor Components

Dissimilar inclusions:
- Random areas of Soco and Stecoah soils that have less clay in the subsoil and have soft bedrock at a depth of 20 to 60 inches
- Snowbird soils that have thicker surface layers with more organic matter and have bedrock at a depth of 40 to 60 inches, on north- to east-facing side slopes
- Santeetlah soils that have thicker surface layers with more organic matter and have bedrock at a depth of more than 60 inches, on toeslopes, on benches, and in concave areas at the heads of drains
- Spivey soils that have thicker surface layers with more organic matter, have more rock fragments in the subsoil, and have bedrock at a depth of more than 60 inches; in drainageways and below rock outcrops
- Random areas of Brasstown soils that have soft bedrock at a depth of 40 to 60 inches
- Random areas of soils that have more mica in the subsoil and have bedrock at a depth of 20 to more than 60 inches
- Cataska and Sylco soils that have less clay and more rock fragments in the subsoil and have bedrock at a depth of 10 to 40 inches, on shoulder slopes and adjacent to widely scattered areas of rock outcrop

- Widely scattered areas of rock outcrop
- Random areas of soils on slopes of less than 50 percent or more than 95 percent

Similar inclusions:
- Junaluska soils that have surface layers of sandy loam or loam
- Tsali soils that have surface layers of sandy loam or fine sandy loam

Land Use

Dominant Uses: Woodland and wildlife habitat

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, and depth to bedrock. A site should be selected on better suited soils.

Pasture and hayland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for the production of pasture and hay crops because of the slope, erodibility, and depth to bedrock. A site should be selected on better suited soils.

Orchard and ornamental crops
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for orchard and ornamental crops because of the slope, erodibility, and depth to bedrock. A site should be selected on better suited soils.

Woodland Management and Productivity

Potential for commercial species: Low for upland hardwoods and low or moderate for eastern white pine
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for timber production because of the slope, erodibility, low productivity, low volume, and depth to bedrock. A site should be selected on better suited soils.

Urban Development

Dwellings
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for dwellings because of the slope, erodibility, and depth to bedrock. A site should be selected on better suited soils.

Septic tank absorption fields
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for dwellings because of the slope, erodibility, and depth to bedrock. A site should be selected on better suited soils.

Local roads and streets
Suitability: Unsuited

Management concerns:
- This map unit is severely limited for dwellings because of the slope, erodibility, and depth to bedrock. A site should be selected on better suited soils.

Lawns and landscaping
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for dwellings because of the slope, erodibility, and depth to bedrock. A site should be selected on better suited soils.

Interpretive Groups

Land capability classification: Junaluska—7e; Tsali—7s

LnC—Lonon-Northcove complex, 8 to 15 percent slopes, bouldery

Setting

Landscape: Intermountain hills and low and intermediate mountains, dominantly in the central and eastern parts of the county
Elevation range: 1,480 to 3,020 feet
Landform: Coves, colluvial fans, drainageways, and benches
Landform position: Footslopes and toeslopes
Shape of areas: Long and narrow or irregular
Size of areas: Up to 107 acres

Map Unit Composition

Lonon soil and similar inclusions: 65 percent
Northcove soil and similar inclusions: 20 percent
Dissimilar inclusions: 15 percent

Typical Profile

Lonon

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 8 inches—dark yellowish brown channery loam

Subsoil:
8 to 40 inches—strong brown channery clay loam
40 to 80 inches—strong brown channery loam

Northcove

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 8 inches—dark yellowish brown very channery loam

Subsoil:
8 to 30 inches—strong brown very channery loam
30 to 80 inches—strong brown extremely channery loam

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
General texture class: Lonon—loamy; Northcove—loamy with many rock fragments
Permeability: Lonon—moderately rapid in the surface horizon and underlying material and moderate in the subsoil; Northcove—moderately rapid

Available water capacity: Lonon—moderate; Northcove—low or moderate
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Strongly sloping
Soil slippage potential: None
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Severe
Rock fragments on the surface: Widely scattered stones and boulders that average about 15 to 48 inches in length and are about 25 to 75 feet apart
Organic matter content of surface layer: Moderate or high
Potential for frost action: Lonon—moderate; Northcove—low
Special climatic conditions: Soils subject to slow air drainage, which allows late spring and early fall frosts
Soil reaction: Lonon—very strongly acid or strongly acid throughout, except where surface layers have been limed; Northcove—extremely acid to moderately acid throughout
Parent material: Colluvium derived from low-grade metasedimentary rock
Depth to bedrock: More than 60 inches
Other distinctive properties: Random areas of seeps and springs; soils subject to overland flow of storm water from adjacent uplands; a high content of rock fragments in the Northcove soil

Minor Components

Dissimilar inclusions:
- Areas of soils where the surface fragments have been removed
- Soils that have a seasonal high water table at a depth of less than 6.0 feet, in depressions, on toeslopes, and along stream channels
- Soils that are somewhat poorly drained or poorly drained, in areas of seeps and springs
- Areas that are occasionally flooded for very brief periods, along stream channels
- Soils that have bedrock at a depth of less than 6.0 feet, in drainageways and on the outer edge of map unit delineations
- Random areas of soils on slopes of less than 8 percent or more than 15 percent

Similar inclusions:
- Lonon and Northcove soils that have surface layers of fine sandy loam or sandy loam

Land Use

Dominant Uses: Pasture, hayland, cropland, and ornamental crops
Other Uses: Building site development, recreation, woodland, and wildlife habitat

Agricultural Development

Cropland
Suitability: Lonon—suited; Northcove—unsuited
Management concerns: Equipment use, erodibility, soil fertility, and climate
Management measures and considerations:
- This map unit is severely limited for crop production because of the bouldery surface and the high content of rock fragments in the Northcove soil. An onsite investigation is needed to determine the suitability and limitations of any area within this map unit for cropland.
- The slope may limit equipment use in the steeper areas.

- Using conservation practices, such as contour farming, winter cover crops, and crop rotations which include grasses and legumes, helps to minimize soil erosion, maximize the infiltration of rainfall, increase the available water capacity, and improve soil fertility.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes crop productivity.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.

Pasture and hayland
Suitability: Suited
Management concerns: Erodibility, equipment use, pesticide retention, and soil fertility
Management measures and considerations:
- Growing adapted plants helps to ensure the production of high-quality forage and minimize soil erosion.
- The slope and surface stones and boulders limit the use of equipment and may be hazardous.
- Fencing livestock away from creeks and streams helps to prevent streambank erosion and sedimentation.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using rotational grazing, implementing a well planned harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.

Orchard and ornamental crops
Suitability: Lonon—suited; Northcove—unsuited
Management concerns: Lonon—equipment use, erodibility, climate, pesticide retention, and soil fertility; Northcove—equipment use, erodibility, climate, pesticide retention, soil fertility, and ball and burlap harvesting
Management measures and considerations:
- This map unit is severely limited for orchard and ornamental crops because of the bouldery surface and the high content of rock fragments in the Northcove soil.
- The slope may limit equipment use in the steeper areas.
- Avoiding ball and burlap harvesting during dry periods helps to prevent fracture of the ball and separation of the soil from the roots caused by the low moisture content of the Lonon soil.
- Establishing and maintaining sod between rows and on access roads helps to reduce the hazard of erosion.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximize productivity.

Woodland Management and Productivity

Potential for commercial species: High for cove hardwoods
Suitability: Suited
Management concerns: Equipment use and erodibility
Management measures and considerations:
- Using cable logging methods helps to overcome limited road and trail construction caused by the large number of stones and boulders on the soil surface.

- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.
- Avoiding logging operations during periods when the soil is saturated helps to prevent rutting of the soil surface and damage to tree roots due to soil compaction.
- Leaving a buffer zone of trees and shrubs adjacent to streams helps to minimize siltation and provides shade for the aquatic habitat.
- Livestock should not be allowed to graze in areas managed for woodland.

Urban Development

Dwellings

Suitability: Lonon—suited; Northcove—poorly suited
Management concerns: Lonon—large stones, slope, erodibility, seeps and springs, and corrosivity; Northcove—large stones, slope, erodibility, seeps and springs, corrosivity, and unstable excavation walls
Management measures and considerations:
- An onsite investigation is needed to determine the suitability and limitations of any area within this map unit.
- Large stones and boulders will be encountered during excavation.
- Designing structures so that they conform with natural slopes helps to improve soil performance.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Installing a subsurface drainage system around foundations helps to intercept water from seeps and springs.
- Locating structures away from intermittent and perennial drainageways helps to minimize structural damage from overland flow of storm water.
- Using corrosion-resistant materials helps to reduce the risk of damage to concrete.
- Installing permanent retaining walls helps to improve soil stability.

Septic tank absorption fields

Suitability: Lonon—suited; Northcove—unsuited
Management concerns: Lonon—large stones, slope, and seeps and springs; Northcove—large stones, slope, seeps and springs, and poor filtering capacity
Management measures and considerations:
- Contact the local Health Department for guidance on sanitary facilities.
- Large stones and boulders will be encountered during excavation.
- Installing distribution lines on the contour helps to improve the performance of septic tank absorption fields.
- Excavations may cut into seeps and springs. These areas should be avoided.
- Measures that improve the filtering capacity should be considered; the Northcove soil readily absorbs but does not adequately filter effluent.

Local roads and streets

Suitability: Suited
Management concerns: Lonon—large stones, slope, erodibility, seeps and springs, and frost action; Northcove—large stones, slope, erodibility, seeps and springs, and differential settling
Management measures and considerations:
- Large stones and boulders will be encountered during excavation.

- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Intercepting and diverting underground water from seeps and springs helps to stabilize cut and fill slopes.
- The Northcove soil is subject to uneven settling and may be unstable if not properly compacted.
- The permanent surfacing of roads or the use of suitable subgrade or base material allows the year-round use of roads and helps to reduce the damage from frost heaving.

Lawns and landscaping

Suitability: Lonon—suited; Northcove—poorly suited

Management concerns: Large stones, slope, erodibility, climate, pesticide retention, and soil fertility

Management measures and considerations:

- The bouldery surface and the high content of rock fragments in the Northcove soil are limitations affecting lawns and landscaping.
- Designing plantings on natural contours helps to increase water infiltration.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.
- Using lime, fertilizer, mulch, and irrigation helps to establish lawns and landscape plants.
- Topsoil should be stockpiled from disturbed areas and replaced before landscaping.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.

Interpretive Groups

Land capability classification: Lonon—3e; Northcove—6s

LnD—Lonon-Northcove complex, 15 to 30 percent slopes, bouldery

Setting

Landscape: Intermountain hills and low and intermediate mountains, dominantly in the central and eastern parts of the county

Elevation range: 1,090 to 3,730 feet

Landform: Coves, colluvial fans, drainageways, and benches

Landform position: Footslopes and toeslopes

Shape of areas: Long and narrow or irregular

Size of areas: Up to 143 acres

Map Unit Composition

Lonon soil and similar inclusions: 65 percent

Northcove soil and similar inclusions: 20 percent

Dissimilar inclusions: 15 percent

Typical Profile

Lonon

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 8 inches—dark yellowish brown channery loam

Subsoil:
8 to 40 inches—strong brown channery clay loam
40 to 80 inches—strong brown channery loam

Northcove

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 8 inches—dark yellowish brown very channery loam

Subsoil:
8 to 30 inches—strong brown very channery loam
30 to 80 inches—strong brown extremely channery loam

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
General texture class: Lonon—loamy; Northcove—loamy with many rock fragments
Permeability: Lonon—moderately rapid in the surface horizon and underlying material and moderate in the subsoil; Northcove—moderately rapid
Available water capacity: Lonon—moderate; Northcove—low or moderate
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Moderately steep
Soil slippage potential: None
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: Widely scattered stones and boulders that average about 15 to 48 inches in length and are about 25 to 75 feet apart
Organic matter content of surface layer: Moderate or high
Potential for frost action: Lonon—moderate; Northcove—low
Special climatic conditions: Soils subject to slow air drainage, which allows late spring and early fall frosts
Soil reaction: Northcove—extremely acid to moderately acid throughout; Maymead—very strongly acid or strongly acid throughout, except where surface layers have been limed
Parent material: Colluvium derived from low-grade metasedimentary rock
Depth to bedrock: More than 60 inches
Other distinctive properties: Random areas of seeps and springs; soils subject to overland flow of storm water from adjacent uplands; a high content of rock fragments in the Northcove soil

Minor Components

Dissimilar inclusions:
- Areas of rubble land in drainageways
- Soils that have a seasonal high water table at a depth of less than 6.0 feet, in depressions and on toeslopes

- Areas of soils where the surface fragments have been removed
- Areas that are rarely flooded for very brief periods, along stream channels
- Soils that are poorly drained, in areas of seeps and springs
- Soils that have bedrock at a depth of less than 6.0 feet, in drainageways and on the outer edge of map unit delineations
- Random areas of soils on slopes of less than 15 percent or more than 30 percent

Similar inclusions:
- Lonon and Northcover soils that have surface layers of fine sandy loam or sandy loam

Land Use

Dominant Uses: Woodland and wildlife habitat
Other Uses: Pasture, building site development, and recreation

Agricultural Development

Cropland
Suitability: Lonon—poorly suited; Northcove—unsuited
Management concerns: Equipment use, erodibility, soil fertility, pesticide retention, and climate
Management measures and considerations:
- This map unit is severely limited for crop production because of the slope, erodibility, bouldery surface, and the high content of rock fragments in the Northcove soil.
- An onsite investigation is needed to determine the suitability and limitations of any area within this map unit for cropland.
- Using conservation practices, such as contour farming, winter cover crops, and crop rotations which include grasses and legumes, helps to minimize soil erosion, maximize the infiltration of rainfall, increase the available water capacity, and improve soil fertility.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes crop productivity.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.

Pasture and hayland
Suitability: Pasture—poorly suited; hayland—unsuited
Management concerns: Equipment use, erodibility, pesticide retention, and soil fertility
Management measures and considerations:
- The slope and surface boulders limit the use of equipment and may be hazardous.
- Growing adapted plants helps to ensure the production of high-quality forage and minimize soil erosion.
- Fencing livestock away from creeks and streams helps to prevent streambank erosion and sedimentation.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using rotational grazing, implementing a well planned harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.

Orchard and ornamental crops
Suitability: Lonon—suited; Northcove—unsuited
Management concerns: Equipment use, ball and burlap harvesting, erodibility, climate, pesticide retention, and soil fertility

Figure 18.—Pure stands of even-aged yellow-poplar, which occur when pastureland is abandoned on colluvial soils, on Lonon soil in an area of Lonon-Northcove complex, 15 to 30 percent slopes, bouldery.

Management measures and considerations:
- This map unit is severely limited for orchard and ornamental crops because of the slope, erodibility, bouldery surface, and the high content of rock fragments in the Northcove soil.
- Establishing and maintaining sod between rows and on access roads helps to reduce the hazard of erosion.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximize productivity.

Woodland Management and Productivity

Potential for commercial species: High for cove hardwoods
Suitability: Suited (fig. 18)
Management concerns: Equipment use, erodibility, and pesticide retention
Management measures and considerations:
- Using cable logging methods helps to overcome limited road and trail construction caused by the large number of stones and boulders on the soil surface.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.

- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.
- Avoiding logging operations during periods when the soil is saturated helps to prevent rutting of the soil surface and damage to tree roots due to soil compaction.
- Leaving a buffer zone of trees and shrubs adjacent to streams helps to minimize siltation and provides shade for the aquatic habitat.
- Livestock should not be allowed to graze in areas managed for woodland.

Urban Development

Dwellings

Suitability: Lonon—suited; Northcove—poorly suited
Management concerns: Lonon—slope, large stones, erodibility, seeps and springs, and corrosivity; Northcove—slope, large stones, erodibility, seeps and springs, corrosivity, and unstable excavation walls
Management measures and considerations:
- An onsite investigation is needed to determine the suitability and limitations of any area within this map unit.
- Designing structures so that they conform with natural slopes helps to improve soil performance.
- Large stones and boulders will be encountered during excavation.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Installing a subsurface drainage system around foundations helps to intercept water from seeps and springs.
- Locating structures away from intermittent and perennial drainageways helps to minimize structural damage from overland flow of storm water.
- Using corrosion-resistant materials helps to reduce the risk of damage to concrete.
- Installing permanent retaining walls helps to improve soil stability.

Septic tank absorption fields

Suitability: Lonon—suited; Northcove—unsuited
Management concerns: Lonon—slope, large stones, and seeps and springs; Northcove—slope, large stones, seeps and springs, and poor filtering capacity
Management measures and considerations:
- Contact the local Health Department for guidance on sanitary facilities.
- Installing distribution lines on the contour helps to improve the performance of septic tank absorption fields.
- Large stones and boulders will be encountered during excavation.
- Excavations may cut into seeps and springs. These areas should be avoided.
- Measures that improve the filtering capacity should be considered; the Northcove soil readily absorbs but does not adequately filter effluent.

Local roads and streets

Suitability: Poorly suited
Management concerns: Lonon—slope, erodibility, large stones and boulders, seeps and springs, and frost action; Northcove—slope, erodibility, large stones and boulders, seeps and springs, and differential settling
Management measures and considerations:
- Large stones and boulders will be encountered during excavation.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.

- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Large stones and boulders will be encountered during excavation.
- Intercepting and diverting underground water from seeps and springs helps to stabilize cut and fill slopes.
- The Northcove soil is subject to uneven settling and may be unstable if not properly compacted.
- The permanent surfacing of roads or the use of suitable subgrade or base material allows the year-round use of roads and helps to reduce the damage from frost heaving.

Lawns and landscaping
Suitability: Poorly suited
Management concerns: Slope, erodibility, large stones and boulders, climate, pesticide retention, and soil fertility
Management measures and considerations:
- The slope, bouldery surface, and the high content of rock fragment in the Northcove soil are limitations affecting lawns and landscaping.
- Designing plantings on natural contours helps to increase water infiltration.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.
- Using lime, fertilizer, mulch, and irrigation helps to establish lawns and landscape plants.
- Topsoil should be stockpiled from disturbed areas and replaced before landscaping.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.

Interpretive Groups

Land capability classification: Lonon—4e; Northcove—6s

LtD—Luftee-Anakeesta complex, windswept, 15 to 30 percent slopes, very rocky

Setting

Landscape: High mountains, around Cheoah Bald to the east near Swain County and around Joanna Bald near Cherokee County in the southern part of the county
Elevation range: 4,200 to 5,420 feet
Landform: Ridges
Landform position: Summits and upper side slopes
Shape of areas: Long and narrow or irregular
Size of areas: Up to 35 acres

Map Unit Composition

Luftee soil and similar inclusions: 55 percent
Anakeesta soil and similar inclusions: 30 percent
Rock outcrop: 7 percent
Dissimilar inclusions: 8 percent

Typical Profile

Luftee

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 11 inches—very dark brown very channery loam

Subsoil:
11 to 20 inches—very dark grayish brown extremely channery loam
20 to 34 inches—yellowish brown extremely channery sandy loam

Bedrock:
34 to 80 inches—unweathered, hard Anakeesta slate

Anakeesta

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 8 inches—very dark grayish brown channery loam

Subsoil:
8 to 14 inches—dark brown very channery loam
14 to 45 inches—dark yellowish brown extremely channery loam

Bedrock:
45 to 80 inches—unweathered, hard, fractured Anakeesta slate

Soil Properties and Qualities

Depth class: Luftee—moderately deep; Anakeesta—deep
Drainage class: Well drained
General texture class: Loamy-skeletal
Permeability: Moderately rapid
Available water capacity: Low
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Moderately steep
Soil slippage potential: Low
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: About 3 percent cobbles and stones that average about 3 to 24 inches in length and are about 3 to 25 feet apart
Extent of Rock outcrop: About 7 percent of the soil surface
Organic matter content of surface layer: Very high
Potential for frost action: Moderate
Special climatic conditions: Soils subject to prolonged freezing temperatures and rime ice in winter, high winds, high rainfall, and a short growing season
Soil reaction: Extremely acid to strongly acid throughout the profile
Parent material: Residuum weathered from low-grade metasedimentary rock, primarily sulfidic slate
Depth to bedrock: Luftee—20 to 40 inches to hard bedrock; Anakeesta—40 to 60 inches to hard bedrock
Other distinctive properties: Random areas of seeps and springs; soils commonly associated with geologic formations that contain a high amount of sulfur-bearing rock; water movement along bedrock contacts in areas of the Luftee soil

Minor Components

Dissimilar inclusions:
- Soils that have hard bedrock at a depth of 1 to 20 inches, adjacent to rock outcrops
- Chiltoskie soils that have loamy subsoils and have bedrock at a depth of more than 60 inches, in concave areas at the head of drains and in saddles and gaps
- Soils that have thinner surface layers with less organic matter and have bedrock at a depth of 20 to more than 60 inches, at elevations below 4,800 feet
- Random areas of soils on slopes of less than 15 percent or more than 30 percent

Similar inclusions:
- Luftee and Anakeesta soils that have surface layers of fine sandy loam or sandy loam

Land Use

Dominant Uses: Wildlife habitat and recreation

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, damaging high winds, very stony surface, and short growing season. A site should be selected on better suited soils.

Pasture and hayland
Suitability: Poorly suited
Management concerns: Luftee—equipment use, erodibility, climate, pesticide retention, soil fertility, rooting depth, and droughtiness; Anakeesta—equipment use, erodibility, climate, pesticide retention, and soil fertility
Management measures and considerations:
- The slope, erodibility, very stony surface, damaging high winds, and short growing season are limitations affecting pasture and hayland.
- The slope limits the use of equipment in the steeper areas.
- Growing adapted plants helps to ensure the production of high-quality forage and minimize soil erosion.
- These soils may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using rotational grazing, implementing a well planned harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.
- Due to the low available water caused by the moderately deep rooting depth, the Luftee soil is difficult to manage for the production of pasture and hay crops.

Orchard and ornamental crops
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for orchard and ornamental crops because of the damaging high winds, short growing season, very stony surface, and the depth to bedrock and droughtiness in areas of the Luftee soil. A site should be selected on better suited soils.

Woodland Management and Productivity

Potential for commercial species: Very low
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for timber production because of the damaging high winds, short growing season, very stony surface, and the depth to bedrock in areas of the Luftee soil. A site should be selected on better suited soils.

Urban Development

Dwellings
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for dwellings because of the erodibility, climate, high content of rock fragments, depth to bedrock, and extent of rock outcrops. In addition, the underlying bedrock is susceptible to mass movement.
- These soils are commonly associated with geologic formations that contain a high amount of sulfur-bearing rock. Thus, there is a risk of exposing fresh iron pyrite to weathering. This weathering releases sulfur into the environment, allowing the formation of sulfuric acid. Sulfuric acid rapidly lowers the pH in streams, adversely affecting water quality and aquatic life. A site should be selected on better suited soils.

Septic tank absorption fields
Suitability: Poorly suited
Management concerns: Luftee—slope, climate, prolonged freezing temperatures, and depth to bedrock; Anakeesta—slope, climate, and prolonged freezing temperatures
Management measures and considerations:
- Contact the local Health Department for guidance on sanitary facilities.
- Installing distribution lines on the contour helps to improve the performance of septic tank absorption fields.
- Design modifications are needed to overcome prolonged freezing temperatures.
- Locating and using areas of the deeper Anakeesta soil may improve the performance of filter fields.

Local roads and streets
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for roads and streets because of the slope, erodibility, high content of rock fragments, depth to bedrock, and extent of rock outcrops. In addition, the underlying bedrock is susceptible to mass movement.
- These soils are commonly associated with geologic formations that contain a high amount of sulfur-bearing rock. Thus, there is a risk of exposing fresh iron pyrite to weathering. This weathering releases sulfur into the environment, allowing the formation of sulfuric acid. Sulfuric acid rapidly lowers the pH in streams, adversely affecting water quality and aquatic life. A site should be selected on better suited soils.

Lawns and landscaping
Suitability: Poorly suited
Management concerns:
- This map unit is severely limited for lawns and landscaping because of the slope, erodibility, damaging high winds, short growing season, very stony surface, and the depth to bedrock and droughtiness in areas of the Luftee soil. A site should be selected on better suited soils.

Interpretive Groups

Land capability classification: 6s

LtE—Luftee-Anakeesta complex, windswept, 30 to 50 percent slopes, very rocky

Setting

Landscape: High mountains, around Cheoah Bald to the east near Swain County and around Joanna Bald near Cherokee County in the southern part of the county
Elevation range: 4,200 to 4,800 feet
Landform: Ridges and mountain slopes
Landform position: Summits and side slopes
Shape of areas: Long and narrow or irregular
Size of areas: Up to 17 acres

Map Unit Composition

Luftee soil and similar inclusions: 55 percent
Anakeesta soil and similar inclusions: 30 percent
Rock outcrop: 7 percent
Dissimilar inclusions: 8 percent

Typical Profile

Luftee

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 11 inches—very dark brown very channery loam

Subsoil:
11 to 20 inches—very dark grayish brown extremely channery loam
20 to 34 inches—yellowish brown extremely channery sandy loam

Bedrock:
34 to 80 inches—unweathered, hard Anakeesta slate

Anakeesta

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 8 inches—very dark grayish brown channery loam

Subsoil:
8 to 14 inches—dark brown very channery loam
14 to 45 inches—dark yellowish brown extremely channery loam

Bedrock:
45 to 80 inches—unweathered, hard, fractured Anakeesta slate

Soil Properties and Qualities

Depth class: Luftee—moderately deep; Anakeesta—deep
Drainage class: Well drained
General texture class: Loamy-skeletal
Permeability: Moderately rapid
Available water capacity: Low
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None

Shrink-swell potential: Low
Slope class: Steep
Soil slippage potential: Medium
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: About 3 percent flagstones and stones that average about 6 to 24 inches in length and are about 3 to 25 feet apart
Extent of Rock outcrop: About 7 percent of the soil surface
Organic matter content of surface layer: Very high
Potential for frost action: Moderate
Special climatic conditions: Soils subject to prolonged freezing temperatures and rime ice in winter, high winds, high rainfall, and a short growing season
Soil reaction: Extremely acid to strongly acid throughout the profile
Parent material: Residuum affected by soil creep in the upper part, weathered from low-grade metasedimentary rock, primarily sulfidic slate
Depth to bedrock: Luftee—20 to 40 inches to hard bedrock; Anakeesta—40 to 60 inches to hard bedrock
Other distinctive properties: Random areas of seeps and springs; potential for downslope movement when lateral support is removed; soils commonly associated with geologic formations that contain a high amount of sulfidic material; water movement along bedrock contacts in areas of the Luftee soil

Minor Components

Dissimilar inclusions:
- Soils that have hard bedrock at a depth of 1 to 20 inches, adjacent to rock outcrops
- Heintooga soils that have more rock fragments in the subsoil, below rock outcrops and in drainageways
- Chiltoskie soils that have loamy subsoils and have bedrock at a depth of more than 60 inches, in concave areas at the head of drains and in saddles and gaps
- Soils that have thinner surface layers with less organic matter and have bedrock at a depth of 20 to more than 60 inches, on south- to west-facing slopes
- Random areas of soils on slopes of less than 30 percent or more than 50 percent

Similar inclusions:
- Luftee and Anakeesta soils that have surface layers of fine sandy loam or sandy loam

Land Use

Dominant Uses: Wildlife habitat

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, damaging high winds, very stony surface, and short growing season. A site should be selected on better suited soils.

Pasture and hayland
Suitability: Pasture—poorly suited; hayland—unsuited
Management concerns:
- This map unit is difficult to manage for pasture and hay production because of the slope, erodibility, damaging high winds, short growing season, very stony surface, and the depth to bedrock and droughtiness in areas of the Luftee soil. A site should be selected on better suited soils.

Orchard and ornamental crops
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for orchard and ornamental crops because of the slope, erodibility, damaging high winds, short growing season, very stony surface, and the depth to bedrock and droughtiness in areas of the Luftee soil. A site should be selected on better suited soils.

Woodland Management and Productivity

Potential for commercial species: Very low
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for timber production because of the damaging high winds, short growing season, low productivity, very stony surface, and the depth to bedrock in the Luftee soil. A site should be selected on better suited soils.

Urban Development

Dwellings
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for dwellings because of the erodibility, climate, high content of rock fragments, depth to bedrock, and extent of rock outcrops. In addition, the underlying bedrock is susceptible to mass movement.
- These soils are commonly associated with geologic formations that contain a high amount of sulfur-bearing rock. Thus, there is a risk of exposing fresh iron pyrite to weathering. This weathering releases sulfur into the environment, allowing the formation of sulfuric acid. Sulfuric acid rapidly lowers the pH in streams, adversely affecting water quality and aquatic life. A site should be selected on better suited soils.

Septic tank absorption fields
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for septic tank absorption fields because of the slope, climate, high content of rock fragments, depth to bedrock, and extent of rock outcrops. A site should be selected on better suited soils.

Local roads and streets
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for roads and streets because of the slope, erodibility, high content of rock fragments, depth to bedrock, and extent of rock outcrops. In addition, the underlying bedrock is susceptible to mass movement.
- These soils are commonly associated with geologic formations that contain a high amount of sulfur-bearing rock. Thus, there is a risk of exposing fresh iron pyrite to weathering. This weathering releases sulfur into the environment, allowing the formation of sulfuric acid. Sulfuric acid rapidly lowers the pH in streams, adversely affecting water quality and aquatic life. A site should be selected on better suited soils.

Lawns and landscaping
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for lawns and landscaping because of the slope, erodibility, damaging high winds, short growing season, very stony surface, and

the depth to bedrock and droughtiness in areas of the Luftee soil. A site should be selected on better suited soils.

Interpretive Groups

Land capability classification: 7s

LtF—Luftee-Anakeesta complex, windswept, 50 to 95 percent slopes, very rocky

Setting

Landscape: High mountains, around Cheoah Bald to the east near Swain County and around Joanna Bald near Cherokee County in the southern part of the county
Elevation range: 4,200 to 5,360 feet
Landform: Mountain slopes
Landform position: Side slopes
Shape of areas: Irregular
Size of areas: Up to 45 acres

Map Unit Composition

Luftee soil and similar inclusions: 55 percent
Anakeesta soil and similar inclusions: 30 percent
Rock outcrop: 7 percent
Dissimilar inclusions: 8 percent

Typical Profile

Luftee

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 11 inches—very dark brown very channery loam

Subsoil:
11 to 20 inches—very dark grayish brown extremely channery loam
20 to 34 inches—yellowish brown extremely channery sandy loam

Bedrock:
34 to 80 inches—unweathered, hard Anakeesta slate

Anakeesta

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 8 inches—very dark grayish brown channery loam

Subsoil:
8 to 14 inches—dark brown very channery loam
14 to 45 inches—dark yellowish brown extremely channery loam

Bedrock:
45 to 80 inches—unweathered, hard, fractured Anakeesta slate

Soil Properties and Qualities

Depth class: Luftee—moderately deep; Anakeesta—deep
Drainage class: Well drained
General texture class: Loamy-skeletal

Permeability: Moderately rapid
Available water capacity: Low
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Very steep
Soil slippage potential: Medium
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: About 3 percent flagstones and stones that average about 6 to 24 inches in length and are about 3 to 25 feet apart
Extent of Rock outcrop: About 7 percent of the soil surface
Organic matter content of surface layer: Very high
Potential for frost action: Moderate
Special climatic conditions: Soils subject to prolonged freezing temperatures and rime ice in winter, high winds, high rainfall, and a short growing season
Soil reaction: Extremely acid to strongly acid throughout the profile
Parent material: Residuum affected by soil creep in the upper part, weathered from low-grade metasedimentary rock, primarily sulfidic slate
Depth to bedrock: Luftee—20 to 40 inches to hard bedrock; Anakeesta—40 to 60 inches to hard bedrock
Other distinctive properties: Random areas of seeps and springs; potential for downslope movement when lateral support is removed; soils commonly associated with geologic formations that contain a high amount of sulfidic material; water movement along bedrock contacts in areas of the Luftee soil

Minor Components

Dissimilar inclusions:
- Soils that have hard bedrock at a depth of 1 to 20 inches, adjacent to rock outcrops
- Heintooga soils that have more rock fragments in the subsoil, below rock outcrops and in drainageways
- Chiltoskie soils that have loamy subsoils and have bedrock at a depth of more than 60 inches, in concave areas at the head of drains
- Soils that have thinner surface layers with less organic matter and have bedrock at a depth of 20 to more than 60 inches, at elevations below 4,800 feet
- Random areas of soils on slopes of less than 50 percent or more than 95 percent

Similar inclusions:
- Luftee and Anakeesta soils that have surface layers of fine sandy loam or sandy loam

Land Use

Dominant Uses: Wildlife habitat

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, damaging high winds, very stony surface, and short growing season. A site should be selected on better suited soils.

Pasture and hayland
Suitability: Pasture—poorly suited; hayland—unsuited

Management concerns:
- This map unit is difficult to manage for pasture and hay production because of the slope, erodibility, damaging high winds, short growing season, very stony surface, and the depth to bedrock and droughtiness in areas of the Luftee soil. A site should be selected on better suited soils.

Orchard and ornamental crops
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for orchard and ornamental crops because of the slope, erodibility, damaging high winds, short growing season, very stony surface, and the depth to bedrock and droughtiness in areas of the Luftee soil. A site should be selected on better suited soils.

Woodland Management and Productivity

Potential for commercial species: Very low
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for timber production because of the damaging high winds, short growing season, low productivity, very stony surface, and the depth to bedrock in the Luftee soil. A site should be selected on better suited soils.

Urban Development

Dwellings
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for dwellings because of the erodibility, climate, high content of rock fragments, depth to bedrock, and extent of rock outcrops. In addition, the underlying bedrock is susceptible to mass movement.
- These soils are commonly associated with geologic formations that contain a high amount of sulfur-bearing rock. Thus, there is a risk of exposing fresh iron pyrite to weathering. This weathering releases sulfur into the environment, allowing the formation of sulfuric acid. Sulfuric acid rapidly lowers the pH in streams, adversely affecting water quality and aquatic life. A site should be selected on better suited soils.

Septic tank absorption fields
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for septic tank absorption fields because of the slope, climate, high content of rock fragments, depth to bedrock, and extent of rock outcrops. A site should be selected on better suited soils.

Local roads and streets
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for roads and streets because of the slope, erodibility, high content of rock fragments, depth to bedrock, and extent of rock outcrops. In addition, the underlying bedrock is susceptible to mass movement.
- These soils are commonly associated with geologic formations that contain a high amount of sulfur-bearing rock. Thus, there is a risk of exposing fresh iron pyrite to weathering. This weathering releases sulfur into the environment, allowing the formation of sulfuric acid. Sulfuric acid rapidly lowers the pH in streams, adversely affecting water quality and aquatic life. A site should be selected on better suited soils.

Lawns and landscaping
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for lawns and landscaping because of the slope, erodibility, damaging high winds, short growing season, very stony surface, and the depth to bedrock and droughtiness in areas of the Luftee soil. A site should be selected on better suited soils.

Interpretive Groups

Land capability classification: 7s

NtE—Northcove-Lonon complex, 30 to 50 percent slopes, very bouldery

Setting

Landscape: Low and intermediate mountains and intermountain hills, dominantly in the central and eastern parts of the county
Elevation range: 1,330 to 4,340 feet
Landform: Coves, colluvial fans, drainageways, and benches
Landform position: Head slopes and footslopes
Shape of areas: Long and narrow or irregular
Size of areas: Up to 47 acres

Map Unit Composition

Northcove soil and similar inclusions: 55 percent
Lonon soil and similar inclusions: 40 percent
Dissimilar inclusions: 5 percent

Typical Profile

Northcove

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 8 inches—dark yellowish brown very channery loam

Subsoil:
8 to 30 inches—strong brown very channery loam
30 to 80 inches—strong brown extremely stony loam

Lonon

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 8 inches—dark yellowish brown channery loam

Subsoil:
8 to 40 inches—strong brown channery clay loam
40 to 80 inches—strong brown channery loam

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
General texture class: Northcove—loamy with many rock fragments; Lonon—loamy
Permeability: Moderately rapid
Available water capacity: Northcove—low or moderate; Lonon—moderate

Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Steep
Soil slippage potential: Northcove—medium; Lonon—low
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: About 3 percent stones and boulders that average about 15 to 48 inches in length and are about 10 to 65 feet apart
Organic matter content of surface layer: Moderate or high
Potential for frost action: Northcove—low; Lonon—moderate
Special climatic conditions: Soils subject to slow air drainage, which allows late spring and early fall frosts
Soil reaction: Northcove—extremely acid to moderately acid throughout; Lonon—very strongly acid or strongly acid throughout
Parent material: Colluvium derived from low-grade metasedimentary rock
Depth to bedrock: More than 60 inches
Other distinctive properties: Random areas of seeps and springs; soils subject to overland flow of storm water from adjacent uplands; soil slippage potential when soils are saturated; a high content of rock fragments in the Northcove soil

Minor Components

Dissimilar inclusions:
- Areas of rubble land, below rock outcrops and in drainageways
- Soils that have bedrock at a depth of less than 6.0 feet, in drainageways and on the outer edge of map unit delineations
- Soils that have a seasonal high water table at a depth of less than 6.0 feet, in depressions and on toeslopes
- Soils that are poorly drained, in areas of seeps and springs
- Random areas of soils on slopes of less than 30 percent or more than 50 percent

Similar inclusions:
- Northcove and Lonon soils that have surface layers of fine sandy loam or sandy loam

Land Use

Dominant Uses: Woodland and wildlife habitat
Other Uses: Recreation, building site development, and pasture

Agricultural Development

Cropland

Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, and very bouldery surface. A site should be selected on better suited soils.

Pasture and hayland

Suitability: Pasture—poorly suited; hayland—unsuited
Management concerns: Equipment use, erodibility, pesticide retention, and soil fertility
Management measures and considerations:
- The slope and surface boulders limit the use of equipment and may be hazardous.
- Growing adapted plants helps to ensure the production of high-quality forage and minimize soil erosion.

- Fencing livestock away from creeks and streams helps to prevent streambank erosion and sedimentation.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using rotational grazing and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.

Orchard and ornamental crops
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for orchard and ornamental crops because of the slope, erodibility, very bouldery surface, and the high content of rock fragments in the Northcove soil. A site should be selected on better suited soils.

Woodland Management and Productivity

Potential for commercial species: High for cove hardwoods
Suitability: Suited
Management concerns: Equipment use and erodibility
Management measures and considerations:
- Using cable logging methods helps to overcome, especially in areas where slope exceeds 40 percent, limited road and trail construction caused by the large number of stones and boulders on the soil surface.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.
- Avoiding logging operations during periods when the soil is saturated helps to prevent rutting of the soil surface and damage to tree roots due to soil compaction.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Leaving a buffer zone of trees and shrubs adjacent to streams helps to minimize siltation and provides shade for the aquatic habitat.
- Livestock should not be allowed to graze in areas managed for woodland.

Urban Development

Dwellings
Suitability: Northcove—unsuited; Lonon—poorly suited
Management concerns: Northcove—slope, large stones and boulders, erodibility, seeps and springs, corrosivity, and unstable excavation walls; Lonon—slope, large stones and boulders, erodibility, seeps and springs, and corrosivity
Management measures and considerations:
- An onsite investigation is needed to determine the suitability and limitations of any area within this map unit.
- Large stones and boulders will be encountered during excavation.
- Designing structures on the contour with the natural slope or building in less sloping areas helps to improve soil performance.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Installing a subsurface drainage system around foundations helps to intercept water from seeps and springs.

- Locating structures away from intermittent and perennial drainageways helps to minimize structural damage from overland flow of storm water.
- Using corrosion-resistant materials helps to reduce the risk of damage to uncoated steel and concrete.
- Installing permanent retaining walls helps to improve soil stability.

Septic tank absorption fields

Suitability: Northcove—unsuited; Lonon—poorly suited

Management concerns: Northcove—large stones and boulders, slope, seeps and springs, and poor filtering capacity; Lonon—large stones and boulders, slope, and seeps and springs

Management measures and considerations:

- Contact the local Health Department for guidance on sanitary facilities.
- Large stones and boulders will be encountered during excavation.
- Installing distribution lines on the contour helps to improve the performance of septic tank absorption fields.
- Excavations may cut into seeps and springs. These areas should be avoided.
- Measures that improve the filtering capacity should be considered; the Northcove soil readily absorbs but does not adequately filter effluent.

Local roads and streets

Suitability: Poorly suited

Management concerns: Northcove—slope, erodibility, large stones and boulders, seeps and springs, and differential settling; Lonon—slope, erodibility, large stones and boulders, seeps and springs, and frost action

Management measures and considerations:

- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Large stones and boulders will be encountered during excavation.
- Intercepting and diverting underground water from seeps and springs helps to stabilize cut and fill slopes.
- The Northcove soil is subject to uneven settling and may be unstable if not properly compacted.
- The permanent surfacing of roads or the use of suitable subgrade or base material allows the year-round use of roads and helps to reduce the damage from frost heaving.

Lawns and landscaping

Suitability: Poorly suited

Management concerns: Slope, erodibility, large stones and boulders, climate, pesticide retention, and soil fertility

Management measures and considerations:

- This map unit is severely limited for lawns and landscaping because of the slope, very bouldery surface, and the high content of rock fragments in the Northcove soil.
- Designing plantings on natural contours helps to increase water infiltration.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.
- Using lime, fertilizer, mulch, and irrigation helps to establish lawns and landscape plants.
- Topsoil should be stockpiled from disturbed areas and replaced before landscaping.

• In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.

Interpretive Groups

Land capability classification: 6s

RdA—Reddies fine sandy loam, 0 to 3 percent slopes, occasionally flooded

Setting

Landscape: Mountain valleys of low and intermediate mountains and intermountain hills throughout the county
Elevation range: 1,270 to 2,960 feet
Landform: Flood plains dominantly at the upper end of mountain valleys
Landform position: Planar to slightly convex bottomland slopes
Shape of areas: Long and narrow
Size of areas: Up to 241 acres

Map Unit Composition

Reddies soil and similar inclusions: 80 percent
Dissimilar inclusions: 20 percent

Typical Profile

Surface layer:
0 to 12 inches—dark brown fine sandy loam

Subsoil:
12 to 22 inches—yellowish brown loam
22 to 27 inches—yellowish brown fine sandy loam

Underlying material:
27 to 31 inches—yellowish brown loamy sandy
31 to 80 inches—multicolored very cobbly loamy sand

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Moderately well drained
General texture class: Loamy in the upper part and sandy or sandy-skeletal in the lower part
Permeability: Moderately rapid in the surface horizon and subsoil and rapid or very rapid in the underlying material
Available water capacity: Very low
Depth to seasonal high water table: 2.0 to 3.5 feet from December through May and 2.5 to 4.0 feet from June through November
Hazard of flooding: Occasional, throughout the year with standing water for less than 2 days
Shrink-swell potential: Low
Slope class: Nearly level or gently sloping
Soil slippage potential: None
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: None or slight

Organic matter content of surface layer: High
Potential for frost action: Moderate
Special climatic conditions: Soil subject to slow air drainage, which allows late spring and early fall frosts
Soil reaction: Very strongly acid to neutral throughout the profile
Parent material: Alluvium derived primarily from low-grade metasedimentary rock
Depth to bedrock: More than 60 inches
Depth to contrasting material: 20 to 40 inches to deposits of gravel and cobbles that are stratified with sandy or loamy material
Other distinctive properties: Soil subject to scouring and deposition during flooding

Minor Components

Dissimilar inclusions:
- Soils that are rarely flooded, on the wider flood plains
- Soils that are well drained to excessively well drained, in wider units and those adjacent to deeper stream channels
- Somewhat poorly drained Cullowhee and poorly drained Ela soils that have subsoils that are loamy in the upper part and that have strata with a high content of rock fragments at a depth of 20 to 40 inches, in depressions, old stream channels, and backwater areas
- Dellwood soils that have deposits of gravel and cobbles that are stratified with sandy or loamy material, at a depth of 8 to 20 inches
- Well drained soils that have strata with a high content of rock fragments at a depth of more than 40 inches, in the slightly higher-lying positions
- Moderately well drained Dillard soils that have more clay and fewer rock fragments in the subsoil, on low stream terraces and toeslopes
- Soils on slopes of more than 3 percent adjacent to uplands and stream channels

Similar inclusions:
- Reddies soils that have surface layers of sandy loam or loam

Land Use

Dominant Uses: Cropland and ornamental crops
Other Uses: Pasture, hayland, recreation, and wildlife habitat

Agricultural Development

Cropland
Suitability: Well suited
Management concerns: Flooding, droughtiness, pesticide retention, soil fertility, nutrient leaching, and climate
Management measures and considerations:
- While most flooding occurs during the winter months, there is a risk of crop loss during the growing season.
- This soil has a low available water capacity and becomes droughty during periods of low rainfall.
- Using conservation tillage, winter cover crops, crop residue management, and crop rotations which include grasses and legumes helps to increase the available water capacity and improve soil fertility.
- This soil may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides.

- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes crop productivity.
- Using split applications helps to increase the effectiveness of lime and fertilizer and helps to avoid the leaching of plant nutrients below the rooting zone and into the water table.
- Using frequent and light applications of irrigation water helps to avoid the leaching of plant nutrients below the rooting zone.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.

Pasture and hayland
Suitability: Well suited
Management concerns: Flooding, droughtiness, pesticide retention, soil fertility, nutrient leaching, and erodibility
Management measures and considerations:
- While most flooding occurs during the winter months, there is a risk of crop loss during the growing season.
- This soil has a low available water capacity and becomes droughty during periods of low rainfall.
- Using supplemental irrigation and crop varieties adapted to droughty conditions helps to increase crop production.
- This soil may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using split applications helps to increase the effectiveness of lime and fertilizer and helps to avoid the leaching of plant nutrients below the rooting zone and into the water table.
- Using rotational grazing, implementing a well planned harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.
- Fencing livestock away from creeks and streams helps to prevent streambank erosion and sedimentation.

Orchard and ornamental crops
Suitability: Orchards—unsuited; ornamental crops—poorly suited
Management concerns: Flooding, droughtiness, root disease, climate, soil fertility, nutrient leaching, pesticide retention, and ball and burlap harvesting
Management measures and considerations:
- Because of the potential for flooding, this soil can be difficult to manage for orchard or ornamental crops.
- This soil has a low available water capacity and becomes droughty during periods of low rainfall.
- Because of the seasonal high water table and flooding, phytophthora root disease is a potential limitation for Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as toeslopes and drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximize productivity.

- Using split applications helps to increase the effectiveness of lime and fertilizer and helps to avoid the leaching of plant nutrients below the rooting zone and into the water table.
- Using frequent and light applications of irrigation water helps to avoid the leaching of plant nutrients below the rooting zone.
- This soil may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Avoiding ball and burlap harvesting during dry periods helps to prevent fracture of the ball and separation of the soil from the roots caused by a low moisture content and a minimal clay content.

Woodland Management and Productivity

Potential for commercial species: Moderately high for cove hardwoods
Suitability: Well suited
Management concerns: Flooding and pesticide retention
Management measures and considerations:
- The potential for flooding needs to be considered in the placement of haul roads and log landings.
- Soil-applied herbicides are retained due to herbicide-organic matter bonding and may damage tree seedlings when cropland is converted to woodland.

Urban Development

Dwellings

Suitability: Unsuited
Management concerns:
- This map unit is severely limited for dwellings because of the flooding and wetness. A site should be selected on better suited soils.

Septic tank absorption fields

Suitability: Unsuited
Management concerns:
- This map unit is severely limited for septic tank absorption fields because of the wetness and poor filtering capacity. Contact the local Health Department for additional guidance.

Local roads and streets

Suitability: Unsuited
Management concerns:
- This map unit is severely limited for roads and streets because of the flooding. A site should be selected on better suited soils.

Lawns and landscaping

Suitability: Suited
Management concerns: Flooding, droughtiness, pesticide retention, soil fertility, nutrient leaching, root disease, and climate
Management measures and considerations:
- Because of the flooding, this soil is difficult to manage and use is severely limited during periods of inundation.
- Using lime, fertilizer, mulch, irrigation, and varieties adapted to droughty conditions helps to establish lawns and landscape plants. Split applications help to increase the effectiveness of lime and fertilizer.
- Using frequent and light applications of irrigation water helps to avoid the leaching of plant nutrients below the rooting zone.

- This soil may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to landscape plants.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Because of the seasonal high water table and flooding, phytophthora root disease is a potential limitation for Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as toeslopes and drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.

Interpretive Groups

Land capability classification: 2w

SbE—Snowbird loam, 30 to 50 percent slopes, stony

Setting

Landscape: Intermountain hills and low mountains throughout the county
Elevation range: 1,440 to 3,690 feet
Landform: North- to east-facing hillslopes and mountain slopes and those slopes shaded by the higher mountains
Landform position: Side slopes and head slopes
Shape of areas: Irregular
Size of areas: Up to 127 acres

Map Unit Composition

Snowbird soil and similar inclusions: 85 percent
Dissimilar inclusions: 15 percent

Typical Profile

Surface layer:
0 to 3 inches—moderately decomposed plant material
3 to 10 inches—dark brown loam

Subsoil:
10 to 13 inches—dark brown loam
13 to 22 inches—brown sandy clay loam
22 to 34 inches—strong brown very fine sandy loam
34 to 57 inches—dark yellowish brown channery very fine sandy loam

Bedrock:
57 to 80 inches—weathered, interbedded metasandstone and phyllite

Soil Properties and Qualities

Depth class: Deep
Drainage class: Well drained
General texture class: Loamy
Permeability: Moderate
Available water capacity: Moderate or high
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Steep

Soil slippage potential: Low
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: Widely scattered flagstones and stones that average about 6 to 24 inches in length and are about 25 to 75 feet apart
Organic matter content of surface layer: High or very high
Potential for frost action: Moderate
Special climatic conditions: Soil subject to cooler annual air temperatures, which allow late spring and early frosts; a higher soil moisture content due to north- to east-facing aspects and shading by the higher mountains
Soil reaction: Very strongly acid to moderately acid throughout the profile
Parent material: Residuum affected by soil creep in the upper part, weathered from low-grade metasedimentary rock
Depth to bedrock: 40 to 60 inches to soft bedrock
Other distinctive properties: Potential for downslope movement when lateral support is removed

Minor Components

Dissimilar inclusions:
- Junaluska and Brasstown soils that have thinner surface layers with less organic matter, have redder subsoils, and have soft bedrock at a depth of 20 to 60 inches; on south- to west-facing side slopes and spur ridges
- Random areas of soils that have more mica in the subsoil and have bedrock at a depth of 20 to more than 60 inches
- Random areas of Soco and Stecoah soils that have thinner surface layers with less organic matter, have less clay in the subsoil, and have soft bedrock at a depth of 20 to 60 inches; on south- to west-facing side slopes and spur ridges
- Santeetlah soils that have bedrock at a depth of more than 60 inches, on toeslopes, on benches, and in concave areas at the heads of drains
- Random areas of soils on slopes of less than 30 percent or more than 50 percent
- Thurmont soils that have a water table at a depth of 40 to 60 inches, on toeslopes and in drainageways
- Cheoah and Jeffrey soils that have less clay in the subsoil and have hard bedrock at 20 to 60 inches, adjacent to widely scattered rock outcrops

Similar inclusions:
- Snowbird soils that have surface layers of sandy loam or fine sandy loam
- Random areas of similar soils that have a red subsoil

Land Use

Dominant Uses: Woodland and wildlife habitat
Other Uses: Pasture and building site development

Agricultural Development

Cropland

Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope and erodibility. A site should be selected on better suited soils.

Pasture and hayland

Suitability: Pasture—poorly suited; hayland—unsuited
Management concerns: Equipment use, erodibility, pesticide retention, and soil fertility

Management measures and considerations:
- Because of the slope, this map unit is difficult to manage for pasture and hayland.
- Growing adapted plants helps to ensure the production of high-quality forage and minimize soil erosion.
- This soil may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Applying lime and fertilizer according to recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using rotational grazing and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.

Orchard and ornamental crops
Suitability: Poorly suited
Management concerns: Equipment use, erodibility, pesticide retention, ball and burlap harvesting, plant shape, climate, and soil fertility
Management measures and considerations:
- This soil may be difficult to manage for orchard or ornamental crops because the slope limits equipment use.
- Establishing and maintaining sod between rows and on access roads helps to reduce the hazard of erosion.
- Applying lime and fertilizer according to recommendations based on soil tests helps to increase the availability of plant nutrients and maximize productivity.
- This soil may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effetive than soil-applied pesticides.
- Avoiding ball and burlap harvesting during extreme moisture conditions helps to prevent fracture or deformation of the ball and tearing of the roots.
- Because of the cooler air temperatures associated with the north- to east-facing aspects of this map unit, late spring frost may damage new growth in some years.
- The slope affects the shape of ornamentals on the uphill side.
- Because of the restricted movement of air and water due to the clay content of the subsoil, there is a potential for phytophthora root disease. As a result, this map unit is limited for the production of Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.

Woodland Management and Productivity

Potential for commercial species: Moderate for cove hardwoods and northern hardwoods
Suitability: Suited
Management concerns: Equipment use and erodibility
Management measures and considerations:
- Using cable logging methods helps to minimize road and trail construction, especially in areas where slope exceeds 40 percent.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.

- When the soil is wet, skid trails and unsurfaced roads are highly erodible and very slick due to the silt and clay content of the subsoil.
- Avoiding logging operations during periods when the soil is saturated helps to prevent rutting of the soil surface and damage to tree roots due to soil compaction.
- Leaving a buffer zone of trees and shrubs adjacent to streams helps to minimize siltation and provides shade for the aquatic habitat.
- Livestock should not be allowed to graze in areas managed for woodland.

Urban Development

Dwellings

Suitability: Poorly suited
Management concerns: Slope, erodibility, and corrosivity
Management measures and considerations:
- Designing structures on the contour with the natural slope or building in less sloping areas helps to improve soil performance.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Using corrosion-resistant materials helps to reduce the risk of damage to concrete and uncoated steel.

Septic tank absorption fields

Suitability: Poorly suited
Management concerns: Slope and restricted permeability
Management measures and considerations:
- Contact the local Health Department for guidance on sanitary facilities.
- Installing distribution lines on the contour helps to improve the performance of septic tank absorption fields.
- Raking trench walls helps to prevent the sealing of soil pores which may occur during the excavation of septic tank absorption fields.

Local roads and streets

Suitability: Poorly suited
Management concerns: Slope, erodibility, and frost action
Management measures and considerations:
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Incorporating sand and gravel into the soil, compacting roadbeds, and designing roads that conform to natural slopes help to improve soil strength.
- The permanent surfacing of roads or the use of suitable subgrade or base material allows the year-round use of roads and helps to reduce the damage from frost heaving.

Lawns and landscaping

Suitability: Poorly suited
Management concerns: Slope, erodibility, soil fertility, climate, pesticide retention, and soil compaction
Management measures and considerations:
- Designing plantings on natural contours helps to increase water infiltration.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Avoiding the use of heavy equipment in areas to be landscaped helps to prevent soil compaction.

- Using lime, fertilizer, mulch, and irrigation helps to establish lawns and landscape plants.
- Because of the restricted movement of air and water due to the clay content of the subsoil, phytophthora root disease is a potential limitation for Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Topsoil should be stockpiled from disturbed areas and replaced before landscaping.
- The use of native, winter-hardy landscape plants is recommended.
- Because of the cooler air temperatures associated with the north- to east-facing aspects of this map unit, late spring frost may damage new growth in some years.
- This soil may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to landscape plants. Plant-applied pesticides may be more effetive than soil-applied pesticides.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- If excavated material is to be used for landscaping, any soft bedrock will need to be crushed or removed.

Interpretive Groups

Land capability classification: 6e

SbF—Snowbird loam, 50 to 95 percent slopes, stony

Setting

Landscape: Intermountain hills and low mountains throughout the county
Elevation range: 1,410 to 3,900 feet
Landform: North- to east-facing hillslopes and mountain slopes and those slopes shaded by the higher mountains
Landform position: Side slopes
Shape of areas: Irregular
Size of areas: Up to 184 acres

Map Unit Composition

Snowbird soil and similar inclusions: 80 percent
Dissimilar inclusions: 20 percent

Typical Profile

Surface layer:
0 to 3 inches—moderately decomposed plant material
3 to 10 inches—dark brown loam

Subsoil:
10 to 13 inches—dark brown loam
13 to 22 inches—brown sandy clay loam
22 to 34 inches—strong brown very fine sandy loam
34 to 57 inches—dark yellowish brown channery very fine sandy loam

Bedrock:
57 to 80 inches—weathered, interbedded metasandstone and phyllite

Soil Properties and Qualities

Depth class: Deep
Drainage class: Well drained
General texture class: Loamy
Permeability: Moderate
Available water capacity: Moderate or high
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Very steep
Soil slippage potential: Low
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: Widely scattered flagstones and stones that average about 6 to 24 inches in length and are about 25 to 75 feet apart
Organic matter content of surface layer: High or very high
Potential for frost action: Moderate
Special climatic conditions: Soil subject to cooler annual air temperatures, which allow late spring and early frosts; a higher soil moisture content due to north- to east-facing aspects and shading by the higher mountains
Soil reaction: Very strongly acid to moderately acid throughout the profile
Parent material: Residuum affected by soil creep in the upper part, weathered from low-grade metasedimentary rock
Depth to bedrock: 40 to 60 inches to soft bedrock
Other distinctive properties: Potential for downslope movement when lateral support is removed

Minor Components

Dissimilar inclusions:
- Random areas of Soco and Stecoah soils that have thinner surface layers with less organic matter, have less clay in the subsoil, and have soft bedrock at a depth of 20 to 60 inches; on south- to west-facing side slopes and spur ridges
- Santeetlah soils that have bedrock at a depth of more than 60 inches, on toeslopes, on benches, and in concave areas at the heads of drains
- Junaluska and Brasstown soils that have thinner surface layers with less organic matter, have redder subsoils, and have soft bedrock at a depth of 20 to 60 inches; on south- to west-facing side slopes and spur ridges
- Random areas of soils that have more mica in the subsoil and have bedrock at a depth of 20 to more than 60 inches
- Cheoah and Jeffrey soils that have less clay in the subsoil and have hard bedrock at a depth of 20 to 60 inches, adjacent to widely scattered rock outcrops
- Spivey soils that have more rock fragments in the subsoil and have bedrock at a depth of more than 60 inches, in drainageways and below rock outcrops
- Random areas of soils on slopes of less than 50 percent or more than 95 percent

Similar inclusions:
- Snowbird soils that have surface layers of sandy loam or fine sandy loam
- Random areas of similar soils that have a red subsoil

Land Use

Dominant Uses: Woodland and wildlife habitat

Agricultural Development

Cropland

Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope and erodibility. A site should be selected on better suited soils.

Pasture and hayland

Suitability: Unsuited
Management concerns:
- This map unit is severely limited for the production of pasture and hay crops because of the slope and erodibility. A site should be selected on better suited soils.

Orchard and ornamental crops

Suitability: Unsuited
Management concerns:
- This map unit is severely limited for orchard and ornamental crops because of the slope and erodibility. A site should be selected on better suited soils.

Woodland Management and Productivity

Potential for commercial species: Moderate for cove hardwoods and northern hardwoods
Suitability: Suited
Management concerns: Equipment use and erodibility
Management measures and considerations:
- Using cable logging methods helps to overcome the equipment limitation and prevents the acceleration of erosion caused by road construction, skid trails, and disturbance of the forest floor by heavy machinery.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.
- When the soil is wet, skid trails and unsurfaced roads are highly erodible and very slick due to the clay content of the subsoil.
- Avoiding logging operations during periods when the soil is saturated helps to prevent rutting of the soil surface and damage to tree roots due to soil compaction.
- Leaving a buffer zone of trees and shrubs adjacent to streams helps to minimize siltation and provides shade for the aquatic habitat.
- Livestock should not be allowed to graze in areas managed for woodland.

Urban Development

Dwellings

Suitability: Unsuited
Management concerns:
- This map unit is severely limited for dwellings because of the slope and erodibility. A site should be selected on better suited soils.

Septic tank absorption fields

Suitability: Unsuited
Management concerns:
- This map unit is severely limited for septic tank absorption fields because of the slope. Contact the local Health Department for additional guidance.

Local roads and streets
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for roads and streets because of the slope and erodibility. A site should be selected on better suited soils.

Lawns and landscaping
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for lawns and landscaping because of the slope and erodibility. A site should be selected on better suited soils.

Interpretive Groups

Land capability classification: 7e

ScD—Soco-Stecoah complex, 15 to 30 percent slopes, stony

Setting

Landscape: Intermediate mountains throughout the county
Elevation range: 2,060 to 4,640 feet
Landform: Ridges
Landform position: Summits and upper side slopes
Shape of areas: Long and narrow
Size of areas: Up to 112 acres

Map Unit Composition

Soco soil and similar inclusions: 50 percent
Stecoah soil and similar inclusions: 40 percent
Dissimilar inclusions: 10 percent

Typical Profile

Soco

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 3 inches—dark yellowish brown channery loam

Subsoil:
3 to 23 inches—brownish yellow channery sandy loam

Bedrock:
23 to 80 inches—weathered, interbedded metasandstone and phyllite

Stecoah

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 6 inches—dark brown channery loam

Subsoil:
6 to 13 inches—dark yellowish brown channery loam
13 to 37 inches—yellowish brown channery loam

Underlying material:
37 to 49 inches—channery loam saprolite multicolored in shades of brown and yellow

Bedrock:
49 to 80 inches—weathered, interbedded metasandstone and phyllite

Soil Properties and Qualities

Depth class: Soco—moderately deep; Stecoah—deep
Drainage class: Well drained
General texture class: Loamy
Permeability: Moderately rapid
Available water capacity: Low
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Moderately steep
Soil slippage potential: None
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: Widely scattered flagstones and stones that average about 6 to 24 inches in length and are about 25 to 75 feet apart
Organic matter content of surface layer: Low to high
Potential for frost action: Moderate
Soil reaction: Extremely acid to strongly acid throughout the profile
Parent material: Residuum weathered from low-grade metasedimentary rock
Depth to bedrock: Soco—20 to 40 inches to soft bedrock; Stecoah—40 to 60 inches to soft bedrock

Minor Components

Dissimilar inclusions:
- Random areas of Junaluska and Brasstown soils that have more clay in the subsoil and have soft bedrock at a depth of 20 to 60 inches
- Whiteoak soils that have thicker surface layers with more organic matter and have bedrock at a depth of more than 60 inches, in saddles and gaps and in concave areas at the head of drains
- Random areas of soils on slopes of less than 15 percent or more than 30 percent
- Widely scattered areas of rock outcrop
- Soils that have hard bedrock at a depth of less than 20 inches, adjacent to rock outcrops

Similar inclusions:
- Soco and Stecoah soils that have surface layers of fine sandy loam, sandy loam, or silt loam

Land Use

Dominant Uses: Woodland and wildlife habitat
Other Uses: Pasture, hayland, building site development, and recreation

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, and depth to bedrock. A site should be selected on better suited soils.

Pasture and hayland
Suitability: Suited

Management concerns: Soco—equipment use, erodibility, soil fertility, rooting depth, and droughtiness; Stecoah—equipment use, erodibility, soil fertility, and rooting depth

Management measures and considerations:

- The slope limits the use of equipment in the steeper areas.
- Growing adapted plants helps to ensure the production of high-quality forage and minimize soil erosion.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using rotational grazing, implementing a well planned harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.
- Because of the low available water capacity due to the moderately deep rooting depth, the Soco soil is difficult to manage for the production of pasture and hay crops.

Orchard and ornamental crops

Suitability: Poorly suited

Management concerns: Soco—equipment use, erodibility, soil fertility, ball and burlap harvesting, plant shape, rooting depth, and droughtiness; Stecoah—equipment use, erodibility, soil fertility, ball and burlap harvesting, plant shape, and rooting depth

Management measures and considerations:

- These soils may be difficult to manage for orchard or ornamental crops because the slope limits equipment use.
- Establishing and maintaining sod between rows and on access roads helps to reduce the hazard of erosion.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximize productivity.
- Avoiding ball and burlap harvesting during dry periods helps to prevent fracture of the ball and separation of the soil from the roots caused by a low moisture content and a minimal clay content.
- The slope affects the shape of ornamentals on the uphill side.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of the low available water capacity and windthrow hazard due to the moderately deep rooting depth, the Soco soil is difficult to manage for orchard and ornamental crops.

Woodland Management and Productivity

Potential for commercial species: Low for upland hardwoods and high for eastern white pine

Suitability: Suited

Management concerns: Soco—equipment use, erodibility, and windthrow hazard; Stecoah—equipment use and erodibility

Management measures and considerations:

- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.

- Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
- Leaving a buffer zone of trees and shrubs adjacent to streams helps to minimize siltation and provides shade for the aquatic habitat.
- Livestock should not be allowed to graze in areas managed for woodland.
- Productivity is limited by the limited rooting depth of the Soco soil.

Urban Development

Dwellings

Suitability: Poorly suited
Management concerns: Slope, erodibility, corrosivity, and depth to bedrock
Management measures and considerations:

- Designing structures on the contour with the natural slope or building in less sloping areas helps to improve soil performance.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
- Using corrosion-resistant materials helps to reduce the risk of damage to uncoated steel and concrete.
- The soft bedrock in these soils should not be difficult to excavate but will be difficult to vegetate and pack into a fill slope.

Septic tank absorption fields

Suitability: Poorly suited
Management concerns: Slope and depth to bedrock
Management measures and considerations:

- Contact the local Health Department for guidance on sanitary facilities.
- Installing distribution lines on the contour helps to improve the performance of septic tank absorption fields.
- Locating and using areas of the deeper Stecoah soil may improve the performance of filter fields.

Local roads and streets

Suitability: Poorly suited
Management concerns: Slope, low strength, erodibility, depth to bedrock, and frost action
Management measures and considerations:

- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
- Incorporating sand and gravel into the soil, compacting roadbeds, and designing roads that conform to natural slopes help to improve soil strength.
- The soft bedrock in these soils should not be difficult to excavate but will be difficult to vegetate and pack into a fill slope.
- The permanent surfacing of roads or the use of suitable subgrade or base material allows the year-round use of roads and helps to reduce the damage from frost heaving.

Lawns and landscaping

Suitability: Poorly suited

Management concerns: Soco—slope, erodibility, soil fertility, depth to bedrock, and droughtiness; Stecoah—slope, erodibility, soil fertility, and depth to bedrock

Management measures and considerations:
- Designing plantings on natural contours helps to increase water infiltration.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Topsoil should be stockpiled from disturbed areas and replaced before landscaping.
- Using lime, fertilizer, mulch, and irrigation helps to establish lawns and landscape plants.
- The use of native landscape plants that are tolerant of droughty, acidic soils is recommended.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of the moderately deep rooting depth, the Soco soil is difficult to manage for lawns and landscaping, especially if the soil has been disturbed.
- If excavated material is to be used for landscaping, any soft bedrock will need to be crushed or removed.

Interpretive Groups

Land capability classification: Soco—4s; Stecoah—4e

ScE—Soco-Stecoah complex, 30 to 50 percent slopes, stony

Setting

Landscape: Intermediate mountains throughout the county
Elevation range: 2,120 to 4,550 feet
Landform: Ridges and south- to west-facing mountain slopes
Landform position: Summits and side slopes
Shape of areas: Long and narrow on summits and irregular on side slopes
Size of areas: Up to 142 acres

Map Unit Composition

Soco soil and similar inclusions: 45 percent
Stecoah soil and similar inclusions: 35 percent
Dissimilar inclusions: 20 percent

Typical Profile

Soco

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 3 inches—dark yellowish brown channery loam

Subsoil:
3 to 23 inches—brownish yellow channery sandy loam

Bedrock:
23 to 80 inches—weathered, interbedded metasandstone and phyllite

Stecoah

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 6 inches—dark brown channery loam

Subsoil:
6 to 13 inches—dark yellowish brown channery loam
13 to 37 inches—yellowish brown channery loam

Underlying material:
37 to 49 inches—channery loam saprolite multicolored in shades of brown and yellow

Bedrock:
49 to 80 inches—weathered, interbedded metasandstone and phyllite

Soil Properties and Qualities

Depth class: Soco—moderately deep; Stecoah—deep
Drainage class: Well drained
General texture class: Loamy
Permeability: Moderately rapid
Available water capacity: Low
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Steep
Soil slippage potential: Low
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: Widely scattered flagstones and stones that average about 6 to 24 inches in length and are about 25 to 75 feet apart
Organic matter content of surface layer: Low to high
Potential for frost action: Moderate
Soil reaction: Extremely acid to strongly acid throughout the profile
Parent material: Residuum affected by soil creep in the upper part, weathered from low-grade metasedimentary rock
Depth to bedrock: Soco—20 to 40 inches to soft bedrock; Stecoah—40 to 60 inches to soft bedrock
Other distinctive properties: Potential for downslope movement when lateral support is removed

Minor Components

Dissimilar inclusions:
- Random areas of Junaluska and Brasstown soils that have more clay in the subsoil and have soft bedrock at a depth of 20 to 60 inches
- Lonon soils that have more clay in the subsoil and have bedrock at a depth of more than 60 inches, on benches, on footslopes, and in concave areas at the head of drains
- Northcove soils that have more rock fragments in the subsoil and have bedrock at a depth of more than 60 inches, in drainageways and below rock outcrops
- Santeetlah soils that have thicker surface layers with more organic matter and have bedrock at a depth of more than 60 inches, on toeslopes, on benches, and in concave areas at the heads of drains

- Spivey soils that have thicker surface layers with more organic matter and have bedrock at a depth of more than 60 inches, in drainageways and below rock outcrops
- Cheoah and Jeffrey soils that have thicker surface layers with more organic matter, on north- to east-facing side slopes
- Widely scattered areas of rock outcrop
- Soils that have hard bedrock at a depth of less than 20 inches, adjacent to rock outcrops
- Random areas of soils on slopes of less than 30 percent or more than 50 percent

Similar inclusions:
- Soco and Stecoah soils that have surface layers of fine sandy loam, sandy loam, or silt loam

Land Use

Dominant Uses: Woodland and wildlife habitat
Other Uses: Pasture, building site development, and recreation

Agricultural Development

Cropland

Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, and depth to bedrock. A site should be selected on better suited soils.

Pasture and hayland

Suitability: Pasture—poorly suited; hayland—unsuited
Management concerns: Soco—equipment use, erodibility, soil fertility, rooting depth, and droughtiness; Stecoah—equipment use, erodibility, soil fertility, and rooting depth
Management measures and considerations:
- Because of the slope, this map unit is difficult to manage for pasture and hayland.
- Growing adapted plants helps to ensure the production of high-quality forage and minimize soil erosion.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using rotational grazing and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.
- Because of the low available water capacity due to the moderately deep rooting depth, the Soco soil is difficult to manage for the production of pasture and hay crops.

Orchard and ornamental crops

Suitability: Poorly suited
Management concerns: Soco—equipment use, erodibility, soil fertility, ball and burlap harvesting, plant shape, rooting depth, and droughtiness; Stecoah—equipment use, erodibility, soil fertility, ball and burlap harvesting, plant shape, and rooting depth
Management measures and considerations:
- These soils may be difficult to manage for orchard or ornamental crops because the slope limits equipment use.
- Establishing and maintaining sod between rows and on access roads helps to reduce the hazard of erosion.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximize productivity.

- Avoiding ball and burlap harvesting during dry periods helps to prevent fracture of the ball and separation of the soil from the roots caused by a low moisture content and a minimal clay content.
- The slope affects the shape of ornamentals on the uphill side.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of the low available water capacity and windthrow hazard due to the moderately deep rooting depth, the Soco soil is difficult to manage for orchard and ornamental crops.

Woodland Management and Productivity

Potential for commercial species: Low for upland hardwoods and high for eastern white pine
Suitability: Suited
Management concerns: Soco—equipment use, erodibility, and windthrow hazard; Steocah—equipment use and erodibility
Management measures and considerations:
- Using cable logging methods helps to minimize road and trail construction, especially in areas where slope exceeds 40 percent.
- The underlying bedrock may be susceptible to mass movement. An onsite investigation is needed to determine the suitability and limitations of any area within this map unit for access roads.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.
- Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
- Leaving a buffer zone of trees and shrubs adjacent to streams helps to minimize siltation and provides shade for the aquatic habitat.
- Livestock should not be allowed to graze in areas managed for woodland.
- Productivity is limited by the limited rooting depth of the Soco soil.

Urban Development

Dwellings

Suitability: Poorly suited
Management concerns: Slope, erodibility, corrosivity, and depth to bedrock
Management measures and considerations:
- Designing structures on the contour with the natural slope or building in less sloping areas helps to improve soil performance.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
- Using corrosion-resistant materials helps to reduce the risk of damage to uncoated steel and concrete.
- The soft bedrock in these soils should not be difficult to excavate but will be difficult to vegetate and pack into a fill slope.

Septic tank absorption fields
Suitability: Poorly suited
Management concerns: Slope and depth to bedrock
Management measures and considerations:
- Contact the local Health Department for guidance on sanitary facilities.
- Installing distribution lines on the contour helps to improve the performance of septic tank absorption fields.
- Locating and using areas of the deeper Stecoah soil may improve the performance of filter fields.

Local roads and streets
Suitability: Poorly suited
Management concerns: Slope, erodibility, slippage, differential settling, depth to bedrock, low strength, and frost action
Management measures and considerations:
- The underlying bedrock may be susceptible to mass movement. An onsite investigation is needed to determine the suitability and limitations of any area within this map unit.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
- The soft bedrock in these soils should not be difficult to excavate but will be difficult to vegetate and pack into a fill slope.
- These soils are subject to uneven settling and may be unstable if not properly compacted.
- Incorporating sand and gravel into the soil, compacting roadbeds, and designing roads that conform to natural slopes help to improve soil strength.
- The permanent surfacing of roads or the use of suitable subgrade or base material allows the year-round use of roads and helps to reduce the damage from frost heaving.

Lawns and landscaping
Suitability: Poorly suited
Management concerns: Soco—slope, erodibility, droughtiness, soil fertility, and depth to bedrock; Stecoah—slope, erodibility, droughtiness, and soil fertility
Management measures and considerations:
- Designing plantings on natural contours helps to increase water infiltration.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Topsoil should be stockpiled from disturbed areas and replaced before landscaping.
- Using lime, fertilizer, mulch, and irrigation helps to establish lawns and landscape plants.
- The use of native landscape plants that are tolerant of droughty, acidic soils is recommended.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of the moderately deep rooting depth, the Soco soil is difficult to manage for lawns and landscaping, especially if the soil has been disturbed.
- If excavated material is to be used for landscaping, any soft bedrock will need to be crushed or removed.

Interpretive Groups

Land capability classification: Soco—6s; Stecoah—6e

ScF—Soco-Stecoah complex, 50 to 95 percent slopes, stony

Setting

Landscape: Intermediate mountains throughout the county
Elevation range: 1,480 to 4,500 feet
Landform: South- to west-facing mountain slopes
Landform position: Side slopes
Shape of areas: Irregular
Size of areas: Up to 259 acres

Map Unit Composition

Soco soil and similar inclusions: 45 percent
Stecoah soil and similar inclusions: 35 percent
Dissimilar inclusions: 20 percent

Typical Profile

Soco

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 3 inches—dark yellowish brown channery loam

Subsoil:
3 to 23 inches—brownish yellow channery sandy loam

Bedrock:
23 to 80 inches—weathered, interbedded metasandstone and phyllite

Stecoah

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 6 inches—dark brown channery loam

Subsoil:
6 to 13 inches—dark yellowish brown channery loam
13 to 37 inches—yellowish brown channery loam

Underlying material:
37 to 49 inches—channery loam saprolite multicolored in shades of brown and yellow

Bedrock:
49 to 80 inches—weathered, interbedded metasandstone and phyllite

Soil Properties and Qualities

Depth class: Soco—moderately deep; Stecoah—deep
Drainage class: Well drained
General texture class: Loamy
Permeability: Moderately rapid
Available water capacity: Low
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None

Shrink-swell potential: Low
Slope class: Very steep
Soil slippage potential: Medium
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: Widely scattered flagstones and stones that average about 6 to 24 inches in length and are about 25 to 75 feet apart
Organic matter content of surface layer: Low to high
Potential for frost action: Moderate
Soil reaction: Extremely acid to strongly acid throughout the profile
Parent material: Residuum affected by soil creep in the upper part, weathered from low-grade metasedimentary rock
Depth to bedrock: Soco—20 to 40 inches to soft bedrock; Stecoah—40 to 60 inches to soft bedrock
Other distinctive properties: Soils subject to downslope movement when lateral support is removed

Minor Components

Dissimilar inclusions:

- Santeetlah soils that have thicker surface layers with more organic matter and have bedrock at a depth of more than 60 inches, on benches, on footslopes, and in concave areas at the head of drains
- Spivey soils that have thicker surface layers with more organic matter and have bedrock at a depth of more than 60 inches, in drainageways and below rock outcrops
- Northcove soils that have more rock fragments in the subsoil, in drainageways and below rock outcrops
- Cheoah and Jeffrey soils that have thicker surface layers with more organic matter, on north- to east-facing side slopes
- Ditney soils that have less clay in the subsoil and have hard bedrock at a depth of 20 to 40 inches, on spur ridges
- Widely scattered areas of rock outcrop
- Random areas of soils on slopes of less than 50 percent or more than 95 percent

Similar inclusions:

- Soco and Stecoah soils that have surface layers of fine sandy loam, sandy loam, or silt loam

Land Use

Dominant Uses: Woodland and wildlife habitat

Agricultural Development

Cropland

Suitability: Unsuited
Management concerns:

- This map unit is severely limited for crop production because of the slope, erodibility, and depth to bedrock. A site should be selected on better suited soils.

Pasture and hayland

Suitability: Unsuited
Management concerns:

- This map unit is severely limited for the production of pasture and hay crops because of the slope, erodibility, and depth to bedrock. A site should be selected on better suited soils.

Orchard and ornamental crops
Suitability: Unsuited
Management concerns:
• This map unit is severely limited for orchard and ornamental crops because of the slope, erodibility, and depth to bedrock. A site should be selected on better suited soils.

Woodland Management and Productivity

Potential for commercial species: Low for hardwoods and high for eastern white pine
Suitability: Poorly suited
Management concerns: Soco—equipment use, erodibility, and windthrow hazard; Stecoah—equipment use and erodibility
Management measures and considerations:
• Using cable logging methods helps to overcome the equipment limitation and prevents the acceleration of erosion caused by road construction, skid trails, and disturbance of the forest floor by heavy machinery.
• Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
• Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
• Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.
• The underlying bedrock may be susceptible to mass movement. An onsite investigation is needed to determine the suitability and limitations of any area within this map unit for access roads.
• Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
• Avoiding logging operations during periods when the soil is saturated helps to prevent rutting of the soil surface and damage to tree roots due to soil compaction.
• Leaving a buffer zone of trees and shrubs adjacent to streams helps to minimize siltation and provides shade for the aquatic habitat.
• Livestock should not be allowed to graze in areas managed for woodland.
• Productivity is limited by the limited rooting depth of the Soco soil.

Urban Development

Dwellings
Suitability: Unsuited
Management concerns:
• This map unit is severely limited for dwellings because of the slope, erodibility, and depth to bedrock. A site should be selected on better suited soils.

Septic tank absorption fields
Suitability: Unsuited
Management concerns:
• This map unit is severely limited for septic tank absorption fields because of the slope and depth to bedrock. Contact the local Health Department for additional guidance.

Local roads and streets
Suitability: Unsuited
Management concerns:
• This map unit is severely limited for roads and streets because of the slope, erodibility, and depth to bedrock. A site should be selected on better suited soils.

Lawns and landscaping
Suitability: Unsuited

Management concerns:

- This map unit is severely limited for lawns and landscaping because of the slope and depth to bedrock. A site should be selected on better suited soils.

Interpretive Groups

Land capability classification: Soco—7s; Stecoah—7e

SdD—Soco-Stecoah complex, 15 to 30 percent slopes, rocky

Setting

Landscape: Intermediate mountains throughout the county
Elevation range: 1,700 to 4,680 feet
Landform: Ridges
Landform position: Summits and upper side slopes
Shape of areas: Long and narrow
Size of areas: Up to 229 acres

Map Unit Composition

Soco soil and similar inclusions: 50 percent
Stecoah soil and similar inclusions: 35 percent
Rock outcrop: 2 percent
Dissimilar inclusions: 13 percent

Typical Profile

Soco

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 3 inches—dark yellowish brown channery loam

Subsoil:
3 to 23 inches—brownish yellow channery sandy loam

Bedrock:
23 to 80 inches—weathered, interbedded metasandstone and phyllite

Stecoah

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 6 inches—dark brown channery loam

Subsoil:
6 to 13 inches—dark yellowish brown channery loam
13 to 37 inches—yellowish brown channery loam

Underlying material:
37 to 49 inches—channery loam saprolite multicolored in shades of brown and yellow

Bedrock:
49 to 80 inches—weathered, interbedded metasandstone and phyllite

Soil Properties and Qualities

Depth class: Soco—moderately deep; Stecoah—deep
Drainage class: Well drained
General texture class: Loamy

Permeability: Moderately rapid
Available water capacity: Low
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Moderately steep
Soil slippage potential: None
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: Widely scattered flagstones and stones that average about 6 to 24 inches in length and are about 25 to 75 feet apart
Extent of Rock outcrop: About 2 percent of the soil surface
Organic matter content of surface layer: Low to high
Potential for frost action: Moderate
Soil reaction: Extremely acid to strongly acid throughout the profile
Parent material: Residuum weathered from low-grade metasedimentary rock
Depth to bedrock: Soco—20 to 40 inches to soft bedrock; Stecoah—40 to 60 inches to soft bedrock

Minor Components

Dissimilar inclusions:
- Random areas of Junaluska and Brasstown soils that have more clay in the subsoil and have soft bedrock at a depth of 20 to 60 inches
- Whiteoak soils that have thicker surface layers with more organic matter and have bedrock at a depth of more than 60 inches, in saddles and gaps and in concave areas at the head of drains
- Ditney and Unicoi soils that have hard bedrock at a depth of 7 to 40 inches, on south- to west-facing shoulder slopes and nose slopes
- Random areas of soils on slopes of less than 15 percent or more than 30 percent
- Soils that have hard bedrock at a depth of less than 20 inches, adjacent to rock outcrops
- Prominent ridges and upper side slopes that are subject to frequent rime ice in winter and high winds year-round

Similar inclusions:
- Soco and Stecoah soils that have surface layers of fine sandy loam, sandy loam, or silt loam

Land Use

Dominant Uses: Woodland and wildlife habitat
Other Uses: Recreation, pasture, and building site development

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, and depth to bedrock. A site should be selected on better suited soils.

Pasture and hayland
Suitability: Suited
Management concerns: Soco—equipment use, erodibility, soil fertility, rooting depth, and droughtiness; Stecoah—equipment use, erodibility, soil fertility, and rooting depth

Management measures and considerations:
- The slope limits the use of equipment in the steeper areas.
- Growing adapted plants helps to ensure the production of high-quality forage and minimize soil erosion.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using rotational grazing, implementing a well planned harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.
- Because of the low available water capacity due to the moderately deep rooting depth, the Soco soil is difficult to manage for the production of pasture and hay crops.

Orchard and ornamental crops

Suitability: Poorly suited

Management concerns: Soco—equipment use, erodibility, soil fertility, ball and burlap harvesting, plant shape, rooting depth, and droughtiness; Stecoah—equipment use, erodibility, soil fertility, ball and burlap harvesting, plant shape, and rooting depth

Management measures and considerations:
- These soils may be difficult to manage for orchard or ornamental crops because the slope limits equipment use.
- Establishing and maintaining sod between rows and on access roads helps to reduce the hazard of erosion.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximize productivity.
- Avoiding ball and burlap harvesting during dry periods helps to prevent fracture of the ball and separation of the soil from the roots caused by a low moisture content and a minimal clay content.
- The slope affects the shape of ornamentals on the uphill side.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of the low available water capacity and windthrow hazard due to the moderately deep rooting depth, the Soco soil is difficult to manage for orchard and ornamental crops.

Woodland Management and Productivity

Potential for commercial species: Low for upland hardwoods and high for eastern white pine

Suitability: Suited

Management concerns: Soco—equipment use, erodibility, and windthrow hazard; Stecoah—equipment use and erodibility

Management measures and considerations:
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.
- Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
- Blasting, shaping, and grading are needed if roads are to be constructed on the contour.

- Leaving a buffer zone of trees and shrubs adjacent to streams helps to minimize siltation and provides shade for the aquatic habitat.
- Livestock should not be allowed to graze in areas managed for woodland.
- Productivity is limited by the limited rooting depth of the Soco soil.

Urban Development

Dwellings

Suitability: Poorly suited
Management concerns: Slope, erodibility, corrosivity, and depth to bedrock
Management measures and considerations:
- Designing structures on the contour with the natural slope or building in less sloping areas helps to improve soil performance.
- Drilling and blasting of rock or special earth-moving equipment is needed to increase the depth of these soils.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
- Using corrosion-resistant materials helps to reduce the risk of damage to uncoated steel and concrete.
- The soft bedrock in these soils should not be difficult to excavate but will be difficult to vegetate and pack into a fill slope.

Septic tank absorption fields

Suitability: Poorly suited
Management concerns: Slope and depth to bedrock
Management measures and considerations:
- Contact the local Health Department for guidance on sanitary facilities.
- Installing distribution lines on the contour helps to improve the performance of septic tank absorption fields.
- Locating and using areas of the deeper Stecoah soil may improve the performance of filter fields.

Local roads and streets

Suitability: Poorly suited
Management concerns: Slope, low strength, erodibility, depth to bedrock, and frost action
Management measures and considerations:
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
- Incorporating sand and gravel into the soil, compacting roadbeds, and designing roads that conform to natural slopes help to improve soil strength.
- The soft bedrock in these soils should not be difficult to excavate but will be difficult to vegetate and pack into a fill slope.
- Blasting, shaping, and grading are needed if roads are to be constructed on the contour.
- The permanent surfacing of roads or the use of suitable subgrade or base material allows the year-round use of roads and helps to reduce the damage from frost heaving.

Lawns and landscaping
Suitability: Poorly suited
Management concerns: Soco—slope, erodibility, soil fertility, depth to bedrock, and droughtiness; Stecoah—slope, erodibility, soil fertility, and depth to bedrock
Management measures and considerations:
- Designing plantings on natural contours helps to increase water infiltration.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Topsoil should be stockpiled from disturbed areas and replaced before landscaping.
- Using lime, fertilizer, mulch, and irrigation helps to establish lawns and landscape plants.
- The use of native landscape plants that are tolerant of droughty, acidic soils is recommended.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of the moderately deep rooting depth, the Soco soil is difficult to manage for lawns and landscaping, especially if the soil has been disturbed.
- If excavated material is to be used for landscaping, any soft bedrock will need to be crushed or removed.

Interpretive Groups

Land capability classification: Soco—4s; Stecoah—6e

SdE—Soco-Stecoah complex, 30 to 50 percent slopes, rocky

Setting

Landscape: Intermediate mountains throughout the county
Elevation range: 1,660 to 4,720 feet
Landform: Ridges and south- to west-facing mountain slopes
Landform position: Summits and side slopes
Shape of areas: Long and narrow on summits and irregular on side slopes
Size of areas: Up to 131 acres

Map Unit Composition

Soco soil and similar inclusions: 45 percent
Stecoah soil and similar inclusions: 35 percent
Rock outcrop: 2 percent
Dissimilar inclusions: 18 percent

Typical Profile

Soco

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 3 inches—dark yellowish brown channery loam

Subsoil:
3 to 23 inches—brownish yellow channery sandy loam

Bedrock:
23 to 80 inches—weathered, interbedded metasandstone and phyllite

Stecoah

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 6 inches—dark brown channery loam

Subsoil:
6 to 13 inches—dark yellowish brown channery loam
13 to 37 inches—yellowish brown channery loam

Underlying material:
37 to 49 inches—channery loam saprolite multicolored in shades of brown and yellow

Bedrock:
49 to 80 inches—weathered, interbedded metasandstone and phyllite

Soil Properties and Qualities

Depth class: Soco—moderately deep; Stecoah—deep
Drainage class: Well drained
General texture class: Loamy
Permeability: Moderately rapid
Available water capacity: Low
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Steep
Soil slippage potential: Low
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: Widely scattered flagstones and stones that average about 6 to 24 inches in length and are about 25 to 75 feet apart
Extent of Rock outcrop: About 2 percent of the soil surface
Organic matter content of surface layer: Low to high
Potential for frost action: Moderate
Soil reaction: Extremely acid to strongly acid throughout the profile
Parent material: Residuum affected by soil creep in the upper part, weathered from low-grade metasedimentary rock
Depth to bedrock: Soco—20 to 40 inches to soft bedrock; Stecoah—40 to 60 inches to soft bedrock
Other distinctive properties: Potential for downslope movement when lateral support is removed

Minor Components

Dissimilar inclusions:
- Random areas of Junaluska and Brasstown soils that have more clay in the subsoil and have soft bedrock at a depth of 20 to 60 inches
- Lonon soils that have more clay in the subsoil and have bedrock at a depth of more than 60 inches, on benches, on footslopes, and in concave areas at the head of drains
- Northcove soils that have more rock fragments in the subsoil and have bedrock at a depth of more than 60 inches, in drainageways and below rock outcrops
- Santeetlah soils that have thicker surface layers with more organic matter and have bedrock at a depth of more than 60 inches, on toeslopes, on benches, and in concave areas at the heads of drains

- Spivey soils that have thicker surface layers with more organic matter and have bedrock at a depth of more than 60 inches, in drainageways and below rock outcrops
- Ditney and Unicoi soils that have thinner surface layers with less organic matter and have hard bedrock at a depth of 7 to 40 inches, on south- to west-facing shoulder slopes and nose slopes
- Cheoah and Jeffrey soils that have thicker surface layers with more organic matter, on north- to east-facing side slopes
- Random areas of Junaluska and Brasstown soils that have more clay in the subsoil and have soft bedrock at a depth of 20 to 60 inches
- Soils that have hard bedrock at a depth of less than 20 inches, adjacent to rock outcrops
- Random areas of soils on slopes of less than 30 percent or more than 50 percent

Similar inclusions:
- Soco and Stecoah soils that have surface layers of fine sandy loam, sandy loam, or silt loam

Land Use

Dominant Uses: Woodland and wildlife habitat
Other Uses: Pasture, building site development, and recreation

Agricultural Development

Cropland

Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, and depth to bedrock. A site should be selected on better suited soils.

Pasture and hayland

Suitability: Pasture—poorly suited; hayland—unsuited
Management concerns: Soco—equipment use, erodibility, soil fertility, rooting depth, and droughtiness; Stecoah—equipment use, erodibility, soil fertility, and rooting depth
Management measures and considerations:
- Because of the slope, this map unit is difficult to manage for pasture and hayland.
- Growing adapted plants helps to ensure the production of high-quality forage and minimize soil erosion.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using rotational grazing, implementing a well planned harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.
- Because of the low available water capacity due to the moderately deep rooting depth, the Soco soil is difficult to manage for the production of pasture and hay crops.

Orchard and ornamental crops

Suitability: Poorly suited
Management concerns: Soco—equipment use, erodibility, soil fertility, ball and burlap harvesting, plant shape, rooting depth, and droughtiness; Stecoah—equipment use, erodibility, soil fertility, ball and burlap harvesting, plant shape, and rooting depth

Management measures and considerations:
- These soils may be difficult to manage for orchard or ornamental crops because the slope limits equipment use.
- Establishing and maintaining sod between rows and on access roads helps to reduce the hazard of erosion.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximize productivity.
- Avoiding ball and burlap harvesting during dry periods helps to prevent fracture of the ball and separation of the soil from the roots caused by a low moisture content and a minimal clay content.
- The slope affects the shape of ornamentals on the uphill side.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of the low available water capacity and windthrow hazard due to the moderately deep rooting depth, the Soco soil is difficult to manage for orchard and ornamental crops.

Woodland Management and Productivity

Potential for commercial species: Low for upland hardwoods and high for eastern white pine
Suitability: Suited
Management concerns: Soco—equipment use, erodibility, and windthrow hazard; Stecoah—equipment use and erodibility
Management measures and considerations:
- Using cable logging methods helps to minimize road and trail construction, especially in areas where slope exceeds 40 percent.
- Leaving a buffer zone of trees and shrubs adjacent to streams helps to minimize siltation and provides shade for the aquatic habitat.
- The underlying bedrock may be susceptible to mass movement. An onsite investigation is needed to determine the suitability and limitations of any area within this map unit for access roads.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.
- Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
- Livestock should not be allowed to graze in areas managed for woodland.
- Productivity is limited by the limited rooting depth of the Soco soil.

Urban Development

Dwellings
Suitability: Poorly suited
Management concerns:
- This map unit is severely limited for dwellings because of the slope, erodibility, depth to bedrock, and stony surface. A site should be selected on better suited soils.

Septic tank absorption fields
Suitability: Unsuited

Management concerns:
- This map unit is severely limited for septic tank absorption fields because of the slope, depth to bedrock, and stony surface. Contact the local Health Department for additional guidance.

Local roads and streets
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for roads and streets because of the slope, erodibility, depth to bedrock, and stony surface. A site should be selected on better suited soils.

Lawns and landscaping
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for lawns and landscaping because of the slope, erodibility, depth to bedrock, and stony surface. A site should be selected on better suited soils.

Interpretive Groups

Land capability classification: Soco—6s; Stecoah—6e

SdF—Soco-Stecoah complex, 50 to 95 percent slopes, rocky

Setting

Landscape: Intermediate mountains throughout the county
Elevation range: 1,100 to 4,740 feet
Landform: South- to west-facing mountain slopes
Landform position: Side slopes
Shape of areas: Irregular
Size of areas: Up to 362 acres

Map Unit Composition

Soco soil and similar inclusions: 45 percent
Stecoah soil and similar inclusions: 35 percent
Rock outcrop: 2 percent
Dissimilar inclusions: 18 percent

Typical Profile

Soco

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 3 inches—dark yellowish brown channery loam

Subsoil:
3 to 23 inches—brownish yellow channery sandy loam

Bedrock:
23 to 80 inches—weathered, interbedded metasandstone and phyllite

Stecoah

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 6 inches—dark brown channery loam

Subsoil:
6 to 13 inches—dark yellowish brown channery loam
13 to 37 inches—yellowish brown channery loam

Underlying material:
37 to 49 inches—channery loam saprolite multicolored in shades of brown and yellow

Bedrock:
49 to 80 inches—weathered, interbedded metasandstone and phyllite

Soil Properties and Qualities

Depth class: Soco—moderately deep; Stecoah—deep
Drainage class: Well drained
General texture class: Loamy
Permeability: Moderately rapid
Available water capacity: Low
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Very steep
Soil slippage potential: Medium
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: Widely scattered flagstones and stones that average about 6 to 24 inches in length and are about 25 to 75 feet apart
Extent of Rock outcrop: About 2 percent of the soil surface
Organic matter content of surface layer: Low to high
Potential for frost action: Moderate
Soil reaction: Extremely acid to strongly acid throughout the profile
Parent material: Residuum affected by soil creep in the upper part, weathered from low-grade metasedimentary rock
Depth to bedrock: Soco—20 to 40 inches to soft bedrock; Stecoah—40 to 60 inches to soft bedrock
Other distinctive properties: Soils subject to downslope movement when lateral support is removed

Minor Components

Dissimilar inclusions:
- Spivey soils that have more rock fragments in the subsoil and have bedrock at a depth of more than 60 inches, in drainageways and below rock outcrops
- Santeetlah soils that have bedrock at a depth of more than 60 inches, in concave areas at the head of drains and on footslopes
- Northcove soils that have more rock fragments in the subsoil, in drainageways and below rock outcrops
- Cheoah and Jeffrey soils that have thicker surface layers with more organic matter, on north- to east-facing side slopes
- Ditney and Unicoi soils that have hard bedrock at a depth of 7 to 40 inches, on south- to west-facing shoulder slopes and nose slopes

- Soils that have hard bedrock at a depth of less than 20 inches, adjacent to rock outcrops
- Random areas of soils on slopes of less than 50 percent or more than 95 percent
- Random areas where landslides have occurred

Similar inclusions:
- Soco and Stecoah soils that have surface layers of fine sandy loam, sandy loam, or silt loam

Land Use

Dominant Uses: Woodland and wildlife habitat

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, and depth to bedrock. A site should be selected on better suited soils.

Pasture and hayland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for the production of pasture and hay crops because of the slope, erodibility, and depth to bedrock. A site should be selected on better suited soils.

Orchard and ornamental crops
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for orchard and ornamental crops because of the slope, erodibility, and depth to bedrock. A site should be selected on better suited soils.

Woodland Management and Productivity

Potential for commercial species: Low for hardwoods and high for eastern white pine
Suitability: Poorly suited
Management concerns: Soco—equipment use, erodibility, and windthrow hazard; Stecooah—equipment use and erodibility
Management measures and considerations:
- Using cable logging methods helps to overcome the equipment limitation and prevents the acceleration of erosion caused by road construction, skid trails, and disturbance of the forest floor by heavy machinery.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.
- The underlying bedrock may be susceptible to mass movement. An onsite investigation is needed to determine the suitability and limitations of any area within this map unit for access roads.
- Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
- Avoiding logging operations during periods when the soil is saturated helps to prevent rutting of the soil surface and damage to tree roots due to soil compaction.

- Leaving a buffer zone of trees and shrubs adjacent to streams helps to minimize siltation and provides shade for the aquatic habitat.
- Livestock should not be allowed to graze in areas managed for woodland.
- Productivity is limited by the limited rooting depth of the Soco soil.

Urban Development

Dwellings
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for dwellings because of the slope, erodibility, and depth to bedrock. A site should be selected on better suited soils.

Septic tank absorption fields
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for septic tank absorption fields because of the slope and depth to bedrock. Contact the local Health Department for additional guidance.

Local roads and streets
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for roads and streets because of the slope, erodibility, and depth to bedrock. A site should be selected on better suited soils.

Lawns and landscaping
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for lawns and landscaping because of the slope and depth to bedrock. A site should be selected on better suited soils.

Interpretive Groups

Land capability classification: 7s

SnD—Soco-Stecoah complex, windswept, 15 to 30 percent slopes, stony

Setting

Landscape: Intermediate mountains, dominantly near the Cherokee County line in the southern part of the county
Elevation range: 3,390 to 4,800 feet
Landform: Ridges
Landform position: Summits and upper side slopes
Shape of areas: Long and narrow
Size of areas: Up to 55 acres

Map Unit Composition

Soco soil and similar inclusions: 50 percent
Stecoah soil and similar inclusions: 40 percent
Dissimilar inclusions: 10 percent

Typical Profile

Soco

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 3 inches—dark yellowish brown channery loam

Subsoil:
3 to 23 inches—brownish yellow channery sandy loam

Bedrock:
23 to 80 inches—weathered, interbedded metasandstone and phyllite

Stecoah

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 6 inches—dark brown channery loam

Subsoil:
6 to 13 inches—dark yellowish brown channery loam
13 to 37 inches—yellowish brown channery loam

Underlying material:
37 to 49 inches—channery loam saprolite multicolored in shades of brown and yellow

Bedrock:
49 to 80 inches—weathered, interbedded metasandstone and phyllite

Soil Properties and Qualities

Depth class: Soco—moderately deep; Stecoah—deep
Drainage class: Well drained
General texture class: Loamy
Permeability: Moderately rapid
Available water capacity: Low
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Moderately steep
Soil slippage potential: None
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: Widely scattered flagstones and stones that average about 6 to 24 inches in length and are about 25 to 75 feet apart
Organic matter content of surface layer: Low to high
Potential for frost action: Moderate
Soil reaction: Extremely acid to strongly acid throughout the profile
Special climatic conditions: Soils subject to damaging high winds
Parent material: Residuum weathered from low-grade metasedimentary rock
Depth to bedrock: Soco—20 to 40 inches to soft bedrock; Stecoah—40 to 60 inches to soft bedrock

Minor Components

Dissimilar inclusions:

- Random areas of Junaluska and Brasstown soils that have more clay in the subsoil and have soft bedrock at a depth of 20 to 60 inches

- Whiteoak soils that have thicker surface layers with more organic matter and have bedrock at a depth of more than 60 inches, in saddles and gaps and in concave areas at the head of drains
- Random areas of soils on slopes of less than 15 percent or more than 30 percent
- Soils that have hard bedrock at a depth of less than 20 inches, adjacent to rock outcrops
- Widely scattered areas of rock outcrop

Similar inclusions:
- Soco and Stecoah soils that have surface layers of fine sandy loam, sandy loam, or silt loam

Land Use

Dominant Uses: Woodland and wildlife habitat
Other Uses: Pasture, hayland, building site development, and recreation

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns: Soco—climate, equipment use, erodibility, soil fertility, rooting depth, and droughtiness; Stecoah—climate, equipment use, erodibility, soil fertility, and rooting depth
Management measures and considerations:
- These soils are difficult to manage for cultivated crops because of the damaging high winds and the slope which limits equipment use. A site should be selected on better suited soils.

Pasture and hayland
Suitability: Poorly suited
Management concerns: Soco—climate, equipment use, erodibility, soil fertility, rooting depth, and droughtiness; Stecoah—climate, equipment use, erodibility, soil fertility, and rooting depth
Management measures and considerations:
- These soils are difficult to manage for pasture and hayland because of the damaging high winds.
- The slope limits the use of equipment in the steeper areas.
- Preparing seedbeds on the contour or across the slope helps to minimize soil erosion and increases germination.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using rotational grazing, implementing a well planned clipping and harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.
- Because of the low available water capacity due to the moderately deep rooting depth, the Soco soil is difficult to manage for the production of pasture and hay crops.
- Using drought-tolerant plants helps to increase productivity.

Orchard and ornamental crops
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for orchard and ornamental crops because of the damaging high winds, slope, erodibility, and the depth to bedrock and droughtiness in areas of the Soco soil. A site should be selected on better suited soils.

Woodland Management and Productivity

Potential for commercial species: Very low
Management concerns:
- This map unit is severely limited for timber production because of the damaging high winds, low productivity, and the depth to bedrock in the Soco soil. A site should be selected on better suited soils.

Urban Development

Dwellings
Suitability: Poorly suited
Management concerns: Soco—slope, erodibility, climate, corrosivity, and depth to bedrock; Stecoah—slope, erodibility, climate, and corrosivity
Management measures and considerations:
- Designing structures on the contour with the natural slope or building in less sloping areas helps to improve soil performance.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
- Design modifications are needed to overcome the effects of damaging high winds.
- Using corrosion-resistant materials helps to reduce the risk of damage to uncoated steel and concrete, foundations, and basements.
- The soft bedrock in these soils should not be difficult to excavate but will be difficult to vegetate and pack into a fill slope.

Septic tank absorption fields
Suitability: Poorly suited
Management concerns: Slope and depth to bedrock
Management measures and considerations:
- Contact the local Health Department for guidance on sanitary facilities.
- Installing distribution lines on the contour helps to improve the performance of septic tank absorption fields.
- Locating and using areas of the deeper Stecoah soil may improve the performance of filter fields.
- Increasing the size of the septic tank absorption field helps to improve performance.

Local roads and streets
Suitability: Poorly suited
Management concerns: Soco—slope, low strength, erodibility, frost action, depth to bedrock, and droughtiness; Stecoah—slope, low strength, erodibility, frost action, and depth to bedrock
Management measures and considerations:
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
- Incorporating sand and gravel into the soil, compacting roadbeds, and designing roads that conform to natural slopes help to improve soil strength.

- The soft bedrock in these soils should not be difficult to excavate but will be difficult to vegetate and pack into a fill slope.
- The permanent surfacing of roads or the use of suitable subgrade or base material allows the year-round use of roads and helps to reduce the damage from frost heaving.

Lawns and landscaping
Suitability: Poorly suited
Management concerns: Soco—slope, climate, erodibility, soil fertility, depth to bedrock, and droughtiness; Stecoah—slope, climate, erodibility, soil fertility, and depth to bedrock
Management measures and considerations:
- These soils are difficult to manage for lawns and landscaping because of the damaging high winds and the slope which limits equipment use.
- Designing plantings on natural contours helps to increase water infiltration.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Using lime, fertilizer, mulch, irrigation, and varieties adapted to droughty conditions helps to establish lawns and landscape plants.
- Topsoil should be stockpiled from disturbed areas and replaced before landscaping.
- The use of native landscape plants that are tolerant of droughty, acidic soils is recommended.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of the moderately deep rooting depth, the Soco soil is difficult to manage for lawns and landscaping, especially if the soil has been disturbed.
- If excavated material is to be used for landscaping, any soft bedrock will need to be crushed or removed.

Interpretive Groups

Land capability classification: 6c

SnE—Soco-Stecoah complex, windswept, 30 to 50 percent slopes, stony

Setting

Landscape: Intermediate mountains, dominantly near the Cherokee County line in the southern part of the county
Elevation range: 3,460 to 4,730 feet
Landform: Ridges
Landform position: Summits and upper side slopes
Shape of areas: Long and narrow
Size of areas: Up to 48 acres

Map Unit Composition

Soco soil and similar inclusions: 55 percent
Stecoah soil and similar inclusions: 35 percent
Dissimilar inclusions: 10 percent

Typical Profile

Soco

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 3 inches—dark yellowish brown channery loam

Subsoil:
3 to 23 inches—brownish yellow channery sandy loam

Bedrock:
23 to 80 inches—weathered, interbedded metasandstone and phyllite

Stecoah

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 6 inches—dark brown channery loam

Subsoil:
6 to 13 inches—dark yellowish brown channery loam
13 to 37 inches—yellowish brown channery loam

Underlying material:
37 to 49 inches—channery loam saprolite multicolored in shades of brown and yellow

Bedrock:
49 to 80 inches—weathered, interbedded metasandstone and phyllite

Soil Properties and Qualities

Depth class: Soco—moderately deep; Stecoah—deep
Drainage class: Well drained
General texture class: Loamy
Permeability: Moderately rapid
Available water capacity: Low
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Steep
Soil slippage potential: Low
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: Widely scattered flagstones and stones that average about 6 to 24 inches in length and are about 25 to 75 feet apart
Organic matter content of surface layer: Low to high
Potential for frost action: Moderate
Soil reaction: Extremely acid to strongly acid throughout the profile
Special climatic conditions: Soils subject to damaging high winds
Parent material: Residuum affected by soil creep in the upper part, weathered from low-grade metasedimentary rock
Depth to bedrock: Soco—20 to 40 inches to soft bedrock; Stecoah—40 to 60 inches to soft bedrock
Other distinctive properties: Potential for downslope movement when lateral support is removed

Minor Components

Dissimilar inclusions:
- Random areas of Junaluska and Brasstown soils that have more clay in the subsoil and have soft bedrock at a depth of 20 to 60 inches
- Santeetlah soils that have thicker surface layers with more organic matter and have bedrock at a depth of more than 60 inches, in saddles and gaps and in concave areas at the head of drains
- Spivey soils that have more rock fragments in the subsoil and have bedrock at a depth of more than 60 inches, in drainageways and below rock outcrops
- Cheoah and Jeffrey soils that have thicker surface layers with more organic matter, on north- to east-facing side slopes
- Ditney and Unicoi soils that have hard bedrock at a depth of 7 to 40 inches, on south- to west-facing shoulder slopes and nose slopes
- Soils that have hard bedrock at a depth of less than 20 inches, adjacent to rock outcrops
- Widely scattered areas of rock outcrop
- Random areas of soils on slopes of less than 30 percent or more than 50 percent
- Random areas where landslides have occurred

Similar inclusions:
- Soco and Stecoah soils that have surface layers of fine sandy loam, sandy loam, or silt loam

Land Use

Dominant Uses: Woodland and wildlife habitat

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns: Soco—climate, equipment use, erodibility, soil fertility, rooting depth, and droughtiness; Stecoah—climate, equipment use, erodibility, soil fertility, and rooting depth
Management measures and considerations:
- These soils are difficult to manage for cultivated crops because of the damaging high winds and the slope which limits equipment use. A site should be selected on better suited soils.

Pasture and hayland
Suitability: Poorly suited
Management concerns: Soco—climate, equipment use, erodibility, soil fertility, rooting depth, and droughtiness; Stecoah—climate, equipment use, erodibility, soil fertility, and rooting depth
Management measures and considerations:
- These soils are difficult to manage for pasture because of the damaging high winds and the slope.
- Growing adapted plants helps to ensure the production of high-quality forage and minimize soil erosion.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using rotational grazing and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.

Figure 19.—Windswept hardwood trees are twisted, stunted, and gnarled by prolonged exposure to high winds and frequent ice storms. These conditions are common on high mountains and prominent side slopes and ridgetops.

- Because of the low available water capacity due to the moderately deep rooting depth, the Soco soil is difficult to manage for the production of pasture and hay crops.
- Using drought-tolerant plants helps to increase productivity.

Orchard and ornamental crops
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for orchard and ornamental crops because of the damaging high winds, slope, erodibility, and the depth to bedrock and droughtiness in areas of the Soco soil. A site should be selected on better suited soils.

Woodland Management and Productivity

Potential for commercial species: Very low
Management concerns:
- This map unit is severely limited for timber production because of the damaging high winds (fig. 19), low productivity, and the depth to bedrock in the Soco soil. A site should be selected on better suited soils.

Urban Development

Dwellings
Suitability: Poorly suited
Management concerns: Soco—slope, erodibility, climate, corrosivity, and depth to bedrock; Stecoah—slope, erodibility, climate, and corrosivity
Management measures and considerations:
- Designing structures on the contour with the natural slope or building in less sloping areas helps to improve soil performance.

- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
- Design modifications are needed to overcome the effects of damaging high winds.
- Using corrosion-resistant materials helps to reduce the risk of damage to uncoated steel and concrete, foundations, and basements.
- The soft bedrock in these soils should not be difficult to excavate but will be difficult to vegetate and pack into a fill slope.

Septic tank absorption fields
Suitability: Poorly suited
Management concerns: Slope and depth to bedrock
Management measures and considerations:
- Contact the local Health Department for guidance on sanitary facilities.
- Installing distribution lines on the contour helps to improve the performance of septic tank absorption fields.
- Locating and using areas of the deeper Stecoah soil may improve the performance of filter fields.
- Increasing the size of the septic tank absorption field helps to improve performance.

Local roads and streets
Suitability: Poorly suited
Management concerns: Soco—slope, low strength, erodibility, frost action, depth to bedrock, and droughtiness; Stecoah—slope, low strength, erodibility, frost action, and depth to bedrock
Management measures and considerations:
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Because of the droughty nature of these soils, revegetating cut and fill slopes can be difficult.
- Incorporating sand and gravel into the soil, compacting roadbeds, and designing roads that conform to natural slopes help to improve soil strength.
- The soft bedrock in these soils should not be difficult to excavate but will be difficult to vegetate and pack into a fill slope.
- The permanent surfacing of roads or the use of suitable subgrade or base material allows the year-round use of roads and helps to reduce the damage from frost heaving.

Lawns and landscaping
Suitability: Poorly suited
Management concerns: Soco—slope, climate, erodibility, soil fertility, depth to bedrock, and droughtiness; Stecoah—slope, climate, erodibility, soil fertility, and depth to bedrock
Management measures and considerations:
- These soils are difficult to manage for lawns and landscaping because of the damaging high winds and the slope which limits equipment use.
- Designing plantings on natural contours helps to increase water infiltration.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.

- Using lime, fertilizer, mulch, irrigation, and varieties adapted to droughty conditions helps to establish lawns and landscape plants.
- Topsoil should be stockpiled from disturbed areas and replaced before landscaping.
- The use of native landscape plants that are tolerant of droughty, acidic soils is recommended.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of the moderately deep rooting depth, the Soco soil is difficult to manage for lawns and landscaping, especially if the soil has been disturbed.
- If excavated material is to be used for landscaping, any soft bedrock will need to be crushed or removed.

Interpretive Groups

Land capability classification: Soco—6s; Stecoah—6c

SpE—Spivey-Santeetlah complex, 30 to 50 percent slopes, very bouldery

Setting

Landscape: Low and intermediate mountains throughout the county
Elevation range: 1,080 to 5,000 feet
Landform: Coves, drainageways, and colluvial fans
Landform position: Head slopes and footslopes
Shape of areas: Long and narrow or irregular
Size of areas: Up to 131 acres

Map Unit Composition

Spivey soil and similar inclusions: 50 percent
Santeetlah soil and similar inclusions: 40 percent
Dissimilar inclusions: 10 percent

Typical Profile

Spivey

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 12 inches—very dark grayish brown very flaggy loam

Subsoil:
12 to 30 inches—brown very stony loam
30 to 80 inches—yellowish brown very stony sandy loam

Santeetlah

Surface layer:
0 to 2 inches—moderately decomposed plant material
2 to 6 inches—very dark brown loam
6 to 17 inches—dark brown loam

Subsoil:
17 to 39 inches—dark yellowish brown loam

Underlying material:
39 to 49 inches—dark yellowish brown channery loam
49 to 80 inches—very channery loam multicolored in shades of brown

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
General texture class: Spivey—loamy with many rock fragments; Santeetlah—loamy
Permeability: Moderately rapid
Available water capacity: Spivey—low; Santeetlah—moderate
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Steep
Soil slippage potential: Spivey—medium; Santeetlah—low
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: About 3 percent stones and boulders that average about 15 to 48 inches in length and are about 10 to 65 feet apart
Organic matter content of surface layer: High or very high
Potential for frost action: Spivey—low; Santeetlah—moderate
Special climatic conditions: Soils subject to slow air drainage, which allows late spring and early fall frosts
Soil reaction: Extremely acid to moderately acid throughout the profile
Parent material: Colluvium derived from low-grade metasedimentary rock
Depth to bedrock: More than 60 inches
Other distinctive properties: Random areas of seeps and springs; soils subject to overland flow of storm water from adjacent uplands; soil slippage potential when soils are saturated; a high content of rock fragments in the Spivey soil

Minor Components

Dissimilar inclusions:
- Areas of rubble land, below rock outcrops and in drainageways
- Random areas of soils that have more clay in the subsoil
- Soils that have bedrock at a depth of less than 6.0 feet, in drainageways and on the outer edge of map unit delineations
- Soils that are poorly drained, in areas of seeps and springs
- Soils that have a seasonal high water table at a depth of less than 6.0 feet, in depressions and on toeslopes
- Random areas of soils on slopes of less than 30 percent or more than 50 percent

Similar inclusions:
- Spivey and Santeetlah soils that have surface layers of sandy loam or fine sandy loam

Land Use

Dominant Uses: Woodland and wildlife habitat
Other Uses: Recreation, building site development, and pasture

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, and very bouldery surface. A site should be selected on better suited soils.

Pasture and hayland
Suitability: Pasture—poorly suited; hayland—unsuited

Management concerns: Equipment use, a very bouldery surface, erodibility, pesticide retention, and soil fertility

Management measures and considerations:

- The slope and surface stones limit the use of equipment and may be hazardous.
- Growing adapted plants helps to ensure the production of high-quality forage and minimize soil erosion.
- Fencing livestock away from creeks and streams helps to prevent streambank erosion and sedimentation.
- These soils may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using rotational grazing and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.

Orchard and ornamental crops

Suitability: Unsuited

Management concerns:

- This map unit is severely limited for orchard and ornamental crops because of the slope, erodibility, very stony surface, and the high content of rock fragments in the Spivey soil. A site should be selected on better suited soils.

Woodland Management and Productivity

Potential for commercial species: High for cove hardwoods

Suitability: Suited

Management concerns: Equipment use and erodibility

Management measures and considerations:

- Using cable logging methods helps to overcome, especially where slope exceeds 40 percent, limited road and trail construction caused by the large number of stones and boulders on the soil surface.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.
- When the soil is wet, skid trails and unsurfaced roads are highly erodible and very slick due to the slope and the high content of organic matter in the surface layer.
- Avoiding logging operations during periods when the soil is saturated helps to prevent rutting of the soil surface and damage to tree roots due to soil compaction.
- Leaving a buffer zone of trees and shrubs adjacent to streams helps to minimize siltation and provides shade for the aquatic habitat.
- Livestock should not be allowed to graze in areas managed for woodland.

Urban Development

Dwellings

Suitability: Spivey—unsuited; Santeetlah—poorly suited

Management concerns: Slope, large stones, erodibility, seeps and springs, corrosivity, and unstable excavation walls

Management measures and considerations:

- An onsite investigation is needed to determine the suitability and limitations of any area within this map unit.

- Large stones and boulders will be encountered during excavation.
- Designing structures on the contour with the natural slope or building in less sloping areas helps to improve soil performance.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Installing a subsurface drainage system around foundations helps to intercept water from seeps and springs.
- Locating structures away from intermittent and perennial drainageways helps to minimize structural damage from overland flow of storm water.
- Using corrosion-resistant materials helps to reduce the risk of damage to uncoated steel and concrete.
- Installing permanent retaining walls helps to improve soil stability.

Septic tank absorption fields

Suitability: Spivey—unsuited; Santeetlah—poorly suited

Management concerns: Spivey—large stones, slope, seeps and springs, and poor filtering capacity; Santeetlah—large stones, slope, and seeps and springs

Management measures and considerations:

- Contact the local Health Department for guidance on sanitary facilities.
- Large stones and boulders will be encountered during excavation.
- Installing distribution lines on the contour helps to improve the performance of septic tank absorption fields.
- Excavations may cut into seeps and springs. These areas should be avoided.
- Measures that improve the filtering capacity should be considered; the Santeetlah soil readily absorbs but does not adequately filter effluent.

Local roads and streets

Suitability: Poorly suited

Management concerns: Spivey—slope, erodibility, large stones, seeps and springs, and differential settling; Santeetlah—slope, erodibility, large stones, seeps and springs, and frost action

Management measures and considerations:

- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Large stones and boulders will be encountered during excavation.
- Intercepting and diverting underground water from seeps and springs helps to stabilize cut and fill slopes.
- The Santeetlah soil is subject to uneven settling and may be unstable if not properly compacted.
- The permanent surfacing of roads or the use of suitable subgrade or base material allows the year-round use of roads and helps to reduce the damage from frost heaving.

Lawns and landscaping

Suitability: Poorly suited

Management concerns: Slope, erodibility, large stones, climate, pesticide retention, and soil fertility

Management measures and considerations:

- This map unit is severely limited for lawns and landscaping because of the slope, very stony surface, and the high content of rock fragments in the Spivey soil.
- Designing plantings on natural contours helps to increase water infiltration.

- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.
- These soils may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to landscape plants.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Using lime, fertilizer, mulch, and irrigation helps to establish lawns and landscape plants.
- Topsoil should be stockpiled from disturbed areas and replaced before landscaping.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.

Interpretive Groups

Land capability classification: 6s

SpF—Spivey-Santeetlah complex, 50 to 95 percent slopes, very bouldery

Setting

Landscape: Intermediate mountains in the southeastern part of the county
Elevation range: 1,130 to 4,850 feet
Landform: Coves, drainageways, and colluvial fans
Landform position: Head slopes and footslopes
Shape of areas: Long and narrow or irregular
Size of areas: Up to 55 acres

Map Unit Composition

Spivey soil and similar inclusions: 50 percent
Santeetlah soil and similar inclusions: 40 percent
Dissimilar inclusions: 10 percent

Typical Profile

Spivey

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 12 inches—very dark grayish brown very flaggy loam

Subsoil:
12 to 30 inches—brown very stony loam
30 to 80 inches—yellowish brown very stony sandy loam

Santeetlah

Surface layer:
0 to 2 inches—moderately decomposed plant material
2 to 6 inches—very dark brown loam
6 to 17 inches—dark brown loam

Subsoil:
17 to 39 inches—dark yellowish brown loam

Underlying material:
39 to 49 inches—dark yellowish brown channery loam
49 to 80 inches—very channery loam multicolored in shades of brown

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
General texture class: Spivey—loamy with many rock fragments; Santeetlah—loamy
Permeability: Moderately rapid
Available water capacity: Spivey—low; Santeetlah—moderate
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Very steep
Soil slippage potential: Spivey—medium; Santeetlah—low
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: About 3 percent stones and boulders that average about 15 to 48 inches in length and are about 10 to 65 feet apart
Organic matter content of surface layer: High or very high
Potential for frost action: Spivey—low; Santeetlah—moderate
Special climatic conditions: Soils subject to slow air drainage, which allows late spring and early fall frosts
Soil reaction: Extremely acid to moderately acid throughout the profile
Parent material: Colluvium derived from low-grade metasedimentary rock
Depth to bedrock: More than 60 inches
Other distinctive properties: Random areas of seeps and springs; soils subject to overland flow of storm water from adjacent uplands; soil slippage potential when soils are saturated; a high content of rock fragments in the Spivey soil

Minor Components

Dissimilar inclusions:
- Areas of rubble land, below rock outcrops and in drainageways
- Soils that have bedrock at a depth of less than 6.0 feet, in drainageways and on the outer edge of map unit delineations
- Soils that have a seasonal high water table at a depth of less than 6.0 feet, in depressions and on toeslopes
- Soils that are poorly drained, in areas of seeps and springs
- Random areas of soils on slopes of less than 50 percent or more than 95 percent

Similar inclusions:
- Spivey and Santeetlah soils that have surface layers of sandy loam or fine sandy loam

Land Use

Dominant Uses: Woodland and wildlife habitat
Other Uses: Recreation

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, and very bouldery surface. A site should be selected on better suited soils.

Pasture and hayland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for the production of pasture and hay crops because of the equipment use limitation, very bouldery surface, erodibility, pesticide retention, and soil fertility. A site should be selected on better suited soils.

Orchard and ornamental crops
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for orchard and ornamental crops because of the slope, erodibility, very bouldery surface, and the high content of rock fragments in the Spivey soil. A site should be selected on better suited soils.

Woodland Management and Productivity

Potential for commercial species: High for cove hardwoods
Suitability: Poorly suited
Management concerns: Equipment use, erodibility, and pesticide retention
Management measures and considerations:
- Using cable logging methods helps to overcome limitations caused by the slope and the large number of stones and boulders on the soil surface.
- Leaving a buffer zone of trees and shrubs adjacent to streams helps to minimize siltation and provides shade for the aquatic habitat.
- Livestock should not be allowed to graze in areas managed for woodland.

Urban Development

Dwellings
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for dwellings because of the slope, large stones and boulders, erodibility, seeps and springs, corrosivity, and unstable excavation walls. A site should be selected on better suited soils.

Septic tank absorption fields
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for septic tank absorption fields because of the large stones and boulders, slope, seeps and springs, and the poor filtering capacity in the Spivey soil. Contact the local Health Department for additional guidance.

Local roads and streets
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for lawns and landscaping because of the slope, erodibility, large stones and boulders, seeps and springs, the differential settling in areas of the Spivey soil, and the frost action in areas of the Santeetlah soil. A site should be selected on better suited soils.

Lawns and landscaping
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for lawns and landscaping because of the slope, erodibility, large stones and boulders, climate, pesticide retention, and soil fertility. A site should be selected on better suited soils.

Interpretive Groups

Land capability classification: 7s

SvC—Spivey-Whiteoak complex, 8 to 15 percent slopes, bouldery

Setting

Landscape: Low and intermediate mountains throughout the county
Elevation range: 1,070 to 4,850 feet
Landform: Coves, drainageways, and colluvial fans
Landform position: Footslopes and toeslopes
Shape of areas: Long and narrow or irregular
Size of areas: Up to 248 acres

Map Unit Composition

Spivey soil and similar inclusions: 40 percent
Whiteoak soil and similar inclusions: 35 percent
Dissimilar inclusions: 25 percent

Typical Profile

Spivey

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 12 inches—very dark grayish brown very flaggy loam

Subsoil:
12 to 30 inches—brown very stony loam
30 to 80 inches—yellowish brown very stony sandy loam

Whiteoak

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 9 inches—very dark grayish brown loam

Subsoil:
9 to 34 inches—dark yellowish brown loam
34 to 46 inches—yellowish brown loam

Underlying material:
46 to 60 inches—yellowish brown channery loam
60 to 80 inches—dark yellowish brown very channery loam with mottles in shades of brown and yellow

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
General texture class: Spivey—loamy with many rock fragments; Whiteoak—loamy
Permeability: Spivey—moderately rapid; Whiteoak—moderately rapid in the surface horizon and underlying material and moderate in the subsoil
Available water capacity: Spivey—low; Whiteoak—moderate
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low

Slope class: Strongly sloping
Soil slippage potential: None
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Severe
Rock fragments on the surface: Widely scattered stones and boulders that average about 15 to 48 inches in length and are about 25 to 75 feet apart
Organic matter content of surface layer: Moderate or high
Potential for frost action: Spivey—low; Whiteoak—moderate
Special climatic conditions: Soils subject to slow air drainage, which allows late spring and early fall frosts
Soil reaction: Spivey—extremely acid to moderately acid throughout; Whiteoak—very strongly acid to moderately acid throughout
Parent material: Colluvium derived from low-grade metasedimentary rock
Depth to bedrock: More than 60 inches
Other distinctive properties: Random areas of seeps and springs; soils subject to overland flow of storm water from adjacent uplands; a high content of rock fragments in the Spivey soil

Minor Components

Dissimilar inclusions:
- Areas of rubble land in drainageways
- Areas of Spivey soils where the surface fragments have been removed
- Soils that are poorly drained, in areas of seeps and springs
- Soils that have a seasonal high water table at a depth of less than 6.0 feet, in depressions and on toeslopes
- Areas that are occasionally flooded for very brief periods, along stream channels
- Soils that have bedrock at a depth of less than 6.0 feet, in drainageways and on the outer edge of map unit delineations
- Random areas of soils on slopes of less than 8 percent or more than 15 percent

Similar inclusions:
- Spivey and Whiteoak soils that have surface layers of sandy loam or fine sandy loam

Land Use

Dominant Uses: Pasture, hayland, and ornamental crops
Other Uses: Building site development, recreation, woodland, and wildlife habitat

Agricultural Development

Cropland

Suitability: Spivey—unsuited; Whiteoak—suited
Management concerns: Equipment use, erodibility, soil fertility, pesticide retention, and climate
Management measures and considerations:
- This map unit is severely limited for crop production because of the bouldery surface and the high content of rock fragments in the Spivey soil.
- An onsite investigation is needed to determine the suitability and limitations of any area within this map unit for cropland.
- The slope may limit equipment use in the steeper areas.
- Using conservation practices, such as contour farming, winter cover crops, and crop rotations which include grasses and legumes, helps to minimize soil erosion, maximize the infiltration of rainfall, increase the available water capacity, and improve soil fertility.

- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes crop productivity.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.

Pasture and hayland
Suitability: Suited
Management concerns: Erodibility, equipment use, pesticide retention, and soil fertility
Management measures and considerations:
- The slope and surface stones and boulders limit the use of equipment and may be hazardous.
- Growing adapted plants helps to ensure the production of high-quality forage and minimize soil erosion.
- Fencing livestock away from creeks and streams helps to prevent streambank erosion and sedimentation.
- These soils may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using rotational grazing, implementing a well planned harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.

Orchard and ornamental crops
Suitability: Spivey—unsuited; Whiteoak—suited
Management concerns: Equipment use, ball and burlap harvesting, erodibility, climate, pesticide retention, soil fertility, and large stones and boulders
Management measures and considerations:
- This map unit is severely limited for orchard and ornamental crops because of the bouldery surface and the high content of rock fragments in the Spivey soil.
- The slope may limit equipment use in the steeper areas.
- Avoiding ball and burlap harvesting during dry periods helps to prevent fracture of the ball and separation of the soil from the roots caused by the low moisture content of the Spivey soil.
- Establishing and maintaining sod between rows and on access roads helps to reduce the hazard of erosion.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.
- These soils may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximize productivity.

Woodland Management and Productivity

Potential for commercial species: High for cove hardwoods
Suitability: Suited
Management concerns: Equipment use and erodibility

Management measures and considerations:
- Using cable logging methods helps to overcome limited road and trail construction caused by the large number of stones and boulders on the soil surface.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.
- When the soil is wet, skid trails and unsurfaced roads are highly erodible and very slick due to the slope and the high content of organic matter in the surface layer.
- Avoiding logging operations during periods when the soil is saturated helps to prevent rutting of the soil surface and damage to tree roots due to soil compaction.
- Leaving a buffer zone of trees and shrubs adjacent to streams helps to minimize siltation and provides shade for the aquatic habitat.
- Livestock should not be allowed to graze in areas managed for woodland.

Urban Development

Dwellings

Suitability: Spivey—poorly suited; Whiteoak—suited
Management concerns: Large stones and boulders, slope, erodibility, seeps and springs, corrosivity, and unstable excavation walls
Management measures and considerations:
- An onsite investigation is needed to determine the suitability and limitations of any area within this map unit.
- Large stones and boulders will be encountered during excavation.
- Designing structures so that they conform with natural slopes helps to improve soil performance.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Installing a subsurface drainage system around foundations helps to intercept water from seeps and springs.
- Locating structures away from intermittent and perennial drainageways helps to minimize structural damage from overland flow of storm water.
- Using corrosion-resistant materials helps to reduce the risk of damage to concrete.
- Installing permanent retaining walls helps to improve soil stability.

Septic tank absorption fields

Suitability: Spivey—unsuited; Whiteoak—suited
Management concerns: Spivey—large stones, slope, seeps and springs, and poor filtering capacity; Whiteoak—large stones, slope, and seeps and springs
Management measures and considerations:
- Contact the local Health Department for guidance on sanitary facilities.
- Large stones and boulders will be encountered during excavation.
- Installing distribution lines on the contour helps to improve the performance of septic tank absorption fields.
- Excavations may cut into seeps and springs. These areas should be avoided.
- Measures that improve the filtering capacity should be considered; the Spivey soil readily absorbs but does not adequately filter effluent.

Local roads and streets

Suitability: Suited

Management concerns: Spivey—large stones, slope, erodibility, seeps and springs, and differential settling; Whiteoak—large stones, slope, erodibility, seeps and springs, and frost action

Management measures and considerations:
- Large stones and boulders will be encountered during excavation.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Intercepting and diverting underground water from seeps and springs helps to stabilize cut and fill slopes.
- The Spivey soil is subject to uneven settling and may be unstable if not properly compacted.
- The permanent surfacing of roads or the use of suitable subgrade or base material allows the year-round use of roads and helps to reduce the damage from frost heaving.

Lawns and landscaping

Suitability: Spivey—poorly suited; Whiteoak—suited

Management concerns: Large stones, slope, erodibility, climate, pesticide retention, soil fertility, and root disease

Management measures and considerations:
- The bouldery surface and the high content of rock fragments in the Spivey soil are limitations affecting lawns and landscaping.
- Designing plantings on natural contours helps to increase water infiltration.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.
- These soils may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to landscape plants.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Using lime, fertilizer, mulch, and irrigation helps to establish lawns and landscape plants.
- Topsoil should be stockpiled from disturbed areas and replaced before landscaping.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.

Interpretive Groups

Land capability classification: Spivey—6s; Whiteoak—3e

SvD—Spivey-Whiteoak complex, 15 to 30 percent slopes, bouldery

Setting

Landscape: Low and intermediate mountains throughout the county
Elevation range: 1,080 to 4,950 feet
Landform: Coves, drainageways, and colluvial fans
Landform position: Footslopes and toeslopes
Shape of areas: Long and narrow or irregular
Size of areas: Up to 331 acres

Map Unit Composition

Spivey soil and similar inclusions: 40 percent
Whiteoak soil and similar inclusions: 35 percent
Dissimilar inclusions: 25 percent

Typical Profile

Spivey

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 12 inches—very dark grayish brown very flaggy loam

Subsoil:
12 to 30 inches—brown very stony loam
30 to 80 inches—yellowish brown very stony sandy loam

Whiteoak

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 9 inches—very dark grayish brown loam

Subsoil:
9 to 34 inches—dark yellowish brown loam
34 to 46 inches—yellowish brown loam

Underlying material:
46 to 60 inches—yellowish brown channery loam
60 to 80 inches—dark yellowish brown very channery loam with mottles in shades of brown and yellow

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
General texture class: Spivey—loamy with many rock fragments; Whiteoak—loamy
Permeability: Spivey—moderately rapid; Whiteoak—moderately rapid in the surface horizon and underlying material and moderate in the subsoil
Available water capacity: Spivey—low; Whiteoak—moderate
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Moderately steep
Soil slippage potential: None
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: Widely scattered stones and boulders that average about 15 to 48 inches in length and are about 25 to 75 feet apart (fig. 20)
Organic matter content of surface layer: Moderate or high
Potential for frost action: Spivey—low; Whiteoak—moderate
Special climatic conditions: Soils subject to slow air drainage, which allows late spring and early fall frosts
Soil reaction: Spivey—extremely acid to moderately acid throughout; Whiteoak—very strongly acid to moderately acid throughout
Parent material: Colluvium derived from low-grade metasedimentary rock
Depth to bedrock: More than 60 inches

Figure 20.—Hay and cropland in an area of Spivey-Whiteoak complex, 15 to 30 percent slopes, bouldery. Removal of surface stones and boulders is necessary for the production of row crops or hay in areas of this map unit.

Other distinctive properties: Random areas of seeps and springs; soils subject to overland flow of storm water from adjacent uplands; a high content of rock fragments in the Spivey soil

Minor Components

Dissimilar inclusions:
- Areas of rubble land in drainageways
- Areas of Spivey soils where the surface fragments have been removed
- Soils that have a seasonal high water table at a depth of less than 6.0 feet, in depressions and on toeslopes
- Soils that have bedrock at a depth of less than 6.0 feet, in drainageways and on the outer edge of map unit delineations
- Areas that are rarely flooded for very brief periods, along stream channels
- Random areas of soils on slopes of less than 15 percent or more than 30 percent

Similar inclusions:
- Spivey and Whiteoak soils that have surface layers of sandy loam or fine sandy loam

Land Use

Dominant Uses: Woodland and wildlife habitat
Other Uses: Pasture, recreation, and building site development

Agricultural Development

Cropland
Suitability: Spivey—unsuited; Whiteoak—poorly suited
Management concerns: Equipment use, erodibility, soil fertility, pesticide retention, and climate

Management measures and considerations:
- This map unit is severely limited for crop production because of the slope, erodibility, bouldery surface, and the high content of rock fragments in the Spivey soil.
- An onsite investigation is needed to determine the suitability and limitations of any area within this map unit for cropland.
- Using conservation practices, such as contour farming, winter cover crops, and crop rotations which include grasses and legumes, helps to minimize soil erosion, maximize the infiltration of rainfall, increase the available water capacity, and improve soil fertility.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes crop productivity.
- These soils may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.

Pasture and hayland
Suitability: Pasture—poorly suited; hayland—unsuited
Management concerns: Equipment use, erodibility, pesticide retention, and soil fertility
Management measures and considerations:
- The slope and surface stones and boulders limit the use of equipment and may be hazardous.
- Growing adapted plants helps to ensure the production of high-quality forage and minimize soil erosion.
- Fencing livestock away from creeks and streams helps to prevent streambank erosion and sedimentation.
- These soils may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using rotational grazing, implementing a well planned harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.

Orchard and ornamental crops
Suitability: Spivey—unsuited; Whiteoak—suited
Management concerns: Equipment use, ball and burlap harvesting, erodibility, climate, pesticide retention, soil fertility, and large stones and boulders
Management measures and considerations:
- The Spivey soil is unsuited to orchard and ornamental crops because of the bouldery surface and high content of rock fragments.
- The slope may limit equipment use in the steeper areas.
- Establishing and maintaining sod between rows and on access roads helps to reduce the hazard of erosion.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.
- These soils may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides.

- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximize productivity.

Woodland Management and Productivity

Potential for commercial species: High for cove hardwoods
Suitability: Suited
Management concerns: Equipment use and erodibility
Management measures and considerations:
- Using cable logging methods helps to overcome limited road and trail construction caused by the large number of boulders on the soil surface.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Using cable logging methods helps to overcome limited road and trail construction caused by the large number of boulders on the soil surface.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.
- When the soil is wet, skid trails and unsurfaced roads are highly erodible and very slick due to the slope and the high content of organic matter in the surface layer.
- Avoiding logging operations during periods when the soil is saturated helps to prevent rutting of the soil surface and damage to tree roots due to soil compaction.
- Leaving a buffer zone of trees and shrubs adjacent to streams helps to minimize siltation and provides shade for the aquatic habitat.
- Livestock should not be allowed to graze in areas managed for woodland.

Urban Development

Dwellings

Suitability: Spivey—poorly suited; Whiteoak—suited
Management concerns: Large stones and boulders, slope, erodibility, seeps and springs, corrosivity, and unstable excavation walls
Management measures and considerations:
- An onsite investigation is needed to determine the suitability and limitations of any area within this map unit.
- Large stones and boulders will be encountered during excavation.
- Designing structures so that they conform with natural slopes helps to improve soil performance.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Installing a subsurface drainage system around foundations helps to intercept water from seeps and springs.
- Locating structures away from intermittent and perennial drainageways helps to minimize structural damage from overland flow of storm water.
- Using corrosion-resistant materials helps to reduce the risk of damage to concrete.
- Installing permanent retaining walls helps to improve soil stability.

Septic tank absorption fields

Suitability: Spivey—unsuited; Whiteoak—suited
Management concerns: Spivey—large stones, slope, seeps and springs, and poor filtering capacity; Whiteoak—large stones, slope, and seeps and springs

Management measures and considerations:
• Contact the local Health Department for guidance on sanitary facilities.
• Large stones and boulders will be encountered during excavation.
• Installing distribution lines on the contour helps to improve the performance of septic tank absorption fields.
• Excavations may cut into seeps and springs. These areas should be avoided.
• Measures that improve the filtering capacity should be considered; the Spivey soil readily absorbs but does not adequately filter effluent.

Local roads and streets
Suitability: Suited
Management concerns: Spivey—large stones, slope, erodibility, seeps and springs, and differential settling; Whiteoak—large stones, slope, erodibility, seeps and springs, and frost action
Management measures and considerations:
• Large stones and boulders will be encountered during excavation.
• Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
• Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
• Intercepting and diverting underground water from seeps and springs helps to stabilize cut and fill slopes.
• The Spivey soil is subject to uneven settling and may be unstable if not properly compacted.
• The permanent surfacing of roads or the use of suitable subgrade or base material allows the year-round use of roads and helps to reduce the damage from frost heaving.

Lawns and landscaping
Suitability: Poorly suited
Management concerns: Large stones, slope, erodibility, climate, pesticide retention, soil fertility, and root disease
Management measures and considerations:
• The bouldery surface and the high content of rock fragments in the Spivey soil are limitations affecting lawns and landscaping.
• Designing plantings on natural contours helps to increase water infiltration.
• Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
• Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.
• These soils may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to landscape plants.
• Plant-applied pesticides may be more effective than soil-applied pesticides.
• Using lime, fertilizer, mulch, and irrigation helps to establish lawns and landscape plants.
• Topsoil should be stockpiled from disturbed areas and replaced before landscaping.
• In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.

Interpretive Groups

Land capability classification: Spivey—6s; Whiteoak—4e

SwB—Statler loam, 2 to 8 percent slopes, rarely flooded

Setting

Landscape: Mountain valleys of low and intermediate mountains and intermountain hills throughout the county
Elevation range: 1,800 to 3,000 feet
Landform: Low stream terraces
Landform position: Concave to planar toeslopes
Shape of areas: Long and narrow
Size of areas: Up to 24 acres

Map Unit Composition

Statler soil and similar inclusions: 90 percent
Dissimilar inclusions: 10 percent

Typical Profile

Surface layer:
0 to 8 inches—dark brown loam

Subsoil:
8 to 25 inches—strong brown clay loam
25 to 55 inches—yellowish brown loam

Underlying material:
55 to 80 inches—yellowish brown fine sandy loam with mottles in shades of red and brown

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
General texture class: Loamy
Permeability: Moderate
Available water capacity: Moderate or high
Depth to seasonal high water table: 4.0 to 6.0 feet from January through December
Hazard of flooding: Rare, throughout the year with standing water for less than 2 days
Shrink-swell potential: Low
Slope class: Gently sloping
Soil slippage potential: None
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Moderate
Organic matter content of surface layer: High
Potential for frost action: Moderate
Soil reaction: Strongly acid or moderately acid in the A horizon, except in limed areas, and very strongly acid to slightly acid in the B and C horizons
Parent material: Old alluvium derived from low-grade metasedimentary rock
Depth to bedrock: More than 60 inches
Other distinctive properties: Soil subject to overland flow of storm water from adjacent uplands

Minor Components

Dissimilar inclusions:
- Areas of moderately eroded soils and soils that have surface layers with less organic matter, in cropped fields

- Random areas of Thurmont soils that have a seasonal high water table at a depth of 40 to 60 inches
- Moderately well drained Dillard soils on low terraces
- Poorly drained soils that have loamy to clayey subsoils, in backwater areas
- Moderately well drained Reddies soils along stream channels
- Random areas of soils on slopes of less than 2 percent or more than 8 percent

Similar inclusions:
- Statler soils that have surface layers of sandy loam, fine sandy loam, or sandy clay loam

Land Use

Dominant Uses: Cropland and ornamental crops
Other Uses: Pasture and hayland

Agricultural Development

Cropland
Suitability: Well suited
Management concerns: Erodibility, climate, tilth, and soil fertility
Management measures and considerations:
- Using conservation practices, such as contour farming, winter cover crops, and crop rotations which include grasses and legumes, helps to minimize soil erosion, maximize the infiltration of rainfall, increase the available water capacity, and improve soil fertility.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.
- Avoiding tillage during wet periods, incorporating crop residue into the soil, or leaving residue on the soil surface helps to minimize clodding and crusting and increases the infiltration of rainfall.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes crop productivity.

Pasture and hayland
Suitability: Well suited
Management concerns: Erodibility and soil fertility
Management measures and considerations:
- Preparing seedbeds on the contour or across the slope helps to minimize soil erosion and increases germination.
- Growing adapted plants helps to ensure the production of high-quality forage and minimize soil erosion.
- Fencing livestock away from creeks and streams helps to prevent streambank erosion and sedimentation.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using rotational grazing, implementing a well planned harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.

Orchard and ornamental crops
Suitability: Suited
Management concerns: Erodibility, climate, root disease, and soil fertility
Management measures and considerations:
- Establishing and maintaining sod between rows and on access roads helps to reduce the hazard of erosion.

- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.
- Because of the restricted movement of air and water due to the clay content of the subsoil, phytophthora root disease is a potential limitation for Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximize productivity.

Woodland Management and Productivity

Potential for commercial species: Moderately high for cove hardwoods and very high for eastern white pine
Suitability: Well suited
Management concerns: Erodibility and equipment use
Management measures and considerations:
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.
- When the soil is wet, skid trails and unsurfaced roads are highly erodible and very slick due to the slope, the high content of organic matter in the surface layer, and the clay content of the subsoil.
- Avoiding logging operations during periods when the soil is saturated helps to prevent rutting of the soil surface and damage to tree roots due to soil compaction.
- Leaving a buffer zone of trees and shrubs adjacent to streams helps to minimize siltation and provides shade for the aquatic habitat.
- Livestock should not be allowed to graze in areas managed for woodland.

Urban Development

Dwellings
Suitability: Poorly suited
Management concerns: Flooding and erodibility
Management measures and considerations:
- An onsite investigation is needed to determine the suitability and limitations of any area within this map unit for dwellings.

Septic tank absorption fields
Suitability: Poorly suited
Management concerns: Flooding and restricted permeability
Management measures and considerations:
- Contact the local Health Department for guidance on sanitary facilities.
- An onsite investigation is needed to determine the suitability and limitations of any area within this map unit for septic tank absorption fields.
- Excavations may cut into seeps and springs. These areas should be avoided.

Local roads and streets
Suitability: Poorly suited
Management concerns: Low strength, seeps and springs, erodibility, and flooding
Management measures and considerations:
- When the soil is wet, unsurfaced roads are highly erodible and very slick due the content of clay in the subsoil.

- Incorporating sand and gravel into the soil, compacting roadbeds, and designing roads that conform to natural slopes help to improve soil strength.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.

Lawns and landscaping
Suitability: Suited
Management concerns: Erodibility, flooding, root disease, soil fertility, soil compaction, and climate
Management measures and considerations:
- Designing plantings on natural contours helps to increase water infiltration.
- Vegetating disturbed areas and using erosion-control structures, such as sediment fences, help to keep eroding soil on site.
- Because of the restricted movement of air and water due to the clay content of the subsoil, phytophthora root disease is a potential limitation for Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Using lime, fertilizer, mulch, and irrigation helps to establish lawns and landscape plants.
- Topsoil should be stockpiled from disturbed areas and replaced before landscaping.
- Avoiding the use of heavy equipment in areas to be landscaped helps to prevent soil compaction.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.

Interpretive Groups

Land capability classification: 2e

SyD—Sylco-Cataska complex, 15 to 30 percent slopes, very rocky

Setting

Landscape: Low and intermediate mountains in the northwestern, north-central, and southeastern parts of the county
Elevation range: 1,380 to 4,840 feet
Landform: Ridges
Landform position: Summits and upper side slopes
Shape of areas: Long and narrow
Size of areas: Up to 193 acres

Map Unit Composition

Sylco soil and similar inclusions: 60 percent
Cataska soil and similar inclusions: 30 percent
Rock outcrop: 5 percent
Dissimilar inclusions: 5 percent

Typical Profile

Sylco

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 6 inches—dark yellowish brown very channery loam

Subsoil:
6 to 19 inches—strong brown very channery loam
19 to 29 inches—dark yellowish brown very channery loam

Bedrock:
29 to 36 inches—weathered slate
36 to 80 inches—unweathered, hard slate

Cataska

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 5 inches—dark brown very channery loam

Subsoil:
5 to 18 inches—dark yellowish brown very channery loam

Bedrock:
18 to 22 inches—weathered slate
22 to 80 inches—unweathered, hard slate

Soil Properties and Qualities

Depth class: Sylco—moderately deep; Cataska—shallow
Drainage class: Sylco—somewhat excessively drained; Cataska—excessively drained
General texture class: Loamy with many rock fragments
Permeability: Sylco—moderately rapid; Cataska—moderately rapid or rapid
Available water capacity: Low
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Moderately steep
Soil slippage potential: Low
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: Widely scattered stones and cobbles that average about 3 to 24 inches in length and are about 25 to 75 feet apart
Extent of Rock outcrop: About 5 percent of the soil surface
Organic matter content of surface layer: Low to high
Potential for frost action: Moderate
Soil reaction: Extremely acid to strongly acid throughout the profile
Parent material: Residuum weathered from low-grade metasedimentary rock
Depth to bedrock: Sylco—20 to 40 inches to hard bedrock; Cataska—10 to 20 inches to soft bedrock
Other distinctive properties: A high content of rock fragments; water movement along bedrock contacts in the Spivey soil

Minor Components

Dissimilar inclusions:

- Tsali and Junaluska soils that have fewer fragments in the soil, more clay in the subsoil, and soft bedrock at a depth of 10 to 40 inches; on spur ridges

- Random areas of Soco and Stecoah soils that have soft bedrock at a depth of 20 to 60 inches
- Areas of soils that have hard bedrock at a depth of less than 10 inches, adjacent to rock outcrops
- Lonon and Northcove soils that have bedrock at a depth of more than 60 inches, in concave areas at the head of drains and in saddles and gaps
- Random areas of soils on slopes of less than 15 percent or more than 30 percent
- Prominent ridges and upper side slopes that are subject to frequent rime ice in winter and damaging high winds year-round

Similar inclusions:
- Sylco and Cataska soils that have surface layers of sandy loam, fine sandy loam, or silt loam

Land Use

Dominant Uses: Wildlife habitat

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, high content of rock fragments, depth to bedrock, and extent of rock outcrops. A site should be selected on better suited soils.

Pasture and hayland
Suitability: Pasture—poorly suited; hayland—unsuited
Management concerns: Equipment use, erodibility, rooting depth, droughtiness, and soil fertility
Management measures and considerations:
- This map unit is difficult to manage for pasture and hay production because of the slope, erodibility, high content of rock fragments, depth to bedrock, and extent of rock outcrops. A site should be selected on better suited soils.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using rotational grazing, implementing a well planned clipping and harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.

Orchard and ornamental crops
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for orchard and ornamental crops because of the slope, erodibility, high content of rock fragments, depth to bedrock, and extent of rock outcrops. A site should be selected on better suited soils.

Woodland Management and Productivity

Potential for commercial species: Very low
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for timber production because of the slope, erodibility, low productivity, low volume, depth to bedrock, and extent of rock outcrops. A site should be selected on better suited soils.

Urban Development

Dwellings

Suitability: Poorly suited
Management concerns: Depth to bedrock, slope, erodibility, unstable excavation walls, slippage, differential settling, and corrosivity
Management measures and considerations:
- An onsite investigation is needed to determine the suitability and limitations of any area within this map unit.
- Drilling and blasting of rock or special earth-moving equipment is needed to increase the depth of the soils.
- Designing structures on the contour with the natural slope or building in less sloping areas helps to improve soil performance.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Because of the droughty nature of these soils, revegetating cut and fill slopes is difficult.
- Installing permanent retaining walls helps to improve soil stability.
- These soils are subject to uneven settling and may be unstable if not properly compacted.
- Using corrosion-resistant materials helps to reduce the risk of damage to concrete.

Septic tank absorption fields

Suitability: Unsuited
Management concerns:
- This map unit is severely limited for septic tank absorption fields because of the slope, high content of rock fragments, depth to bedrock, and extent of rock outcrops. A site should be selected on better suited soils.

Local roads and streets

Suitability: Poorly suited
Management concerns: Depth to bedrock, slope, erodibility, unstable excavation walls, slippage, differential settling, and frost action
Management measures and considerations:
- The underlying bedrock is susceptible to mass movement. An onsite investigation is needed to determine the suitability and limitations of any area within this map unit for access roads.
- Extensive blasting, shaping, and grading are needed if roads are to be constructed on the contour.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Because of the droughty nature of these soils, revegetating cut and fill slopes is difficult.
- These soils are subject to uneven settling and may be unstable if not properly compacted.
- The permanent surfacing of roads or the use of suitable subgrade or base material allows the year-round use of roads and helps to reduce the damage from frost heaving.

Lawns and landscaping

Suitability: Poorly suited
Management concerns: Slope, erodibility, depth to bedrock, soil fertility, and droughtiness

Management measures and considerations:
- Designing plantings on natural contours helps to increase water infiltration.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Because of the moderately deep rooting depth, these soils are difficult to manage for lawns and landscaping, especially if the soil has been disturbed.
- These soils are limited for lawns and landscaping because of the high amount of rock fragments in the root zone.
- Designing plantings on natural contours helps to increase water infiltration.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Using lime, fertilizer, mulch, and irrigation helps to establish lawns and landscape plants.
- The use of native landscape plants that are tolerant of droughty, acidic soils is recommended.
- In areas where water concentrates, such as toeslopes, footslopes, drainageways, and concave and depressional areas, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.

Interpretive Groups

Land capability classification: Sylco—6s; Cataska—7s

SyE—Sylco-Cataska complex, 30 to 50 percent slopes, very rocky

Setting

Landscape: Low and intermediate mountains in the northwestern, north-central, and southeastern parts of the county
Elevation range: 1,330 to 4,800 feet
Landform: Ridges and south- to west-facing mountain slopes
Landform position: Summits and side slopes
Shape of areas: Long and narrow on summits and irregular on side slopes
Size of areas: Up to 75 acres

Map Unit Composition

Sylco soil and similar inclusions: 45 percent
Cataska soil and similar inclusions: 35 percent
Rock outcrop: 9 percent
Dissimilar inclusions: 11 percent

Typical Profile

Sylco

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 6 inches—dark yellowish brown very channery loam

Subsoil:
6 to 19 inches—strong brown very channery loam
19 to 29 inches—dark yellowish brown very channery loam

Bedrock:
29 to 36 inches—weathered slate
36 to 80 inches—unweathered, hard slate

Cataska

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 5 inches—dark brown very channery loam

Subsoil:
5 to 18 inches—dark yellowish brown very channery loam

Bedrock:
18 to 22 inches—weathered slate
22 to 80 inches—unweathered, hard slate

Soil Properties and Qualities

Depth class: Sylco—moderately deep; Cataska—shallow
Drainage class: Sylco—somewhat excessively drained; Cataska—excessively drained
General texture class: Loamy with many rock fragments
Permeability: Sylco—moderately rapid; Cataska—moderately rapid or rapid
Available water capacity: Low
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Steep
Soil slippage potential: Medium
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: Widely scattered stones and cobbles that average about 3 to 24 inches in length and are about 25 to 75 feet apart
Extent of Rock outcrop: About 9 percent of the soil surface
Organic matter content of surface layer: Low to high
Potential for frost action: Moderate
Soil reaction: Extremely acid to strongly acid throughout the profile
Parent material: Residuum affected by soil creep in the upper part, weathered from low-grade metasedimentary rock
Depth to bedrock: Sylco—20 to 40 inches to hard bedrock; Cataska—10 to 20 inches to soft bedrock
Other distinctive properties: Soils subject to downslope movement when lateral support is removed and to differential settling when used as fill material; a high content of rock fragments; water movement along bedrock contacts in the Sylco soil

Minor Components

Dissimilar inclusions:
- Tsali and Junaluska soils that have fewer fragments in the soil, more clay in the subsoil, and soft bedrock at a depth of 10 to 40 inches; on spur ridges
- Random areas of Soco and Stecoah soils that have soft bedrock at a depth of 20 to 60 inches
- Areas of soils that have hard bedrock at a depth of less than 10 inches, adjacent to rock outcrops

- Spivey soils that have thicker surface layers with more organic matter and have bedrock at a depth of more than 60 inches, in drainageways and below rock outcrops
- Santeetlah soils that have thicker surface layers with more organic matter and have bedrock at a depth of more than 60 inches, on benches, in concave areas at the head of drains, and in saddles and gaps
- Random areas of soils on slopes of less than 30 percent or more than 50 percent

Similar inclusions:
- Sylco and Cataska soils that have surface layers of sandy loam, fine sandy loam, loam, or silt loam

Land Use

Dominant Uses: Wildlife habitat

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, high content of rock fragments, depth to bedrock, and extent of rock outcrops. A site should be selected on better suited soils.

Pasture and hayland
Suitability: Pasture—poorly suited; hayland—unsuited
Management concerns: Equipment use, rooting depth, droughtiness, erodibility, and soil fertility
Management measures and considerations:
- This map unit is difficult to manage for pasture and hay production because of the slope, erodibility, high content of rock fragments, depth to bedrock, and extent of rock outcrops. A site should be selected on better suited soils.

Orchard and ornamental crops
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for orchard and ornamental crops because of the slope, erodibility, high content of rock fragments, depth to bedrock, and extent of rock outcrops. A site should be selected on better suited soils.

Woodland Management and Productivity

Potential for commercial species: Very low
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for timber production because of the slope, erodibility, low productivity, low volume, depth to bedrock, and extent of rock outcrops. A site should be selected on better suited soils.

Urban Development

Dwellings
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for dwellings because of the slope, erodibility, high content of rock fragments, depth to bedrock, and extent of rock outcrops. In addition, the underlying bedrock is susceptible to mass movement. A site should be selected on better suited soils.

Septic tank absorption fields
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for septic tank absorption fields because of the slope, high content of rock fragments, depth to bedrock, and extent of rock outcrops. A site should be selected on better suited soils.

Local roads and streets
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for roads and streets because of the slope, erodibility, high content of rock fragments, depth to bedrock, and extent of rock outcrops. In addition, the underlying bedrock is susceptible to mass movement. A site should be selected on better suited soils.

Lawns and landscaping
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for lawns and landscaping because of the slope, erodibility, high content of rock fragments, depth to bedrock, and extent of rock outcrops. A site should be selected on better suited soils.

Interpretive Groups

Land capability classification: 7s

SyF—Sylco-Cataska complex, 50 to 95 percent slopes, very rocky

Setting

Landscape: Low and intermediate mountains in the northwestern, north-central, and southeastern parts of the county
Elevation range: 1,180 to 4,820 feet
Landform: South- to west-facing mountain slopes
Landform position: Side slopes
Shape of areas: Irregular
Size of areas: Up to 579 acres

Map Unit Composition

Sylco soil and similar inclusions: 50 percent
Cataska soil and similar inclusions: 35 percent
Rock outcrop: 9 percent
Dissimilar inclusions: 6 percent

Typical Profile

Sylco

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 6 inches—dark yellowish brown very channery loam

Subsoil:
6 to 19 inches—strong brown very channery loam
19 to 29 inches—dark yellowish brown very channery loam

Bedrock:
29 to 36 inches—weathered slate
36 to 80 inches—unweathered, hard slate

Cataska

Surface layer:
0 to 1 inch—moderately decomposed plant material
1 to 5 inches—dark brown very channery loam

Subsoil:
5 to 18 inches—dark yellowish brown very channery loam

Bedrock:
18 to 22 inches—weathered slate
22 to 80 inches—unweathered, hard slate

Soil Properties and Qualities

Depth class: Sylco—moderately deep; Cataska—shallow
Drainage class: Sylco—somewhat excessively drained; Cataska—excessively drained
General texture class: Loamy with many rock fragments
Permeability: Sylco—moderately rapid; Cataska—moderately rapid or rapid
Available water capacity: Low
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Very steep
Soil slippage potential: High
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Very severe
Rock fragments on the surface: About 3 percent flagstones and stones that average about 6 to 24 inches in length and are about 3 to 25 feet apart
Extent of Rock outcrop: About 9 percent of the soil surface
Organic matter content of surface layer: Low to high
Potential for frost action: Moderate
Soil reaction: Extremely acid to strongly acid throughout the profile
Parent material: Residuum affected by soil creep in the upper part, weathered from low-grade metasedimentary rock, primarily slate and phyllite
Depth to bedrock: 20 to 40 inches to hard bedrock (fig. 21)
Other distinctive properties: Soils subject to downslope movement when lateral support is removed and to differential settling when used as fill material; a high content of rock fragments; water movement along bedrock contacts

Minor Components

Dissimilar inclusions:
- Random areas of Soco and Stecoah soils that have fewer rock fragments in the soil and have soft bedrock at a depth of 20 to 60 inches
- Spivey soils that have thicker surface layers with more organic matter and have bedrock at a depth of more than 60 inches, in drainageways and below rock outcrops
- Santeetlah soils that have thicker surface layers with more organic matter and have bedrock at a depth of more than 60 inches, on benches, in concave areas at the head of drains, and on footslopes
- Tsali and Junaluska soils that have fewer rock fragments in the soil, more clay in the subsoil, and soft bedrock at a depth of 10 to 40 inches; on spur ridges

Figure 21.—Low-grade metasedimentary rock underlies soils such as Sylco and Cataska soils. This bedrock is unstable when lateral support is removed during the construction of roads.

- Random areas of soils that have hard bedrock at a depth of less than 20 inches
- Areas of rubble land below rock outcrops and in drainageways
- Random areas of soils on slopes of less than 50 percent or more than 95 percent
- Random areas where landslides have occurred
- Prominent ridges and upper side slopes that are subject to frequent rime ice in winter and damaging high winds year-round

Similar inclusions:
- Sylco and Cataska soils that have surface layers of sandy loam, fine sandy loam, or silt loam

Land Use

Dominant Uses: Wildlife habitat

Agricultural Development

Cropland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for crop production because of the slope, erodibility, high content of rock fragments, depth to bedrock, and extent of rock outcrops. A site should be selected on better suited soils.

Pasture and hayland
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for pasture and hay production because of the slope, erodibility, high content of rock fragments, depth to bedrock, and extent of rock outcrops. A site should be selected on better suited soils.

Orchard and ornamental crops
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for orchard and ornamental crops because of the slope, erodibility, high content of rock fragments, depth to bedrock, and extent of rock outcrops. A site should be selected on better suited soils.

Woodland Management and Productivity

Potential for commercial species: Very low
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for timber production because of the slope, low productivity, low volume, depth to bedrock, and extent of rock outcrops. A site should be selected on better suited soils.

Urban Development

Dwellings
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for dwellings because of the slope, erodibility, high content of rock fragments, depth to bedrock, and extent of rock outcrops. A site should be selected on better suited soils.

Septic tank absorption fields
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for septic tanks because of the slope, erodibility, high content of rock fragments, depth to bedrock, and extent of rock outcrops. A site should be selected on better suited soils.

Local roads and streets
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for roads and streets because of the slope, erodibility, high content of rock fragments, depth to bedrock, and extent of rock outcrops. A site should be selected on better suited soils.

Lawns and landscaping
Suitability: Unsuited
Management concerns:
- This map unit is severely limited for lawns and landscaping because of the slope, erodibility, high content of rock fragments, depth to bedrock, and extent of rock outcrops. A site should be selected on better suited soils.

Interpretive Groups

Land capability classification: 7s

ThB—Thurmont-Dillard complex, 2 to 8 percent slopes

Setting

Landscape: Valleys of intermountain hills and low mountains throughout the county
Elevation range: 1,480 to 4,630 feet
Landform: Low stream terraces and drainageways
Landform position: Concave to planar toeslopes

Shape of areas: Long and narrow
Size of areas: Up to 70 acres

Map Unit Composition

Thurmont soil and similar inclusions: 55 percent
Dillard soil and similar inclusions: 35 percent
Dissimilar inclusions: 10 percent

Typical Profile

Thurmont

Surface layer:
0 to 4 inches—dark yellowish brown loam

Subsoil:
4 to 35 inches—strong brown clay loam
35 to 42 inches—brownish yellow sandy clay loam
42 to 48 inches—brownish yellow sandy loam

Underlying material:
48 to 80 inches—pale brown loamy sand

Dillard

Surface layer:
0 to 9 inches—dark brown loam

Subsoil:
9 to 32 inches—yellowish brown clay loam with mottles in shades of red and brown
32 to 49 inches—yellowish brown loam with mottles in shades of brown and gray
49 to 53 inches—light brownish gray loam with mottles in shades of brown and yellow

Underlying material:
53 to 80 inches—light brownish gray loam with mottles in shades of brown and yellow

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Thurmont—well drained; Dillard—moderately well drained
General texture class: Loamy
Permeability: Thurmont—moderate; Dillard—moderately slow
Available water capacity: Moderate or high
Depth to seasonal high water table: Thurmont—3.0 to 6.0 feet from December through May and 3.5 to 6.0 feet from June through November; Dillard—2.0 to 3.0 feet from December through May and 2.0 to 3.5 feet from June through November
Hazard of flooding: None
Shrink-swell potential: Low
Slope class: Gently sloping
Soil slippage potential: None
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Moderate
Organic matter content of surface layer: Moderate or high
Potential for frost action: Moderate
Special climatic conditions: Soils subject to slow air drainage, which allows late spring and early fall frosts
Soil reaction: Thurmont—very strongly acid or strongly acid throughout, except in limed areas; Dillard—strongly acid or moderately acid in the A horizon, except in limed areas, and very strongly acid to moderately acid in the B and C horizons

Parent material: Colluvium and old alluvium derived from low-grade metasedimentary rock
Depth to bedrock: More than 60 inches
Other distinctive properties: Random areas of seeps and springs; soils subject to overland flow of storm water from adjacent uplands

Minor Components

Dissimilar inclusions:
- Soils that have surface layers with less organic matter and moderately eroded soils, in cropped fields
- Somewhat poorly drained Cullowhee soils that have subsoils that are loamy in the upper part and have strata with a high content of rock fragments at a depth of 20 to 40 inches, along stream channels
- Soils that are poorly drained, in areas of seeps and springs
- Random areas of soils on slopes of less than 2 percent or more than 8 percent
- Moderately well drained Dellwood and Reddies soils that are loamy in the upper part and have strata with a high content of rock fragments at a depth of 8 to 40 inches, along stream channels

Similar inclusions:
- Thurmont and Dillard soils that have surface layers of fine sandy loam or sandy clay loam

Land Use

Dominant Uses: Pasture and hayland
Other Uses: Cropland, building site development, and recreation

Agricultural Development

Cropland
Suitability: Well suited
Management concerns: Erodibility, tilth, pesticide retention, soil fertility, and climate
Management measures and considerations:
- Using conservation practices, such as contour farming, winter cover crops, and crop rotations which include grasses and legumes, helps to minimize soil erosion, maximize the infiltration of rainfall, increase the available water capacity, and improve soil fertility.
- Avoiding tillage during wet periods, incorporating crop residue into the soil, or leaving residue on the soil surface helps to minimize clodding and crusting and increases the infiltration of rainfall.
- These soils may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes crop productivity.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.

Pasture and hayland
Suitability: Well suited (fig. 22)
Management concerns: Erodibility, pesticide retention, and soil fertility
Management measures and considerations:
- Preparing seedbeds on the contour or across the slope helps to minimize soil erosion and increases germination.

Figure 22.—Hayland on colluvium on low stream terraces in an area of Thurmont-Dillard complex, 2 to 8 percent slopes.

- Growing adapted plants helps to ensure the production of high-quality forage and minimize soil erosion.
- Fencing livestock away from creeks and streams helps to prevent streambank erosion and sedimentation.
- These soils may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Using rotational grazing, implementing a well planned harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.

Orchard and ornamental crops

Suitability: Poorly suited

Management concerns: Thurmont—erodibility, climate, pesticide retention, root disease, and soil fertility; Dillard—erodibility, climate, pesticide retention, root disease, soil fertility, and wetness

Management measures and considerations:

- Establishing and maintaining sod between rows and on access roads helps to reduce the hazard of erosion.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.
- Because of the seasonal high water table, wetness, and the restricted movement of air and water due to the clay content of the subsoil, phytophthora root disease is a potential limitation for Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.

- These soils may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximize productivity.

Woodland Management and Productivity

Potential for commercial species: Moderately high for cove hardwoods and very high for eastern white pine
Suitability: Well suited
Management concerns: Erodibility and equipment use
Management measures and considerations:
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.
- When the soil is wet, skid trails and unsurfaced roads are highly erodible and very slick due to the slope, the high content of organic matter in the surface layer, and the clay content of the subsoil.
- Avoiding logging operations during periods when the soil is saturated helps to prevent rutting of the soil surface and damage to tree roots due to soil compaction.
- Leaving a buffer zone of trees and shrubs adjacent to streams helps to minimize siltation and provides shade for the aquatic habitat.
- Livestock should not be allowed to graze in areas managed for woodland.

Urban Development

Dwellings

Suitability: Poorly suited
Management concerns: Thurmont—erodibility, seeps and springs, and corrosivity; Dillard—erodibility, seeps and springs, corrosivity, wetness, and flooding
Management measures and considerations:
- An onsite investigation is needed to determine the suitability and limitations of any area within this map unit for dwellings.
- This map unit is difficult to manage for dwellings because of the seasonal high water table in the Dillard soil.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Installing a subsurface drainage system around foundations helps to intercept water from seeps and springs.
- Excavations may cut into seeps and springs. These areas should be avoided.
- Locating structures away from intermittent and perennial drainageways helps to minimize structural damage from overland flow of storm water.
- Using corrosion-resistant materials helps to reduce the risk of damage to uncoated steel and concrete.

Septic tank absorption fields

Suitability: Poorly suited
Management concerns: Thurmont—restricted permeability, seeps and springs, and slope; Dillard—restricted permeability, seeps and springs, slope, and wetness
Management measures and considerations:
- Contact the local Health Department for guidance on sanitary facilities.

- An onsite investigation is needed to determine the suitability and limitations of any area within this map unit for septic tank absorption fields.
- This map unit is difficult to manage for septic tank absorption fields because of the seasonal high water table in the Dillard soil.
- Excavations may cut into seeps and springs. These areas should be avoided.
- Raking trench walls helps to prevent the sealing of soil pores which may occur during the excavation of septic tank absorption fields.
- Installing distribution lines on the contour helps to improve the performance of septic tank absorption fields.

Local roads and streets
Suitability: Poorly suited
Management concerns: Thurmont—low strength, erodibility, seeps and springs, frost action, and large stones; Dillard—low strength, erodibility, seeps and springs, frost action, large stones, wetness, and flooding
Management measures and considerations:
- An onsite investigation is needed to determine the suitability and limitations of any area within this map unit for roads and streets.
- When the soil is wet, unsurfaced roads are highly erodible and very slick due the content of silt and clay in the subsoil.
- Incorporating sand and gravel into the soil, compacting roadbeds, and designing roads that conform to natural slopes help to improve soil strength.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- The permanent surfacing of roads or the use of suitable subgrade or base material allows the year-round use of roads and helps to reduce the damage from frost heaving.
- Intercepting and diverting underground water from seeps and springs helps to stabilize cut and fill slopes.

Lawns and landscaping
Suitability: Thurmont—well suited; Dillard—suited
Management concerns: Thurmont—erodibility, soil compaction, climate, pesticide retention, root disease, and soil fertility; Dillard—erodibility, soil compaction, climate, pesticide retention, root disease, soil fertility, and wetness
Management measures and considerations:
- Designing plantings on natural contours helps to increase water infiltration.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Because of the seasonal high water table, wetness, and the restricted movement of air and water due to the clay content of the subsoil, phytophthora root disease is a potential limitation for Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Using lime, fertilizer, mulch, and irrigation helps to establish lawns and landscape plants.
- Topsoil should be stockpiled from disturbed areas and replaced before landscaping.
- These soils may retain soil-applied herbicides and other pesticides due to the high content of organic matter in the surface layer. The concentration of pesticides may be damaging to landscape plants.
- Plant-applied pesticides may be more effective than soil-applied pesticides.

- Avoiding the use of heavy equipment in areas to be landscaped helps to prevent soil compaction.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.

Interpretive Groups

Land capability classification: Thurmont—2e; Dillard—2w

UdD—Udorthents-Urban land complex, 2 to 15 percent slopes

Setting

Landscape: Intermountain hills and low and intermediate mountains throughout the county
Elevation range: 1,080 to 3,500 feet
Landform: Ridges, hillslopes, mountain slopes, coves, stream terraces, and flood plains
Landform position: Summits, side slopes, footslopes, and toeslopes
Shape of areas: Irregular
Size of areas: Up to 109 acres

Map Unit Composition

Udorthents and similar inclusions: 50 percent
Urban land: 40 percent
Dissimilar inclusions: 10 percent

Typical Profile

Udorthents

Udorthents consists of cut and fill areas where soil and the underlying material have been removed and placed on an adjacent site. Areas include major highway right-of-way corridors, building sites, quarries, and recreational areas such as ball fields. A typical profile is not given due to the variable nature of the soil.

Urban land

Urban land consists of areas where 85 percent of the surface is covered with buildings, streets, parking lots, and other impervious material. The natural soils are paved over, covered, or greatly altered by cutting, filling, or grading during the process of urban development. The original landscape, topography, and, commonly, the drainage pattern have been changed. Runoff is very rapid and increases the hazard of flooding in low-lying areas. A typical profile is not given due to the variable nature of the soil.

Properties and Qualities of Udorthents

Note: Properties are variable and dependent on the type of fill material used or the type of rock exposed at the surface.

Depth class: Deep or very deep
Drainage class: Somewhat excessively drained or well drained
General texture class: Loamy
Permeability: Very rapid to slow
Available water capacity: Low or moderate
Depth to seasonal high water table: Variable; occasionally 3 to 6 feet and more commonly more than 6 feet from January through December

Hazard of flooding: Variable, commonly none or rare throughout the year with standing water for less than 2 days
Shrink-swell potential: Low
Slope class: Nearly level to strongly sloping
Soil slippage potential: Low
Extent of erosion: Slight to severe
Hazard of water erosion: Moderate to very severe
Rock fragments on the surface: Widely scattered cobbles and stones that are about 3 to 24 inches in length and about 25 to 75 feet apart
Organic matter content of surface layer: Low
Potential for frost action: Moderate
Soil reaction: Very strongly acid to moderately acid throughout the profile
Parent material: Loamy fill material
Depth to bedrock: Excavated areas—bedrock commonly exposed at or near the soil surface; fill areas—40 to more than 60 inches

Minor Components

Dissimilar inclusions:
- Areas that contain asphalt, wood, glass, and other waste material
- Areas of undisturbed soils around the edge of map unit delineations
- Areas that have bedrock at a depth of less than 40 inches
- Areas that have rock fragments, ranging from stones to boulders, on the soil surface
- Areas that are frequently, occasionally, or rarely flooded for very brief periods, along stream channels
- Random areas that are moderately well drained to poorly drained
- Random areas of soils on short, steep to nearly vertical slopes

Similar inclusions:
- Soils that are similar to Udorthents but have sandy or clayey underlying material

Land Use

An onsite investigation is needed to determine the suitability and limitations of any area within this map unit.

Interpretive Groups

Land capability classification: Udorthents—7e; Urban land—8s

UdE—Udorthents-Urban land complex, 15 to 95 percent slopes

Setting

Landscape: Intermountain hills and low and intermediate mountains throughout the county and high mountains along the Cherohala Skyway in the western part of the county
Elevation range: 1,280 to 4,720 feet
Landform: Ridges, hillslopes, mountain slopes, coves, stream terraces, and flood plains
Landform position: Summits, side slopes, footslopes, and toeslopes
Shape of areas: Irregular
Size of areas: Up to 30 acres

Map Unit Composition

Udorthents and similar inclusions: 45 percent

Urban land: 35 percent
Dissimilar inclusions: 20 percent

Typical Profile

Udorthents

Udorthents consists of cut and fill areas where soil and the underlying material have been removed and placed on an adjacent site. Areas include major highway right-of-way corridors, building sites, quarries, and recreational areas such as ball fields. A typical profile is not given due to the variable nature of the soil.

Urban land

Urban land consists of areas where 85 percent of the surface is covered with buildings, streets, parking lots, and other impervious material. The natural soils are paved over, covered, or greatly altered by cutting, filling, or grading during the process of urban development. The original landscape, topography, and, commonly, the drainage pattern have been changed. Runoff is very rapid and increases the hazard of flooding in low-lying areas. A typical profile is not given due to the variable nature of the soil.

Properties and Qualities of Udorthents

Note: Properties are variable and dependent on the type of fill material used or the type of rock exposed at the surface.

Depth class: Deep or very deep
Drainage class: Somewhat excessively drained to moderately well drained
General texture class: Loamy
Permeability: Very rapid to slow
Available water capacity: Low or moderate
Depth to seasonal high water table: Variable; occasionally 3 to 6 feet and more commonly more than 6 feet from January through December
Hazard of flooding: Variable, commonly none or rare throughout the year with standing water for less than 2 days
Shrink-swell potential: Low
Slope class: Moderately steep to very steep
Soil slippage potential: Medium
Extent of erosion: Slight to severe
Hazard of water erosion: Severe or very severe
Rock fragments on the surface: Widely scattered cobbles and stones that are about 3 to 24 inches in length and about 25 to 75 feet apart
Organic matter content of surface layer: Low
Potential for frost action: Moderate
Soil reaction: Very strongly acid to slightly alkaline throughout the profile
Parent material: Loamy fill material
Depth to bedrock: Excavated areas—bedrock commonly exposed at or near the soil surface; fill areas—40 to more than 60 inches
Other distinctive properties: Soils subject to downslope movement when lateral support is removed and to differential settling

Minor Components

Dissimilar inclusions:
- Areas that contain asphalt, wood, glass, and other waste material
- Areas of undisturbed soils around the edge of map unit delineations
- Areas that have bedrock at a depth of less than 40 inches
- Areas that have boulders on the soil surface

- Areas that are occasionally or rarely flooded for very brief periods, along stream channels
- Random areas of soils that are moderately well drained to poorly drained
- Random areas of short, very steep to nearly vertical slopes

Similar inclusions:
- Soils that are similar to Udorthents but have sandy or clayey underlying material

Land Use

An onsite investigation is needed to determine the suitability and limitations of any area within this map unit.

Interpretive Groups

Land capability classification: Udorthents—7e; Urban land—8s

UnB—Unison loam, 2 to 8 percent slopes

Setting

Landscape: Mountain valleys of low mountains and intermountain hills, dominantly along Tallulah, Sweetwater, and Dry Creeks, in the central and northeastern parts of the county
Elevation range: 1,930 to 3,000 feet
Landform: Coves and high stream terraces
Landform position: Footslopes, toeslopes, and benches
Shape of areas: Long and narrow or irregular
Size of areas: Up to 179 acres

Map Unit Composition

Unison soil and similar inclusions: 90 percent
Dissimilar inclusions: 10 percent

Typical Profile

Surface layer:
0 to 9 inches—brown loam

Subsoil:
9 to 22 inches—strong brown gravelly clay loam
22 to 40 inches—strong brown gravelly clay
40 to 80 inches—strong brown very gravelly clay loam

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
General texture class: Clayey
Permeability: Moderate
Available water capacity: High
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Moderate
Slope class: Gently sloping
Soil slippage potential: None
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Moderate

Organic matter content of surface layer: Moderate or high
Potential for frost action: Moderate
Special climatic conditions: Soil subject to slow air drainage, which allows late spring and early fall frosts
Soil reaction: Very strongly acid to moderately acid in the A and B horizons and strongly acid to neutral in the underlying material
Parent material: Old alluvium and colluvium derived from low-grade metasedimentary rock
Depth to bedrock: More than 60 inches
Other distinctive properties: A high content of clay in the subsoil; random areas of seeps and springs; soil subject to overland flow of storm water from adjacent uplands

Minor Components

Dissimilar inclusions:
- Soils that are moderately eroded, in cropped fields
- Random areas of Thurmont soils that have less clay in the subsoil
- Moderately well drained to poorly drained soils in depressions and on toeslopes
- Somewhat poorly drained Cullowhee soils that are loamy in the upper part and have strata with a high content of rock fragments at a depth of 20 to 40 inches, along stream channels
- Udorthents, loamy, or Urban land in and around Robbinsville
- Random areas of soils on slopes of less than 2 percent or more than 8 percent

Similar inclusions:
- Unison soils that have surface layers of fine sandy loam, silt loam, or sandy clay loam
- Unison soils that have more organic matter in the surface layer

Land Use

Dominant Uses: Cropland, pasture, and hayland
Other Uses: Building site development

Agricultural Development

Cropland

Suitability: Well suited
Management concerns: Erodibility, tilth, root penetration, pesticide retention, soil fertility, and climate
Management measures and considerations:
- Using conservation practices, such as contour farming, winter cover crops, and crop rotations which include grasses and legumes, helps to minimize soil erosion, maximize the infiltration of rainfall, increase the available water capacity, and improve soil fertility.
- Avoiding tillage during wet periods, incorporating crop residue into the soil, or leaving residue on the soil surface helps to minimize clodding and crusting and increases the infiltration of rainfall.
- Chisel plowing and subsoiling help to break through claypans, allowing increases in root penetration and rainfall infiltration.
- Using perennial grasses and legumes in rotation helps to penetrate and break up the clayey root zone.
- This soil may retain soil-applied herbicides and other pesticides because of the high clay content. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides, which become tied up by the high clay content.

- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes crop productivity.
- Applying large granules or banding of phosphorus helps to overcome phosphorus fixation.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.

Pasture and hayland
Suitability: Well suited
Management concerns: Erodibility, root penetration, pesticide retention, and soil fertility
Management measures and considerations:
- Preparing seedbeds on the contour or across the slope helps to minimize soil erosion and increases germination.
- Fencing livestock away from creeks and streams helps to prevent streambank erosion and sedimentation.
- Using perennial grasses and legumes helps to penetrate and break up the clayey root zone.
- This soil may retain soil-applied herbicides and other pesticides because of the high clay content. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides, which become tied up by the high clay content.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Applying large granules or banding of phosphorus helps to overcome phosphorus fixation.
- Using rotational grazing, implementing a well planned harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.

Orchard and ornamental crops
Suitability: Orchards—well suited; ornamentals—suited
Management concerns: Erodibility, root disease, climate, ball and burlap harvesting, pesticide retention, and soil fertility
Management measures and considerations:
- Establishing and maintaining sod between rows and on access roads helps to reduce the hazard of erosion.
- Because of the restricted movement of air and water due to the high clay content of the subsoil, phytophthora root disease is a severe limitation for Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.
- Avoiding ball and burlap harvesting during extreme moisture conditions helps to prevent fracture or deformation of the ball and tearing of plant roots.
- This soil may retain soil-applied herbicides and other pesticides because of the high clay content. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides, which become tied up by the high clay content.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximize productivity.
- Applying large granules or banding of phosphorus helps to overcome phosphorus fixation.

Woodland Management and Productivity

Potential for commercial species: High for cove hardwoods and eastern white pine
Suitability: Well suited
Management concerns: Erodibility and equipment use
Management measures and considerations:
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
- Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.
- Because of the high content of clay, revegetating cut and fill slopes can be difficult.
- When the soil is wet, skid trails and unsurfaced roads are highly erodible and very slick due to the clay content of the subsoil.
- Avoiding logging operations during periods when the soil is saturated helps to prevent rutting of the soil surface and damage to tree roots due to soil compaction.
- Livestock should not be allowed to graze in areas managed for woodland.
- Soil-applied herbicides are retained due to herbicide-clay bonding, which may damage tree seedlings when cropland is converted to woodland.

Urban Development

Dwellings
Suitability: Well suited
Management concerns: Erodibility, high clay content, shrink-swell potential, corrosivity, seeps and springs, and large stones
Management measures and considerations:
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Because of the high content of clay, revegetating cut and fill slopes can be difficult.
- The soil is slippery and sticky when wet and slow to dry.
- Reinforcing foundations and footings or backfilling with coarse textured material helps to strengthen buildings and prevents damage caused by shrinking and swelling.
- Using corrosion-resistant materials helps to reduce the risk of damage to uncoated steel and concrete.
- Installing a subsurface drainage system around foundations helps to intercept water from seeps and springs.
- Locating structures away from intermittent and perennial drainageways helps to minimize structural damage from overland flow of storm water.
- Large stones may be encountered during excavation.

Septic tank absorption fields
Suitability: Suited
Management concerns: Restricted permeability, high clay content, seeps and springs, and large stones
Management measures and considerations:
- Contact the local Health Department for guidance on sanitary facilities.
- Avoiding the installation of septic system distribution lines during wet periods helps to minimize the smearing and sealing of trench walls.
- Raking trench walls helps to prevent the sealing of soil pores which may occur during the excavation of septic tank absorption fields.
- Excavations may cut into seeps and springs. These areas should be avoided.
- Large stones may be encountered during excavation.

Local roads and streets

Suitability: Well suited

Management concerns: Low strength, high clay content, erodibility, frost action, and seeps and springs

Management measures and considerations:

- Incorporating sand and gravel into the soil, compacting roadbeds, and designing roads that conform to natural slopes help to improve soil strength.
- Using a nondegradeable, permeable fabric filter cloth between the roadbed and the soil surface helps to restrict the loss of stone into the soil.
- The soil is slippery and sticky when wet and slow to dry.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Because of the high content of clay, revegetating cut and fill slopes can be difficult.
- The permanent surfacing of roads or the use of suitable subgrade or base material increases soil strength, allows the year-round use of roads, and helps to reduce the damage from frost heaving.
- Intercepting and diverting underground water from seeps and springs helps to stabilize cut and fill slopes.

Lawns and landscaping

Suitability: Suited

Management concerns: Erodibility, high clay content, soil compaction, root disease, pesticide retention, climate, and soil fertility

Management measures and considerations:

- Designing plantings on natural contours helps to increase water infiltration.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Because of the high content of clay, revegetating cut and fill slopes can be difficult.
- The soil is slippery and sticky when wet and slow to dry.
- Avoiding the use of heavy equipment in areas to be landscaped helps to prevent soil compaction.
- Because of the restricted movement of air and water due to the high clay content of the subsoil, phytophthora root disease is a severe limitation for Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- This soil may retain soil-applied herbicides and other pesticides due to the high content of clay. The concentration of pesticides may be damaging to landscape plants.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.
- Using lime, fertilizer, mulch, and irrigation helps to establish lawns and landscape plants.
- Applying large granules or banding of phosphorus helps to overcome phosphorus fixation.
- Topsoil should be stockpiled from disturbed areas and replaced before landscaping.

Interpretive Groups

Land capability classification: 2e

UnC—Unison loam, 8 to 15 percent slopes

Setting

Landscape: Mountain valleys of low mountains and intermountain hills, dominantly along Tallulah, Sweetwater, and Dry Creeks, in the central and northeastern parts of the county
Elevation range: 1,810 to 2,260 feet
Landform: Coves and high stream terraces
Landform position: Footslopes, toeslopes, and benches
Shape of areas: Long and narrow or irregular
Size of areas: Up to 17 acres

Map Unit Composition

Unison soil and similar inclusions: 80 percent
Dissimilar inclusions: 20 percent

Typical Profile

Surface layer:
0 to 9 inches—brown loam

Subsoil:
9 to 22 inches—strong brown gravelly clay loam
22 to 40 inches—strong brown gravelly clay
40 to 80 inches—strong brown very gravelly clay loam

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
General texture class: Clayey
Permeability: Moderate
Available water capacity: High
Depth to seasonal high water table: More than 6.0 feet
Hazard of flooding: None
Shrink-swell potential: Moderate
Slope class: Strongly sloping
Soil slippage potential: None
Extent of erosion: Slight, less than 25 percent of the original surface layer has been removed
Hazard of water erosion: Severe
Organic matter content of surface layer: Moderate or high
Potential for frost action: Moderate
Special climatic conditions: Soil subject to slow air drainage, which allows late spring and early fall frosts
Soil reaction: Very strongly acid to moderately acid in the A and B horizons and strongly acid to neutral in the underlying material
Parent material: Old alluvium and colluvium derived from low-grade metasedimentary rock
Depth to bedrock: More than 60 inches
Other distinctive properties: A high content of clay in the subsoil; random areas of seeps and springs; soil subject to overland flow of storm water from adjacent uplands

Minor Components

Dissimilar inclusions:
- Soils that are moderately eroded, in cropped fields
- Random areas of Thurmont soils that have less clay in the subsoil
- Moderately well drained to poorly drained soils in depressions and on toeslopes
- Udorthents, loamy, or Urban land in and around Robbinsville
- Random areas of soils on slopes of less than 8 percent or more than 15 percent
- Somewhat poorly drained Cullowhee soils that are loamy in the upper part and have strata with a high content of rock fragments at a depth of 0 to 40 inches, along stream channels

Similar inclusions:
- Unison soils that have surface layers of fine sandy loam, silt loam, or sandy clay loam
- Unison soils that have more organic matter in the surface layer

Land Use

Dominant Uses: Cropland, pasture, and hayland
Other Uses: Building site development

Agricultural Development

Cropland
Suitability: Suited
Management concerns: Erodibility, equipment use, tilth, root penetration, pesticide retention, soil fertility, and climate
Management measures and considerations:
- Using conservation practices, such as contour farming, winter cover crops, and crop rotations which include grasses and legumes, helps to minimize soil erosion, maximize the infiltration of rainfall, increase the available water capacity, and improve soil fertility.
- The slope may limit equipment use in the steeper areas.
- Avoiding tillage during wet periods, incorporating crop residue into the soil, or leaving residue on the soil surface helps to minimize clodding and crusting and increases the infiltration of rainfall.
- Chisel plowing and subsoiling help to break through claypans, allowing increases in root penetration and rainfall infiltration.
- Using perennial grasses and legumes in rotation helps to penetrate and break up the clayey root zone.
- This soil may retain soil-applied herbicides and other pesticides because of the high clay content. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides, which become tied up by the high clay content.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes crop productivity.
- Applying large granules or banding of phosphorus helps to overcome phosphorus fixation.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.

Pasture and hayland
Suitability: Well suited
Management concerns: Equipment use, erodibility, root penetration, pesticide retention, and soil fertility

Management measures and considerations:
- The slope may limit the use of equipment in the steeper areas when harvesting hay crops.
- Using perennial grasses and legumes helps to penetrate and break up the clayey root zone.
- Preparing seedbeds on the contour or across the slope helps to minimize soil erosion and increases germination.
- This soil may retain soil-applied herbicides and other pesticides because of the high clay content. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides, which become tied up by the high clay content.
- Fencing livestock away from creeks and streams helps to prevent streambank erosion and sedimentation.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.
- Applying large granules or banding of phosphorus helps to overcome phosphorus fixation.
- Using rotational grazing, implementing a well planned harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity.

Orchard and ornamental crops
Suitability: Orchards—well suited; ornamentals—suited
Management concerns: Erodibility, equipment use, root disease, climate, ball and burlap harvesting, pesticide retention, and soil fertility
Management measures and considerations:
- Establishing and maintaining sod between rows and on access roads helps to reduce the hazard of erosion.
- The slope may limit equipment use in the steeper areas.
- Because of the restricted movement of air and water due to the high clay content of the subsoil, phytophthora root disease is a severe limitation for Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.
- Avoiding ball and burlap harvesting during extreme moisture conditions helps to prevent fracture or deformation of the ball and tearing of plant roots.
- This soil may retain soil-applied herbicides and other pesticides because of the high clay content. The concentration of pesticides may be damaging to future crops.
- Plant-applied pesticides may be more effective than soil-applied pesticides, which become tied up by the high clay content.
- Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximize productivity.
- Applying large granules or banding of phosphorus helps to overcome phosphorus fixation.

Woodland Management and Productivity

Potential for commercial species: High for cove hardwoods and eastern white pine
Suitability: Well suited
Management concerns: Erodibility and equipment use

Management measures and considerations:
• Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
• Avoiding the diversion of water directly onto fill slopes helps to stabilize logging roads, skid trails, and landings.
• Reseeding all disturbed areas with adapted grasses and legumes helps to prevent soil erosion.
• Because of the high content of clay, revegetating cut and fill slopes can be difficult.
• When the soil is wet, skid trails and unsurfaced roads are highly erodible and very slick due to the clay content of the subsoil.
• Avoiding logging operations during periods when the soil is saturated helps to prevent rutting of the soil surface and damage to tree roots due to soil compaction.
• Livestock should not be allowed to graze in areas managed for woodland.
• Soil-applied herbicides are retained due to herbicide-clay bonding, which may damage tree seedlings when cropland is converted to woodland.

Urban Development

Dwellings

Suitability: Suited
Management concerns: Slope, erodibility, shrink-swell potential, high clay content, corrosivity, seeps and springs, and large stones
Management measures and considerations:
• Designing structures so that they conform with natural slopes helps to improve soil performance.
• Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
• Because of the high content of clay, revegetating cut and fill slopes can be difficult.
• The soil is slippery and sticky when wet and slow to dry.
• Reinforcing foundations and footings or backfilling with coarse textured material helps to strengthen buildings and prevents damage caused by shrinking and swelling.
• Using corrosion-resistant materials helps to reduce the risk of damage to uncoated steel and concrete.
• Installing a subsurface drainage system around foundations helps to intercept water from seeps and springs.
• Locating structures away from intermittent and perennial drainageways helps to minimize structural damage from overland flow of storm water.
• Large stones and boulders may be encountered during excavation.

Septic tank absorption fields

Suitability: Suited
Management concerns: Restricted permeability, high clay content, slope, seeps and springs, and large stones
Management measures and considerations:
• Contact the local Health Department for guidance on sanitary facilities.
• Avoiding the installation of septic system distribution lines during wet periods helps to minimize the smearing and sealing of trench walls.
• Raking trench walls helps to prevent the sealing of soil pores which may occur during the excavation of septic tank absorption fields.
• Installing distribution lines on the contour helps to improve the performance of septic tank absorption fields.
• Excavations may cut into seeps and springs. These areas should be avoided.
• Large stones and boulders may be encountered during excavation.

Local roads and streets

Suitability: Suited

Management concerns: Low strength, high clay content, slope, erodibility, frost action, and seeps and springs

Management measures and considerations:

- Incorporating sand and gravel into the soil, compacting roadbeds, and designing roads that conform to natural slopes help to improve soil strength.
- Using a nondegradeable, permeable fabric filter cloth between the roadbed and the soil surface helps to restrict the loss of stone into the soil.
- The soil is slippery and sticky when wet and slow to dry.
- Designing roads on the contour and installing water-control structures, such as broad-based dips, water bars, and culverts, help to maintain road stability.
- Avoiding the diversion of water directly onto fill slopes and vegetating cut and fill slopes as soon as possible help to prevent soil slippage and excessive soil erosion.
- Because of the high content of clay, revegetating cut and fill slopes can be difficult.
- The permanent surfacing of roads or the use of suitable subgrade or base material increases soil strength, allows the year-round use of roads, and helps to reduce the damage from frost heaving.
- Intercepting and diverting underground water from seeps and springs helps to stabilize cut and fill slopes.

Lawns and landscaping

Suitability: Suited

Management concerns: Slope, erodibility, high clay content, soil compaction, root disease, pesticide retention, climate, and soil fertility

Management measures and considerations:

- Designing plantings on natural contours helps to increase water infiltration.
- Vegetating cleared and graded areas as soon as possible and using erosion-control structures, such as silt fences and catch basins, help to maintain soil stability and prevent sediments from leaving the site.
- Because of the high content of clay, revegetating cut and fill slopes can be difficult.
- The soil is slippery and sticky when wet and slow to dry.
- Avoiding the use of heavy equipment in areas to be landscaped helps to prevent soil compaction.
- Because of the restricted movement of air and water due to the high clay content of the subsoil, phytophthora root disease is a severe limitation for Fraser fir and other susceptible ornamentals.
- In areas where water concentrates, such as drainageways, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided.
- This soil may retain soil-applied herbicides and other pesticides due to the high content of clay. The concentration of pesticides may be damaging to landscape plants.
- Because of slow air drainage and frost pockets, late spring frost may damage new growth in some years.
- Using lime, fertilizer, mulch, and irrigation helps to establish lawns and landscape plants.
- Applying large granules or banding of phosphorus helps to overcome phosphorus fixation.
- Topsoil should be stockpiled from disturbed areas and replaced before landscaping.

Interpretive Groups

Land capability classification: 3e

UoA—Udorthents-Urban land complex, 0 to 5 percent slopes, rarely flooded

Setting

Landscape: Mountain valleys, dominantly along Tallulah and Long Creeks near Robbinsville
Elevation range: 1,740 to 2,450 feet
Landform: Stream terraces and flood plains
Landform position: Toeslopes and bottomland
Shape of areas: Irregular
Size of areas: Up to 338 acres

Map Unit Composition

Udorthents and similar inclusions: 60 percent
Urban land: 30 percent
Dissimilar inclusions: 10 percent

Typical Profile

Udorthents

Udorthents consists of cut and fill areas where soil and the underlying material have been removed and placed on an adjacent site. Areas include highways, building sites, and recreational areas, such as parks, river access points, and campgrounds. Also included are depressions filled with construction debris and covered with soil material. A typical profile is not given due to the variable nature of the soil.

Urban land

Urban land consists of areas where 85 percent of the surface is covered with buildings, streets, parking lots, and other impervious material. The natural soils are paved over, covered, or greatly altered by cutting, filling, or grading during the process of urban development. The original landscape, topography, and, commonly, the drainage pattern have been changed. Runoff is very rapid and increases the hazard of flooding in low-lying areas. A typical profile is not given due to the variable nature of the soil.

Properties and Qualities of Udorthents

Note: Properties are variable and dependent on the type of fill material used or the type of rock exposed at the surface.

Depth class: Very deep
Drainage class: Somewhat excessively drained to moderately well drained
General texture class: Loamy
Permeability: Very rapid to slow
Available water capacity: Low or moderate
Depth to seasonal high water table: Variable; occasionally 3 to 6 feet and more commonly more than 6 feet from January through December
Hazard of flooding: Rare, throughout the year with standing water for less than 2 days
Shrink-swell potential: Low
Slope class: Nearly level or gently sloping
Soil slippage potential: None
Extent of erosion: None to moderate
Hazard of water erosion: Moderate to very severe
Organic matter content of surface layer: Low
Potential for frost action: Moderate

Soil reaction: Very strongly acid to slightly alkaline throughout the profile
Parent material: Loamy fill material
Depth to bedrock: 40 to more than 60 inches in fill areas
Other distinctive properties: Potential for differential settling; soils subject to overland flow of storm water from adjacent uplands

Minor Components

Dissimilar inclusions:
- Areas of undisturbed soils around the edge of map unit delineations
- Areas that have rock fragments, ranging from stones to boulders, on the soil surface
- Areas that are occasionally flooded for very brief periods, along stream channels
- Random areas of soils that are moderately well drained to poorly drained
- Random areas of short, steep to nearly vertical slopes

Similar inclusions:
- Soils that are similar to Udorthents but have sandy or clayey underlying material

Land Use

An onsite investigation is needed to determine the suitability and limitations of any area within this map unit.

Interpretive Groups

Land capability classification: Udorthents—7e; Urban land—8s

W—Water

This map unit consists of bodies of water, such as lakes, ponds, and borrow pits filled with water after mining operations have ceased. It also includes areas of wide perennial streams or rivers. No interpretations are given for this map unit.

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of the natural resources and the environment. Also, it can help to prevent soil-related failures in land use.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors which affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis for predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Generally, the soils in Graham County which are well suited to crops are also well suited to urban uses. The data concerning specific soils in the county can be used in planning future land use patterns. The potential for farming should be considered relative to any soil limitations and the potential for non-farm development.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Interpretive Ratings

The interpretive tables in this survey rate the soils in the survey area for various uses. Many of the tables identify the limitations that affect specified uses and indicate the severity of those limitations. The ratings in these tables are both verbal and numerical.

Rating Class Terms

Rating classes are expressed in the tables in terms that indicate the extent to which the soils are limited by all of the soil features that affect a specified use or in terms that indicate the suitability of the soils for the use. Thus, the tables may show limitation classes or suitability classes. Terms for the limitation classes are *not limited, slightly limited, somewhat limited,* and *very limited*. The suitability ratings are expressed as *well suited, moderately well suited, poorly suited,* and *unsuited* or as *good, fair,* and *poor*.

Numerical Ratings

Numerical ratings in the tables indicate the relative severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation. The limitations appear in order from the most limiting to the least limiting. Thus, if more than one limitation is identified, the most severe limitation is listed first and the least severe one is listed last.

Crops and Pasture

Glenn Carson, district conservationist in Graham County, Natural Resources Conservation Service, and Bobby Brock, agronomist (retired) and grassland management specialist, Natural Resources Conservation Service, helped prepare this section.

General management needed for crops and pasture is suggested in this section. In the following sections, the crops or pasture plants best suited to the soils are identified, the system of land capability classification used by the Natural Resources Conservation Service is explained, the estimated yields of the main crops and hay and pasture plants are listed for each soil, and prime farmland is described.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading “Detailed Soil Map Units” and in the tables. Specific information can be obtained from the local office of the Natural Resources Conservation Service, the Cooperative Extension Service, or the Graham Soil and Water Conservation District.

Federal and State regulations require that any area designated as wetlands cannot be altered without prior approval. Contact the local office of the Natural Resources Conservation Service for identification of hydric soils and potential wetlands.

Cropland

In 2007, according to the U.S. Census of Agriculture and the North Carolina Cooperative Extension Service of Graham County, the county had approximately 4,500 acres of cropland. The major crops grown in Graham County include tobacco (fig. 23), hay, grain, silage, sweet corn, landscaping ornamentals, and other vegetables, fruits, and berries. Cultivated lands occur on nearly level bottomland soils and gently sloping and strongly sloping terrace soils along the major tributaries of the Little Tennessee and Cheoah Rivers. Soils managed include Dellwood, Reddies, Statler, Dillard, Unison, and Braddock. Gently sloping and strongly sloping soils on intermountain hills and low mountains, such as Brasstown and Junaluska soils, and on terraces and in coves, such as Braddock, Dillard, Lonon, Thurmont, Statler, Unison, and Whiteoak soils, are farmed in the Robbinsville, Stecoah, Tallulah, and Tuskeegee communities. Other small areas of cultivated land are scattered throughout the county.

Ornamental crops are grown on intermediate and low mountains, on intermountain hills (in areas of Brasstown and Stecoah soils), in coves and on terraces (in areas of Lonon, Thurmont, Braddock, Santeetlah, and Unison soils), and on flood plains (in areas of Dellwood and Reddies soils). Mountain and cove soils in valleys in the central portion of the county are the major areas used for growing ornamental crops.

The following paragraphs discuss several points relative to soil quality. Improving soil quality can help to reduce the onsite and offsite costs of soil erosion, improve nutrient utilization, and ensure that the soil resource is sustained for future use. The soil’s physical, chemical, and biological properties must be at optimal levels for high yields to be maintained on a sustainable basis. More specific information can be obtained from the Natural Resources Conservation Service, the Graham Soil and Water Conservation District, and the North Carolina Cooperative Extension Service.

Figure 23.—Burley tobacco in an area of Spivey-Whiteoak complex, 8 to 15 percent slopes, bouldery. If surface fragments are removed, the Spivey and Whiteoak soils are capable of high crop yields when properly managed.

Erosion control.—Water erosion is a major concern on most of the soils used for cropland in Graham County. It is a hazard on soils that have slopes of more than 2 percent. As the length and steepness of slope increase, the hazard of erosion and the difficulty in controlling erosion also increase. Loss of the surface layer through erosion is damaging. Soil 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, such as Unison and Braddock soils, and on soils that have a layer in or below the subsoil that limits the depth of the root zone, such as Junaluska and Soco soils.

Erosion on farmland reduces soil productivity while the runoff pollutes streams, lakes, and reservoirs with sediment, agricultural chemicals, and nutrients. Controlling erosion improves the quality of water for municipal use, for recreation, and for fish and wildlife. Graham County's trout streams are especially sensitive to damage caused by runoff and sediment.

Erosion-control practices provide a protective surface cover, minimize runoff, and increase the rate of water infiltration. A cropping system that keeps a vegetative cover on the soil for extended periods helps to minimize soil loss and maintains the productive capacity of the soil. In sloping areas, including forage crops of grasses and legumes in the cropping system helps to control erosion. The forage crops also add nitrogen to the soil and improve tilth. Minimizing tillage and leaving crop residue on the surface increase the rate of water infiltration, minimize runoff, and help to control erosion. These practices can be effective on most of the soils in the survey area.

Other practices include the use of terraces or diversions to shorten the length of slopes and thus minimize erosion caused by runoff. Contour farming and stripcropping are also effective components of resource management systems. Stripcropping can include the use of crop rotations, crop residue management, contouring, conservation tillage, and cover crops. These methods are practical as they can be adapted to a wide

Figure 24.—A cropped field in an area of Reddies fine sandy loam, 0 to 3 percent slopes, occasionally flooded. Flooding damages crops, strips away valuable topsoil, and reduces the potential productivity of the soil.

range of slope patterns. Information about erosion-control measures for each kind of soil is available at the local office of the Natural Resources Conservation Service.

Water management.—Soils on bottomlands and low terraces are subject to flooding of varying frequency and duration. Fluvaquents are flooded frequently (the chance of flooding is greater than 50 percent in any year). Alarka, Cullowhee, Ela, Reddies, Dellwood, and Wesser soils are flooded occasionally (the chance of flooding is 5 to 50 percent in any year). Dillard, Statler, and Hemphill soils are rarely flooded (the chance of flooding is 0 to 5 percent in any year). Although the duration of flooding is very brief, lasting less than 2 days, the risk of crop loss due to flooding during the growing season is always a possibility on these soils.

All flood plain soils have a flooding hazard to some degree. Flooding can result from runoff from adjacent slopes or from streambank overflow. Excessive surface water due to floods can delay equipment use and damage crops and forages (fig. 24). Tillage patterns can increase the problem by creating low areas and blocking surface water outlets. Some soils, such as Reddies, flood occasionally but are commonly used for crops. Harvesting crops as soon as possible prevents the risk of damage from flooding. Diversions, land smoothing, and waterways are effective in removing the surface water runoff from adjacent slopes.

Cullowhee soils are on bottomlands and may require artificial drainage. Subsurface drainage tile is used to control the water table in these soils. Wet areas due to seeps and springs occur in Dillard, Thurmont, Lonon, Northcove, Spivey, Santeetlah, and Whiteoak soils. These soils are commonly identified on the soil map by a “wet spot” symbol. Subsurface drainage tile and surface ditching are methods used to control water in areas of these soils. Ela, Alarka, and Wesser soils are poorly drained and very poorly drained and are not recommended for cropland use.

Surface water management is important on cropland. Overland flow and runoff from adjacent land onto cultivated lands must be controlled. The movement of surface water across plowed fields needs to be controlled as well. Grassed waterways and diversions are measures that help to reduce surface water problems, such as soil erosion, and help to maintain water quality in adjacent waterways. Onsite investigations are essential to determine the proper method of control.

Federal and State regulations require that any area designated as wetlands cannot be altered without prior approval. Contact the local office of the Natural Resources Conservation Service for identification of hydric soils and potential wetlands.

Soil tilth.—Soils with good tilth have good aeration, a high rate of water infiltration, a good water-holding capacity, and low seedling mortality rates. Soil properties associated with good tilth are loamy surface textures and a moderate or high content of organic matter in the surface layer. Soils in Graham County on slopes of less than 3 percent commonly have better tilth than those on slopes of more than 4 percent. Steeper areas are more susceptible to erosion. Erosion results in surfaces layers with higher contents of clay, thus degrading tilth and overall soil quality.

Soil tilth is adversely affected by continuous cropping, lack of erosion control, excessive cultivation, and surface compaction from farm equipment, all of which result in the depletion of organic matter. Periods of heavy rainfall result in the formation of a crust on the soil surface. The crust is hard when dry and nearly impervious to water. It reduces the rate of water infiltration and increases the runoff rate. Regular additions of crop residue, manure, and other organic material can improve soil structure and prevent the formation of a crust.

Resource management systems, such as contour farming, conservation tillage, crop residue management, stripcropping, winter cover crops, and crop rotations which include grasses and legumes, help to minimize soil erosion, clodding, and crusting. These practices also help to increase the infiltration of rainfall, increase the amount of water available to plants, and improve soil fertility and tilth.

Because of crusting during winter and spring, fall plowing is generally not recommended. Many of the soils that are plowed in fall are almost as dense and hard at planting time as they were before they were plowed. More than 90 percent of the cropland in the survey area consists of sloping soils that are subject to erosion if plowed in the fall. Severely eroded spots in areas of clayey soils, such as Braddock, become cloddy if plowed outside a narrow range in moisture content. Fall plowing on these clayey soils generally results in better tilth in spring.

Some soils in the survey area have poor tilth because of gravel in the surface layer. These soils are in small, isolated areas along river bottoms and terraces. The content and size of the pebbles affect the use of tillage implements. Cobbles, flagstones, stones, and boulders are common in many of the colluvial soils in the survey area, especially in Lonon, Northcove, Santeetlah, Spivey, and Whiteoak soils. In some places the rock fragments prevent tillage. In other places they can be removed.

Soil fertility.—Generally, the soils in Graham County are low in natural fertility and are naturally acidic. Soil amendments of lime, fertilizer, and organic matter are needed for most kinds of crops and pasture plants.

Liming requirements are a major concern because the acidity level in the soil affects the availability of many plant nutrients, the activity of beneficial bacteria, and other components of the soil's biological community. Lime also neutralizes exchangeable aluminum. This counteracts the adverse effects of high levels of aluminum on many crops. Liming adds calcium (calcitic lime) or calcium and magnesium (dolomitic lime) to the soil. Incorporating lime into the soil before planting is important because lime moves slowly into the root zone when applied to the surface.

A soil test is used as a guide to indicate how much and what kind of lime and fertilizer should be used. For example, levels of magnesium and available calcium may be low in soils that have sandy surface layers. Depending on the soil properties and the crop to be grown, the desired pH levels may differ. Soil tests are needed to determine proper application rates.

Figure 25.—Proper management of pasture and hayland should include a soil analysis to indicate the amount and type of nutrients needed for optimum forage production.

Soil tests also determine the need for phosphorus and potassium fertilizer. These tests are important because, while natural occurring phosphorus and potassium levels are often very low, land in long-term agricultural use often has levels higher than expected of these nutrients. Phosphorous and potassium have a tendency to build up in the soil (fig. 25).

Nitrogen fertilizer is required for most crops. However, it is not required for clover, in some rotations of soybeans, or for alfalfa that is established. Appropriate rates depend on the crop and the potential productivity of the soil. For example, nitrogen rates for corn on soils that have a yield potential of 180 to 200 bushels per acre should be about 160 to 180 pounds per acre. Where the yield potential is only 100 bushels per acre, rates of about 100 to 120 pounds of nitrogen per acre should be used. Application of nitrogen in excess of potential yields is not a recommended practice. The excess fertilizer not utilized by the crop creates an unnecessary expense and can result in the pollution of surface water and ground water. Nitrogen can be readily leached from the more sandy soils, such as Reddies and Dellwood. As a result, split applications of nitrogen may be needed on these soils during the growing season.

Nitrogen rates can be reduced on fields using a continuous no-till system provided that the levels of organic matter have been increased substantially. This increase may be achieved with a minimum of 2 tons per acre of organic matter left on the surface annually in the absence of tillage. Both the experience of farmers and the results of research have shown sustained yields with reduced nitrogen rates.

Pest control.—Herbicides and other pesticides may be necessary for controlling weeds, harmful insects, and disease. They should be applied by banding or spot treatment where possible. Following label directions ensures that target organisms are controlled and that the contamination of soil, water, air, and nontarget organisms is minimized. Soil properties, such as the organic matter content and the clay content of the surface layer, affect the rate of soil-applied applications. Estimates for these properties were determined for the soils in this survey area. The thickness and texture of the soil layers is shown in the USDA texture column in **table 16**. **Table 17** shows the general range of clay content and organic matter content in the surface layer.

In some areas, the organic matter content of a soil may be outside the range shown in **table 17**. The content may be higher in soils that have received high amounts of animal or manmade waste. Soils that have recently been brought into cultivation (through pasture conversion) may have a higher organic matter content in the surface layer than similar soils that have been cultivated (through cropland conversion). Lower levels of organic matter are common in soils where the surface layer has been partly or completely removed by erosion, land smoothing, or other activities such as woodland clearing.

Soils such as Snowbird, Cheoah, Hemphill, Santeetlah, Whiteoak, Dellwood, and Reddies have enough organic matter in the surface layer to inhibit the activity of some soil-applied pesticides. Current soil tests should be used to measure the organic matter (humic) content before soil-applied rates are determined. Refer to the label of the pesticide container for further instructions. Eroded soils such as Braddock may have enough clay in the surface layer to bind pesticides.

The wet conditions of soils such as Ela, Alarka, Wesser, and Cullowhee and areas with seeps and springs may reduce the effectiveness of pesticides and lead to the contamination of surface water and ground water. In saturated soils and areas with excess surface water from prolonged rains or irrigation, herbicides and other pesticides can be carried to surface waters. The contamination of surface water and ground water is also a concern for Dellwood and Reddies soils due to a high leaching rate caused by low clay content. **Table 19** shows depth to water table and flooding frequency for soils in the survey area.

Erosion-control practices, such as maintaining permanent ground cover and establishing grassed filter strips in drainageways and field borders, help to minimize soil loss and runoff that can carry absorbed or dissolved herbicides and other pesticides to surface waters. Utilizing weather forecasts and scheduling irrigation so that it does not conflict with herbicide and pesticide use help to reduce contamination problems.

The pesticide product labels show specific application rates based on the organic matter content and clay content of the soil. The “Detailed Soil Map Units” section provides information on map unit composition, soil properties and behavior, and management concerns and considerations.

Using integrated pest management programs helps to avoid unnecessary pesticide applications. Crops are scouted to determine if pests are present and then monitored to determine when populations require control in order to prevent economic loss. This allows for the timeliest, and thus the most cost-effective, use of the pesticide.

Other methods of weed, pest, and disease control include the use of goats, biological agents, mulching, mowing, and hand weeding. These viable alternatives can be used alone or in combination with chemical control. The latest information on these types of control can be obtained at the local office of the North Carolina Cooperative Extension Service, the Graham Soil and Water Conservation District, or the Natural Resources Conservation Service.

Soil biological improvements.—The “soil food web,” or biological community, is the living component of soil. Soil is a living system. Optimum soil quality and productivity cannot be achieved unless the soil supports a diverse, strongly active biological community. A single handful of healthy soil contains more individual microbes, bacteria, fungi, protozoa, beneficial nematodes, micro-arthropods, and larger animals such as earthworms than the number of people on all the earth. These soil organisms support plant health as they decompose organic matter, cycle nutrients, and control soil organisms considered crop pests. They also decompose or fix pesticides and nutrients that might otherwise enter water and become pollutants. Many organisms enhance soil aggregation and porosity (soil structure), thus increasing infiltration rates and reducing runoff rates.

Figure 26.—Differences in soil properties can occur within short distances in the same field. Pictured are fine-loamy Statler soils (foreground) and clayey Braddock soils (background) under hayland management.

Organic matter is the key to the biological health of soil. It serves as the food source for the numerous types of beneficial soil organisms. Biological improvements require additions of organic matter, reduction in tillage, and more careful selection and application of fertilizers and pesticides. These improvements will in turn support a growing population of soil organisms that steadily enhance the soil's physical and chemical properties and support plant health. As a result, agricultural productivity and air and water quality are improved.

Pasture and Hayland

In 2007, according to the U.S. Census of Agriculture and the North Carolina Cooperative Extension Service of Graham County, the county had approximately 7,300 acres of pasture and 800 acres of hayland.

A successful livestock enterprise depends on a forage program that provides large quantities of good-quality feed. In most areas of pasture and hayland in Graham County, renovation, brush control, and measures that prevent overgrazing are needed. The soils in the survey area vary widely in their ability to produce grasses and legumes because of differences in such properties as depth to bedrock or sand and gravel strata, internal drainage, and available water-holding capacity. Great differences in soil properties can occur within short distances and commonly within the same field (fig. 26). For example, wet bottomland soils, such as Cullowhee, commonly join steeper, well drained terrace and upland soils, such as Unison and Brasstown.

Some pastures on steeper side slopes include eroded areas, such as on Brasstown and Junaluska soils. These areas have cow paths, known as catsteps, on the contour that support very little forage. The rooting depth and available water-holding capacity are limited in these areas due to overgrazing, compaction, and erosion. These areas are easily susceptible to drought and further erosion.

Pastures on high mountain ridges and steep side slopes above 4,000 feet in elevation are subject to extreme winter conditions, especially on north-facing slopes. Pastures on these landscapes can be damaged by frost heave and late fall grazing, which does not allow forage plants time to recover before winter dormancy. They also have a shorter growing season and receive more precipitation than pastures at lower elevations. These weather conditions make pasture establishment and maintenance more difficult.

Pastures tend to be more productive on uneroded side slopes and ridgetops where slopes are less than 30 percent, such as in areas of Brasstown, Junaluska, Stecoah, and Soco soils. Braddock soils, although eroded, can support good pastures in areas that do not have compacted cow trails because of their relatively higher natural fertility. Cove soils, such as Santeetlah and Whiteoak, support good pastures because of the high content of organic matter in the surface layer and the high available water-holding capacity of the subsoil.

Soil fertility.—In Graham County, the soils are not naturally fertile enough to produce hay and forage crops without soil amendments. This is due to naturally low levels of nutrients in the soil and an acidic soil environment. By decreasing soil acidity with applications of lime, the availability of nutrients and the activity of beneficial bacteria increase. Lime also neutralizes exchangeable aluminum, thus reducing aluminum toxicity to crops. Incorporating lime into the soil before planting is important because lime moves slowly into the root zone when applied to the surface. Both organic and chemical fertilizers increase nutrient levels in the soil. Because soils in the survey area are naturally low in nitrogen and phosphorus, optimum forage growth typically requires that lime be applied at a lower rate and with less regularity. A soil test is recommended, however, to determine proper application rates of lime and fertilizer. Other considerations are cropping history and the hay or forage crop to be planted or maintained.

Timing of fertilizer application is very important in achieving maximum yields. A general guideline for cool-season forage is to fertilize at or just before periods of early growth. Depending on elevation, aspect, and the weather, fertilizer should be applied between late February and late March before spring growth occurs and between mid-August and mid-September before fall growth occurs.

Pest control.—Herbicides and other pesticides may be necessary for controlling weeds and harmful insects in the production of forage crops. The organic matter content and clay content of the surface layer and the depth to a water table affect the amount and frequency of soil-applied herbicide and other pesticides. Soils such as Cheoah, Snowbird, Spivey, Santeetlah, Dellwood, and Reddies have enough organic matter in the surface layer to inhibit the activity of soil-applied pesticides. Eroded soils such as Braddock may have enough clay in the surface layer to bind up pesticides.

Under the wet conditions of Hemphill and Cullowhee soils and in areas with seeps and springs, the effectiveness of soil-applied pesticides may be reduced and surface water and ground water may become contaminated. On saturated soils and in areas with excess surface water from prolonged rains or irrigation, herbicides and other pesticides can be carried to surface waters. The contamination of surface water and ground water is also a concern for Dellwood and Reddies soils due to a high leaching rate caused by the low clay content. **Table 19** shows the depth to water table and flooding frequency for soils in the survey area.

Using integrated pest management programs avoids unnecessary pesticide applications. Crops are scouted to determine if pests are present and then monitored to determine when populations require control in order to prevent economic loss. This allows for the timeliest, and thus the most cost-effective, use of the pesticide.

Other methods of weed control include the use of goats, biological agents, and mowing. These viable alternatives can be used alone or in combination with chemical weed control. The latest information on these types of weed control can be obtained at the local office of the North Carolina Cooperative Extension Service, the Graham Soil and Water Conservation District, or the Natural Resources Conservation Service.

Species.—The intended use should be considered when forage species are selected. The selected species should provide maximum quality and versatility in the forage program. Legumes generally produce higher quality feed than grasses. They should be grown to the maximum extent possible. The taller legumes, such as alfalfa and red clover, are more versatile than legumes that are used primarily for grazing, such as white clover. Orchardgrass, timothy, and tall fescue are well suited grasses.

The forage species selected for planting should be appropriate for the soil. Deep and very deep, well drained soils should be planted to the highest-producing crops, such as alfalfa or a mixture of alfalfa and orchardgrass or alfalfa and timothy. Sod-forming grasses, such as tall fescue and orchardgrass, minimize erosion in the steeper areas. Alfalfa should be seeded with cool-season grasses in areas where the soil is at least 2 feet deep and is well drained. Stecoah, Brasstown, Braddock, Unison, and Lonon soils are examples. Alfalfa does poorly on wet soils, such as Cullowhee and Ela. The more poorly drained soils and the soils that are less than 2 feet deep are suited to clover-grass mixtures or to pure stands of clover or grasses. Legumes can be established through renovation in areas that support sod-forming grasses.

Tall fescue is an important cool-season grass and thrives on soils well suited to both pasture and hay. It can also be established and perform very well on soils with high water tables or clayey subsoils and in eroded areas. Fescue is an excellent companion crop for legumes in pasture mixtures, such as ladino clover or red clover. Seeding a legume with fescue is a good practice in Graham County. In many pastures, there is an abundant supply of native White Dutch clover seed in the soil and additional seeding is not necessary. The legume adds to the palatability and nutritive value of the grass and decreases the need for nitrogen fertilizer. For maximum production, nitrogen fertilizer should be applied during the period when the grass is accumulating. Care must be taken to minimize the effects of fescue toxicity caused by the fungus *Acremonium coenophialum*, which occurs on fescue plants. This fungus greatly reduces animal health and performance.

Warm-season grasses that are planted during the period from early April through late May help to supplement cool-season grasses, such as tall fescue. They grow well during warm periods, especially from mid-June through September, when the growth of cool-season grasses is slow. Examples of warm-season grasses are switchgrass, big bluestem, eastern gamagrass, indiangrass, and Caucasian bluestem. Annual summer grasses, such as sudangrass, pearl millet, and sorghum, can be valuable in providing silage and hay in a forage program. Cattle producers can use these grasses for summer forage when cool-season grasses become dormant.

Pastures of native bluegrass are on most soils in the county and provide desired forage for horses and sheep. Bluegrass pastures could be improved by the use of high-analysis phosphate fertilizers, which encourage the growth of native White Dutch clover and increase the nutrition and quality of forage.

Orchardgrass, another important species, can grow anywhere that fescue thrives, except in wet areas, such as on Cullowhee and Ela soils. Orchardgrass has requirements similar to those of fescue but is more sensitive to overgrazing and weed competition. Rotational grazing helps to extend the life of this species. Orchardgrass is not infected by fescue fungus.

Erosion control.—The majority of pasture and hayland in Graham County is in areas too steep or wet to row crop. This can lead to a variety of erosion problems. For instance, severe streambank erosion and downstream sedimentation occur where livestock travel streambanks. Trout streams are particularly vulnerable to damage by sedimentation. Pasture rotation helps to prevent erosion. Fencing cattle away from streams and installing watering systems which utilize springs and wells help to prevent overgrazing.

Pastures on slopes of more than 30 percent are generally too steep for farm equipment. Lime and fertilizer must be applied by hand, or access roads must be built for farm equipment. Hand applications of fertilizer and lime are usually uneven and result in poor stands of pasture, which support fewer cattle. Poor vegetative cover encourages erosion, the growth of unwanted weeds, and the encroachment of shrubs and trees into field borders. Where access roads are not economically feasible or hand applications of lime and fertilizer are not performed regularly, timber production may bring a greater economic return.

The establishment and rejuvenation of pasture may create erosion problems where slopes are more than 2 percent. Using proper planting dates helps to ensure a good stand in a timely manner. Alfalfa and cool-season forages, such as fescue, orchardgrass, clovers, and bluegrass, should be planted between mid-March and mid-April for best results. Warm-season forages, such as sudangrass, should be planted between mid-March and mid-April, when the danger of frost is past, for best results.

Maintenance of pasture and hayland.—Using rotational grazing, using proper stocking rates, implementing a well planned clipping and harvesting schedule, and removing livestock in time to allow forage plants to recover before winter dormancy help to maintain pastures and increase productivity. Following lime and fertilizer recommendations based on soil tests helps to increase the availability of plant nutrients and maximizes productivity when establishing, maintaining, or renovating pasture and hayland.

Renovation can increase forage yields in areas that support a good stand of grass. This process includes partially destroying the sod, applying lime and fertilizer, and seeding desirable forage species. Plowing is not recommended for forage establishment or rejuvenation. In plowed areas, the soil can crust over after a rain, resulting in a high seedling mortality rate. In addition, the bare soil is susceptible to severe erosion. Sowing seed directly into the existing sod (“zip seeding”) is the preferred method. Adding legumes to the stand of grass provides high-quality feed and reduces the amount of nitrogen fertilizer needed. Legumes increase summer production and transfer nitrogen from the air into the soil.

Additional information about pasture and hayland can be obtained at the local office of the North Carolina Cooperative Extension Service, the Graham Soil and Water Conservation District, or the Natural Resources Conservation Service.

Orchards and Ornamental Crops

Jeffrey H. Owen, area extension forestry specialist, North Carolina State University, helped prepare this section.

General management needed for orchards and ornamental crops is suggested in this section. Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil in the section “Detailed Soil Map Units” and in the tables. Specific information can be obtained from the local office of the Natural Resources Conservation Service, the Cooperative Extension Service, or the Graham Soil and Water Conservation District.

Federal and State regulations require that any area designated as wetlands cannot be altered without prior approval. Contact the local office of the Natural Resources Conservation Service for identification of hydric soils and potential wetlands.

Orchards

In 2007, according to the U.S. Census of Agriculture and the North Carolina Cooperative Extension Service of Graham County, the county had less than 35 acres of commercial orchards.

A variety of soils in Graham County have been managed very successfully for ornamental crops and orchards, including some which have been flagged as potential problem soils. Orchards and berries in Graham County are grown for the “u-pick” and fresh markets and require intensive management and high maintenance. Ornamental crops are scattered in the county on intermediate and low mountains, on intermountain hills (in areas of Cheoah, Brasstown, and Stecoah soils), in coves and on terraces (in areas of Lonon, Thurmont, and Santeetlah soils), and on flood plains (in areas of Cullowhee, Dellwood, and Reddies soils). Mountains and coves in valleys in the central and eastern portions of the county are the major areas for growing ornamental crops.

A short discussion of several points relative to managing orchard crops follows. More detailed information and technical assistance may be obtained from the local office of the North Carolina Cooperative Extension Service, the Natural Resources Conservation Service, and the Graham Soil and Water Conservation District.

Growers should refer to the section “Detailed Soil Map Units” and **table 5** for information on map unit composition, soil properties and behavior, management concerns and considerations, and suitability ratings. The thickness and texture of soil layers is shown in the USDA texture column in **table 16**. **Table 17** shows the general range of clay in the surface layer and organic matter content. **Table 19** and **table 20** show depth to a water table, flooding frequency, and depth to bedrock for soils in the survey area. The data represents what is typical across the county. Conditions of individual map units may vary.

Map Unit Suitability

Table 5 shows the suitability of soils in the survey area for apple orchards, Fraser fir production, ball and burlap harvesting, line-out beds, and vegetable production. In the table, *well suited, suited, poorly suited,* and *unsuited* are used to indicate the degree of the soil limitations to be considered in the production of orchards and ornamentals. These suitability ratings can be used as guides in commercial operations with goals that include maintaining the integrity of the ecosystem, a sustainable harvest, and a cost-effective level of management. Slope is considered a limitation for safe equipment use. Ratings are based on land that is presently cleared. The cost of land clearing and the impact on the soil resource will lower the suitability. The size of a management area and the condition of the soil resource due to past management decisions were not considered. Soil limitations may be overcome with increased management, which in turn increases the cost of production. The cost of business varies from site to site and depends on short- and long-term management goals and the unique set of soil, plant, landscape, and climatic relationships on the site. An onsite investigation is recommended to determine site-specific conditions, especially on flood plains, in drainageways, in map units with slopes of more than 30 percent, and on sites at elevations above about 4,000 feet.

Technical assistance may be obtained from the local office of the North Carolina Cooperative Extension Service, the Graham Soil and Water Conservation District, and the Natural Resources Conservation Service.

Soil-Plant-Landscape-Climate Relationships

The selection of apple varieties to manage depends on an assortment of soil, plant, landscape, and climatic variables and their interactions. These variables include apple variety requirements, past land management, elevation, aspect, landscape position, soil type, and rainfall. Site preparation, maintenance, related management costs, and market demand should also be considered. An onsite investigation is recommended to determine site-specific conditions, especially on flood plains, in drainageways and coves, in map units with greater than 30 percent slopes, and on sites at elevations above 3,800 feet.

Naturally occurring site factors influence site productivity and are important considerations. Elevation and aspect affect the amount of sunlight a site receives and the rate of evaporation. Sites at the higher elevations have shorter growing seasons and/or harsh climates. Soils on cool, north- to east-facing aspects generally have a surface layer that is thicker and has more organic matter than that of soils on warm slopes. Due to the cooler air temperatures associated with north- to east-facing aspects, there is a potential that late spring frost will damage new growth in some years. Slow air drainage and/or frost pockets may also allow late spring frost to damage new growth in some years in drainageways and coves. Sites on south-facing slopes are warmer and drier than those on north-facing slopes. Examples of soils on warm side slopes are Brasstown and Stecoah. Cheoah and Snowbird soils are on cool side slopes, and Lonon and Santeetlah are in coves and on footslopes. Soils on flood plains are not suited to orchards because of soil wetness, flooding, and the high potential for frost damage.

The amount of rainfall, elevation, and length of growing season also influence site productivity. Summer rainfall in the survey area is variable. Growth on shallow and moderately deep soils, such as Sylco, Soco, Junaluska, Ditney, and Unicoi, is limited by a low available water-holding capacity. While the amount of rainfall generally increases as elevation increases, productivity gains may be offset by the shorter growing season and/or climatic conditions. For orchards, the most productive sites are generally at elevations below about 3,800 feet.

Topography should be uniform and sloping to allow for good air drainage and to minimize the occurrence of frost pockets. The steepness and length of slopes, landform shape, and position on the slope also affect water movement and availability. Sites that are gullied and have ravines or sites with abrupt slope changes should be avoided. Trees planted in wet soils (those either subject to flooding, affected by seeps and springs, or in natural drainageways) produce low yields and are more susceptible to disease. Orchards should be established near an adequate supply of water. Good sites are in areas of very deep, well drained soils. Examples are Brasstown, Stecoah, and Lonon soils.

Layout and Erosion Control

The layout of an orchard should include outlets for water flowing in from higher areas and for water flowing out of the orchard. Field borders and diversions, which empty into grassed waterways, dispose of flowing water without causing erosion. A healthy ground cover controls runoff, allows for more water infiltration into the soil, and reduces evaporation losses. Sod should be established between rows of trees and on all roads and erosion-control structures. It should be established as construction proceeds. Rows of trees should be laid out on the contour or across the slope and as nearly parallel to each other as possible. This arrangement helps control erosion and allows easy access. Planning for access roads is very important. Short or dead-end roads, which make equipment use difficult, and roads with sharp turns or grades above 10 percent should not be constructed. Wet sites and natural drainageways should be avoided. Water bars, side ditches, and culverts should be installed when these areas are unavoidable.

Soil Quality

A short discussion of several points relative to soil quality improvements follows. Enhanced soil quality can help to reduce the onsite and offsite cost of soil erosion, improve nutrient utilization, and ensure that the soil resource is sustained for future use. The soil’s physical, chemical, and biological properties must be at optimal levels for high yields to be maintained on a sustainable basis.

Soil fertility.—The soils in Graham County are not naturally fertile enough to sustain orchards. Typically, they are acidic and low in nitrogen and phosphorus. Both organic and chemical fertilizers increase nutrient levels in the soil. By decreasing soil acidity with lime, the availability of nutrients and the activity of beneficial bacteria are increased. Lime also neutralizes exchangeable aluminum, reducing aluminum toxicity to crops. Applications of lime and fertilizer should be determined by soil tests and by plant tissue analysis. It is important that lime is incorporated into the soil before trees are planted because of its slow movement into the root zone when applied to the surface. Lime and fertilizer should also be applied to sites of access roads and erosion-control structures to maintain the sod.

Soil biological improvements.—Optimum soil quality supports a sustainable harvest and a cost-effective level of management. The soil must have a diverse, strongly active biological community for optimum soil quality. A single handful of such soil contains more individual microbes, micro-arthropods, and other life forms than there are people on the earth. Organic matter is the key to the biological health of the soil. It serves as the food source for numerous types of beneficial bacteria, fungi, protozoa, nematodes, micro-arthropods, and larger animals. Biological improvements require more organic matter, healthy cover crops, and the careful selection and application of herbicides and other pesticides. These improvements also benefit the soil's physical and chemical components. The available supply of nutrients for plant growth is affected by several soil properties, including the organic matter content of the surface layer. Decomposition of organic matter to humus and the mineralization of humus release nitrogen and other nutrients, such as calcium, magnesium, and potassium, to plants. Organic matter can be added to the soil in some cases or be allowed to build up in place under cover crops. Removing the cover crop with herbicides or tillage allows for the rapid break down of organic matter.

Pest control.—Herbicides and other pesticides may be necessary for controlling weeds, harmful insects, and disease and, where possible, should be applied by banding or spot treatment. Label directions must be followed to control target organisms and minimize contamination of soil, water, air, and nontarget organisms. Soil properties, such as organic matter content and clay content of the surface layer, affect the rate of soil-applied applications. Estimates for these properties were determined for the soils in this survey area. The thickness and texture of the soil layers is shown in the USDA texture column in **table 16**. **Table 17** shows the general range of clay content and organic matter content of the surface layer.

In some areas, the organic matter content of a soil may be outside the range shown in **table 17**. The content may be higher in soils that have received high amounts of animal or manmade waste. Soils that have recently been brought into cultivation (pasture conversion) may have a higher content of organic matter in the surface layer than similar soils that have been cultivated (cropland conversion). Lower levels of organic matter are common in soils where the surface layer has been partly or completely removed by erosion, land smoothing, or other activities such as woodland clearing.

Soils such as Cheoah and Santeetlah have enough organic matter in the surface layer to inhibit the activity of soil-applied pesticides. Current soil tests should be used to measure the organic matter content before soil-applied rates are determined. The label of the pesticide container provides further instructions. Eroded soils, such as Braddock, may have enough clay in the surface layer to bind herbicides and other pesticides.

On wet soils, such as Cullowhee and Ela, and in areas with seeps and springs, the effectiveness of soil-applied pesticides may be reduced and the contamination of surface and ground waters made possible. Saturated soils and areas with excess surface water from prolonged rains or irrigation can carry herbicides and other pesticides to surface waters. The contamination of surface and ground waters is also a concern in areas of Dellwood and Reddies soils due to a high leaching rate caused by a low clay content. **Table 19** shows depth to a water table and flooding frequency for soils in the survey area.

Erosion-control practices, such as maintaining permanent ground cover and establishing grassed filter strips in drainageways and field borders, help to minimize soil loss and runoff that can carry absorbed or dissolved herbicides and other pesticides to surface waters. Utilizing weather forecasts and scheduling irrigation so it does not conflict with herbicide and pesticide use help to reduce contamination problems.

The pesticide product labels show specific application rates based on the organic matter content and clay content of the soil. Please refer to the section “Detailed Soil Map Units” and **table 5** for information on map unit composition, soil properties and behavior, and management concerns and considerations.

Integrated pest management programs avoid unnecessary pesticide applications. Orchards are scouted to determine if pests are present and then monitored to determine when populations merit control in order to prevent economic loss. This allows for the timeliest use of the pesticide and thus the most cost-effective alternative.

Other methods of weed, pest, and disease control include the use of goats, biological agents, mulching, mowing, and hand weeding. These viable alternatives can be used alone or in combination with chemical control. The latest information on these types of control can be obtained at the local office of the North Carolina Cooperative Extension Service, the Graham Soil and Water Conservation District, or the Natural Resources Conservation Service.

Ornamental Crops

In 2007, according to the U.S. Census of Agriculture and the North Carolina Cooperative Extension Service of Graham County, the county had approximately 45 acres of ornamental crops.

A short discussion of several points relative to managing ornamental crops follows. More detailed information and technical assistance may be obtained from the local office of the North Carolina Cooperative Extension Service, Natural Resources Conservation Service, or Graham Soil and Water Conservation District.

A variety of soils in Graham County have been managed very successfully for ornamental crops, including some which have been flagged as potential problems soils. Growers should review the section “Detailed Soil Map Units” and **table 5** for information on map unit composition, soil properties and behavior, management concerns and considerations, and suitability ratings. The thickness and texture of soil layers is shown in the USDA texture column in **table 16**. **Table 17** shows the general range of clay in the surface layer and organic matter content for soils in the survey area. **Table 19** shows depth to a water table, flooding frequency, and depth to bedrock. This data represents what is typical across the county. Conditions of individual map unit delineations may vary.

Map Unit Suitability

Suitability ratings are guides for consideration by commercial operations with goals that include maintaining the integrity of the ecosystem, a sustainable harvest, and a cost-effective level of management. Ratings are based on land that is presently cleared. The cost of land clearing and the impact on the soil resource will lower the suitability. Size of a management area and the condition of the soil resource due to past management decisions were not considered. Two examples of soil conditions that negatively affect current productivity and suitability are severe erosion and soil compaction. Slope is considered a limitation for safe equipment use.

Table 5 rates the ability of the soils to produce some ornamental crops grown in Graham County. *Well suited, suited, poorly suited,* and *unsuited* are used to indicate the degree of the major soil limitations to be considered in ornamental crop production.

Figure 27.—Ornamentals in an area of Dillard loam, 1 to 5 percent slopes, rarely flooded. Landscaping plants are an important part of the ornamental crop industry in Graham County.

Well suited indicates that no limitations affect production although there may be inclusions of limiting, dissimilar soils or site features. *Suited* indicates that one or two limitation affect production. *Poorly suited* indicates that two or more limitations affect production. Some of these limitations may be overcome by higher levels of management which, in turn, increase the cost of production. *Unsuited* indicates that there are limitations that cannot be overcome.

An onsite investigation is recommended to determine site-specific conditions, especially on flood plains, in drainageways, in map units with slopes of more than 30 percent, and on sites at elevations above about 4,000 feet.

Technical assistance may be obtained from the local office of the North Carolina Cooperative Extension Service, the Graham Soil and Water Conservation District, or the Natural Resources Conservation Service.

Soil-Plant-Landscape-Climate Relationships

Ornamental crops are grown in eastern Graham County and include Christmas trees; landscaping plant materials, such as mountain laurel, rhododendron, hemlock, boxwood, and other species of native trees, shrubs, and herbaceous plants; vineyards; and medicinal plants and herbs (fig. 27). Selecting species for planting is dependent on a variety of soil, plant, landscape, and climatic variables and their interactions. These variables include individual species requirements, past land management, elevation, aspect, landscape position, soil type, and rainfall. Site preparation, maintenance and related management costs, and market demand should also be considered. An onsite investigation is recommended to determine site-specific conditions, especially on flood plains, in drainageways and coves, for map units with greater than 30 percent slopes, and on sites with elevations above 4,000 feet.

Elevation and aspect.—Naturally occurring site factors are important considerations due to their influence on site productivity and a wide variety of management decisions.

In general, the most productive sites are generally below 4,000 feet in elevation. Sties at the higher elevations have shorter growing seasons and/or harsh climates as compared to sites at the lower elevations. Aspect affects the amount of sunlight a site receives and the rate of evaporation. Soils on cool, north- to east-facing aspects generally have a surface layer that is thicker and has more organic matter than that of soils on warm slopes. On north- to east-facing aspects, due to the cooler air temperatures, late spring frost may damage new growth in some years. On flood plains, in drainageways, and in coves, due to low air drainage and/or frost pockets, late spring frost may damage new plant growth. Sites on south-facing slopes are warmer and drier than those on north-facing slopes. Brasstown and Stecoah soils occur on warm side slopes. Cheoah and Snowbird soils occur on cool side slopes. Lonon and Thurmont soils are in coves and on footslopes. Reddies and Dellwood soils occur on flood plains.

Rainfall and droughtiness.—The amount of rainfall, elevation, and length of the growing season influence site productivity. Summer rainfall in the survey area is abundant but uneven. While the amount of rainfall generally increases as elevation increases, productivity gains at the higher elevations may be offset by the shorter growing season and/or climatic conditions. Growth on soils that are shallow or moderately deep to bedrock, such as Cataska, Sylco, Junaluska, Ditney, Jeffrey, Soco, Tsali, and Unicoi soils, is limited by a low water-holding capacity.

Landform and soil water.—The position on a landform, steepness and length of slope, and landform shape (such as convex or concave) affect water movement and availability. A healthy ground cover controls runoff, allows for greater water infiltration into the soil, and reduces evaporation losses. In areas where water ponds or concentrates, such as toeslopes, footslopes, drainageways, and concave and depressional areas, Fraser fir and other ornamentals are susceptible to phytophthora root disease. These areas should be avoided. Phytophthora root disease is a concern for upland, cove, and flood plain sites regardless of landform or soil type. On any site that has been exposed to the fungus and has then become saturated with water during an extended rainy period, root disease can become established and spread.

Other soil-site properties.—Native and hybrid ornamental crops grow well on well drained, loamy soils. There should not be so many surface stones or boulders or coarse fragments in the soil that cultivation or ball and burlap harvesting are hindered. Depth to bedrock should not limit rooting depth. Sites should be protected, especially at the higher elevations, from northwest winter winds which can desiccate plants. Flooding, even on an occasional basis, is a concern because ornamental crops are in the field for extended periods of time.

Clay content.—The clay content should be between 15 and 30 percent for optimum propagation and ball and burlap harvesting. Soils with a low clay content may need supplemental irrigation due to a low water-holding capacity and droughtiness. Soils that have a clay content of less than 15 percent in the top 20 inches should not be used for ornamental species that are to be ball and burlap harvested. These soils do not cling together and thus ball poorly. Soils that have a clay content of more than about 30 percent should not be used for ornamental species. These soils hold excess moisture around roots, which can result in poor growth and encourage phytophthora root disease. Access with machinery is limited when the soil is wet. Also, soils that have a high clay content can only be dug within in a narrow range of soil moisture. Digging at the appropriate time prevents damage to the root ball but may not coincide with harvest schedules.

Upland soils, such as Brasstown, Stecoah, and Cheoah, and colluvial soils, such as Thurmont and Lonon, are suited to adapted ornamental crops. Flood plain soils, such as Dellwood and Reddies, are also used to grow certain adapted ornamentals. Flood plain soils present special management concerns due to a low water-holding capacity, moderately rapid or rapid internal drainage, surface fragments, cold air drainage, frost, and flooding frequency.

Erosion control, site preparation, and access.—Disturbing as little of the planting area as possible helps to prevent excessive erosion, maintains water quality, and protects the beneficial soil surface layer. Once a site is prepared and planted, areas between plant rows should remain in permanent vegetative cover. Planting in a grid arrangement allows easy access for hand labor and equipment used for mowing or harvesting. Sites should be selected in areas that have an adequate supply of clear water for irrigation.

Roads.—Access roads should be carefully planned and constructed on the contour. They should not be constructed in natural drainageways, in wet areas, or where the roadbed grade would exceed 10 percent. Limitations based on depth to bedrock, the presence of rocky areas, and the quantity of surface stones and boulders should be considered. Vegetating cleared and graded areas and cut and fill slopes as construction proceeds and using erosion-control structures, such as silt fences or catch basins, help to maintain soil stability and prevent sediments from leaving the site. Roads should be graveled or seeded with perennial vegetation to permit year-round use. Lime and fertilizer should be applied regularly to maintain the sod. Refer to “Access Roads” under the heading “Building Site Development” for more detailed information.

Marginal sites.—Areas that are forested and would require major timber and stump removal are less suited to ornamental and Christmas tree production. Clearing woodland and converting it to ornamental crop production creates a severe erosion hazard and is not recommended. The possibility for a positive cost-benefit ratio, especially where slopes of more than 30 percent need to be cleared, is uncertain.

Map units that have slopes of more than 30 percent are marginal due to limitations affecting safe equipment use. Access roads could be built and maintained but the cost of production would increase. Labor costs and the amount of time needed for harvest increase on these steep and very steep slopes. Also, plant shape (especially the lower branches) can be detrimentally affected on the uphill side of tree trunks or plant stems. Loss of the bottom whorl of a Christmas tree due to slope can add 1 to 2 years to a rotation.

Line-out beds.—Line-out beds should be located near an adequate supply of clear water for irrigation. They require soils that have about 10 to 15 percent clay in the upper 8 to 12 inches. Soils that have more clay hold seedling roots so tightly that tearing and breaking can result during harvesting. Such soils also hold water longer, providing a window for phytophthora root rot to grow. Flood plain soils that have dark, sandy surface layers, such as Reddies, are suited to line-out beds but require irrigation. Cove and upland soils with dark surface layers, such as Santeetlah and Cheoah, may also be suited to line-out beds. In these soils the relatively high clay content in the surface layer and organic matter content may be prohibitive due to a high water-holding capacity and the related susceptibility to phytophthora root disease.

Soil Quality

The following paragraphs discuss several points related to soil quality improvements. Enhancing soil quality can help to reduce the onsite and offsite costs of soil erosion, improve nutrient utilization, and ensure that the soil resource is sustained for future use. The soil’s physical, chemical, and biological properties must be at optimal levels for production levels to be maintained on a sustainable basis.

Soil fertility.—While the soils in Graham County are naturally acidic and generally low in natural fertility, ornamental crops benefit from soil amendments of lime, fertilizer, and organic matter. Following lime and fertilizer recommendations from soil tests and plant tissue analysis helps to increase the availability of nutrients and is a critical aspect of all management plans, large or small. Since calcium and phosphorus tend to remain in the surface layer of the soil when topdressed, incorporation of lime and fertilizer into the soil prior to planting is beneficial. Physical, chemical, and biological soil properties must be at optimal levels for production levels to be maintained on a sustainable basis.

Both organic and chemical fertilizers increase nutrient levels in the soil. Application rates are plant specific and should be based on soil tests and plant tissue analysis. Lime and fertilizer should also be applied to access roads and erosion-control structures to maintain the ground cover. Hand application may be required on steep slopes but the benefits of liming and fertilization should not be underestimated. The wet conditions of Cullowhee soils (and upland areas with seeps and springs) may reduce the effectiveness of the fertilizers and lime and/or allow for the contamination of surface and ground waters. Water contamination is also a concern for Dellwood and Reddies soils due to a high leaching rate and the depth to a water table. **Table 19** shows depth to a water table and flooding frequency for soils in the survey area.

Liming requirements are a major concern because high acidity levels in the soil reduce the availability of nutrients to plants and affect the activity of beneficial bacteria and the other components of the soil's biological community. Lime neutralizes exchangeable aluminum. This counteracts the adverse effects that high levels of aluminum impose on many crops. Liming with calcitic lime adds calcium to the soil, and liming with dolomitic adds both calcium and magnesium.

Soil tests also indicate the need for nitrogen, phosphorus, and potassium fertilizer. Phosphorus and potassium levels vary from field to field due to soil type and past management. Unlike nitrogen, their levels tend to build up in the soil over time if fertilizer has been applied on a regular basis.

Nitrogen fertilizer is required for most crops. Appropriate rates depend on the crop and the potential productivity of the soil. Application of nitrogen beyond what the plant can use during the growing season is not a recommended practice. The excess fertilizer not utilized by the crop creates an unnecessary expense and can result in water pollution through leaching or runoff. Nitrogen can be readily leached from the more sandy soils, such as Rosman, Dellwood, and Reddies, so that it becomes deficient in wet seasons. Split applications of nitrogen may be more effective on these soils during the growing season. Nitrogen rates may be reduced provided that organic matter levels are high. Where the ground cover has been removed by tillage or with herbicides, organic matter tends to break down more rapidly. Erosion-control practices, such as maintaining permanent ground cover and establishing grassed filter strips in drainageways and field borders, help to increase organic matter content and minimize soil loss and runoff that can carry adsorbed or dissolved fertilizer to surface waters.

Soil biological improvements.—Optimum soil quality supports a sustainable harvest and a cost-effective level of management and cannot be achieved unless the soil supports a diverse, strongly active biological community. A single handful of healthy soil contains more individual microbes, micro-arthropods, and other life forms than the number of people on all the earth. Organic matter is the key to the biological health of the soil. It serves as the food source for numerous types of beneficial bacteria, fungi, protozoa, nematodes, micro-arthropods, and larger animals. Biological improvements require more organic matter, healthy cover crops, and the careful selection and application of herbicides and other pesticides. These improvements also benefit the soil's physical and chemical components. The available supply of nutrients for plant growth is affected by several soil properties, including the organic matter content of the surface layer. The decomposition of organic matter into humus and the mineralization of humus release nitrogen and other nutrients, such as calcium, magnesium, and potassium, to plants. Organic matter (composted or decayed) can be added to the soil in some cases or allowed to build up in place under cover crops. Removing the cover crop with herbicides or tillage allows the rapid break down of organic matter.

Pest control.—Herbicides and other pesticides may be necessary for controlling weeds, harmful insects, and disease and should be applied by banding or spot treatment. Label directions must be followed to control target organisms and minimize the contamination of soil, water, air, and nontarget organisms. Soil properties, such as the organic matter content and the clay content of the surface layer, affect the rate of soil-applied pesticides. Estimates for these properties were determined for the soils in Graham County. The thickness and texture of the soil layers is shown in the USDA texture column in **table 16**. **Table 17** shows the general range of the clay content and the organic matter content in the surface layer.

In some areas, the organic matter content of a soil may be outside the range shown in **table 17**. The content may be higher in soils that have received high amounts of animal or manmade waste. Soils that have recently been brought into cultivation (pasture conversion) may have a higher organic matter content in the surface layer than similar soils that have been cultivated (cropland conversion). Lower levels of organic matter are common in soils where the surface layer has been partly or completely removed by erosion, land smoothing, or other activities such as woodland clearing.

Pesticide effectiveness.—Soils such as Cheoah, Dellwood, Reddies, Whiteoak, and Santeetlah have enough organic matter in the surface layer to inhibit the activity of soil-applied pre-emergent herbicides and other pesticides. Current soil tests should be used to measure the organic matter content before soil-applied rates are determined. Eroded soils such as Braddock may have enough clay in the surface to bind pre-emergent herbicides and other soil-applied pesticides. Where these types of soils are managed, growers should refer to the label of the pesticide container for specific instructions and application rates.

The wet conditions of Cullowhee and Ela soils and areas with seeps and springs may reduce the effectiveness of some pesticides and result in the contamination of surface and ground waters. Saturated soils and areas with excess surface water from prolonged rains or irrigation can carry herbicides and other pesticides to surface waters. The contamination of surface and ground waters is also a concern on Dellwood and Reddies soils due to a high leaching rate caused by a low clay content. **Table 19** shows depth to a water table and flooding frequency for soils in the survey area.

Erosion-control practices, such as maintaining permanent ground cover and establishing grassed filter strips in drainageways and field borders, help to minimize soil loss and runoff that can carry absorbed or dissolved pesticides to surface waters. Utilizing weather forecasts and scheduling irrigation so that it does not conflict with pesticide use can reduce contamination problems.

Integrated pest management.—Integrated pest management programs avoid unnecessary pesticide applications. Crops are scouted to determine if pests are present and then monitored to determine when populations merit control in order to prevent economic loss. This allows the timeliest use of the pesticide and thus the most cost-effective approach to the chemical control of pests. Other methods of weed, animal, and disease control include the use of goats, biological agents, mulching, mowing, and hand weeding. These viable alternatives can be used alone or in combination with chemical control. The latest information on these types of control can be obtained at the local office of the North Carolina Cooperative Extension Service, the Natural Resources Conservation Service, or the Graham Soil and Water Conservation District

Phytophthora root rot.—Phytophthora root rot is a soil-borne disease caused by the fungus *Phytophthora cinnamomi*. It is a problem where the movement of air and water in the soil is restricted. This restricted movement may be the result of a high content of organic matter in the surface layer, the clay content, soil compaction, a seasonal high water table, or soil wetness caused by flooding, ponding, overland flow of storm water, or an extended wet spell in which soils remain saturated.

In areas that receive high amounts of water, a surface layer with a high organic matter content may hold water long enough and frequent enough that phytophthora can take hold. This is also a concern where the soil is compacted or the clay content in the surface layer differs enough from that in the subsoil that percolation is slowed or stopped and water perches.

In landscape positions where water concentrates, such on toeslopes, on footslopes, in drainageways, below wet weather seeps and springs, and in concave and depressional spots, plants are susceptible to phytophthora root rot. All map units potentially contain these areas. These areas should be avoided.

Phytophthora root rot can also be transported from field to field on equipment or by flooding and storm water runoff. Potential contamination of irrigation ponds and streams by storm runoff from contaminated fields should also be considered.

It is also possible to transport phytophthora to the field on plants from infected line-out beds. The aforementioned soil-site conditions and considerations apply to locating and establishing line-out beds. Proper drainage and protection from flooding, overland flow, and ponding of storm water are critical in establishing and maintaining healthy line-out beds.

Yields Per Acre

The average yields per acre that can be expected of principal crops under a high level of management are shown in **table 6, parts I and II**. In any given year, yields may be higher or lower than those indicated in the table due to variations in rainfall and other climatic factors. Soil quality and the effects of past management decisions affect present-day yields. The land capability classification of each map unit is also shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and agricultural extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The high level of management needed to realize the estimated yields depends on the kind of soil and the crop. Management can include erosion control; protection from flooding; proper planting and seeding rates; selection of high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

A high level of management also includes maintaining proper soil reaction and fertility levels as indicated by soil tests. Favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements are critical. The application of nitrogen in excess of that required for potential yields generally is not recommended. The excess nitrogen fertilizer that is not utilized by the crop is an unnecessary expense and can result in the pollution of surface and ground waters. Because nitrogen can be readily leached from sandy soils, applications may be needed on these soils more than once during the growing season.

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

Crops other than those shown in **table 6** are grown in the survey area, but estimated yields are not listed because the current acreage of such crops is small. The local office of the Natural Resources Conservation Service or the North Carolina Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops (USDA-SCS, 1961). Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland and for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by numerals 1 through 8. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have few limitations that restrict their use.

Class 2 soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class 5 soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation.

Class 7 soils have very severe limitations that make them unsuitable for cultivation.

Class 8 soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, 2e. The letter *e* shows that the main hazard is the 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; *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w, s,* or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, woodland, wildlife habitat, or recreation.

The capability classification of each map unit is given in the section “Detailed Soil Map Units” and in **table 6**.

Prime Farmland and Other Important Farmlands

Table 7 lists the map units in the survey area that are considered prime farmland, unique farmland, and farmland of statewide or local importance. This list does not constitute a recommendation for a particular land use.

In an effort to identify the extent and location of important farmlands, the Natural Resources Conservation Service, in cooperation with other interested Federal, State, and local government organizations, has inventoried land that can be used for the production of the Nation’s food supply.

About 4,388 acres in Graham County, or about 2 percent of the area, meets the soil requirements for prime farmland. About 2003 acres, or about 1 percent of the survey area, meets the soil requirements for farmland of statewide importance. Approximately 20,066 acres, or about 11 percent of the survey area, is farmland of local importance. This acreage pertains to land previously cleared and in (at least) pasture or hayland production and includes orchards and vineyards, seed beds and line-out beds for ornamental crop production, and Christmas tree production. Most of these areas require a more hands-on approach to production, less mechanization, and less ground-disturbing activities than areas used for typical row crop production. The cost(s) of production are considered acceptable by the producer and the agricultural community.

Prime farmland is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil quality, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. The water supply is dependable and of adequate quality. Prime farmland is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

A recent trend in land use in some areas has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

For some soils identified in the table as prime farmland, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures.

Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, and other fruits and vegetables. It has the special combination of soil quality, growing season, moisture supply, temperature, humidity, air drainage, elevation, and aspect needed for the soil to economically produce sustainable high yields of these crops when properly managed. The water supply is dependable and of adequate quality. Nearness to markets is an additional consideration. Unique farmland is not based on national criteria. It commonly is in areas where there is a special microclimate, such as the wine country in California.

In some areas, land that does not meet the criteria for prime or unique farmland is considered to be *farmland of statewide importance* for the production of food, feed, fiber, forage, and oilseed crops. The criteria for defining and delineating farmland of statewide importance are determined by the appropriate State agencies. Generally, this land includes areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some areas may produce as high a yield as prime farmland if conditions are favorable. Farmland of statewide importance may include tracts of land that have been designated for agriculture by State law.

In some areas that are not identified as having national or statewide importance, land is considered to be *farmland of local importance* for the production of food, feed, fiber, forage, and oilseed crops. This farmland is identified by the appropriate local agencies. Farmland of local importance may include tracts of land that have been designated for agriculture by local ordinance.

Hydric Soils

Table 8 lists the map unit components that are rated as hydric soils in the survey area. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 2002).

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for all of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in “Soil Taxonomy” (USDA-NRCS, 1999) and “Keys to Soil Taxonomy” (USDA-NRCS, 2010) and in the “Soil Survey Manual” (USDA-NRCS, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in “Field Indicators of Hydric Soils in the United States” (Hurt and others, 2002).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

Map units that are dominantly made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units dominantly made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

The criteria for hydric soils are represented by codes in the table (for example, 2B3). Definitions for the codes are as follows:

1. All Histels except for Folistels, and Histosols except for Folists.
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:
   A. are somewhat poorly drained and have a water table at the surface (0.0 feet) during the growing season, or
   B. are poorly drained or very poorly drained and have either:
      1) a water table at the surface (0.0 feet) during the growing season if textures are coarse sand, sand, or fine sand in all layers within a depth of 20 inches, or
      2) a water table at a depth of 0.5 foot or less during the growing season if permeability is equal to or greater than 6.0 in/hr in all layers within a depth of 20 inches, or
      3) a water table at a depth of 1.0 foot or less during the growing season if permeability is less than 6.0 in/hr in any layer within a depth of 20 inches.
3. Soils that are frequently ponded for long or very long duration during the growing season.
4. Soils that are frequently flooded for long or very long duration during the growing season.

Forestland Management and Productivity

Albert Coffey, forester (retired), Natural Resources Conservation Service; Harold Phillips, county ranger, North Carolina Department of Environment and Natural Resources, Division of Forest Resources; and Dan Manning, soil scientist (retired), and John Blanton, silviculturalist, U.S. Forest Service, helped prepare this section.

Owners of forestland in Graham County have many objectives. These objectives include producing timber; conserving wildlife, soil, and water; preserving esthetic values; and providing opportunities for recreational activities such as camping and hunting. Public demand for clean water and recreational areas creates pressures and opportunities for owners of forestland.

The landowner interested in timber production is faced with the challenge of producing greater yields from smaller areas. These smaller areas are primarily due to trends in land ownership, including increased residential and commercial development. Meeting this challenge requires intensive management and silvicultural practices. Extensive practices directed toward ecosystem management should incorporate appropriate harvest regimes, such as the management of uneven-age timber stands and shelter wood (fig. 28). Modern silvicultural techniques include establishing, releasing, and thinning a desirable young stand; propagating the more productive species or genetic varieties; providing appropriate rotations and fiber utilization; and controlling insects, diseases, and undesirable species. Although timber crops require decades to grow, the goal of intensive management is similar to that of intensive agriculture. This is to produce a sustainable yield of the most valued crop while maintaining the integrity of the ecosystem.

Forestland covers about 177,852 acres, or about 93 percent of the land area of Graham County. Of this, timberland or commercial forest covers about 164,174 acres, or about 85 percent of the county. Timberland is land that is producing or is capable of producing crops of industrial wood and that has not been withdrawn from timber production.

Northern red oak, yellow-poplar, and eastern white pine are the most important commercial timber species in the county because they are adapted to the soil and climate and bring the highest average sale value per acre.

Acreage figures were adjusted based on the Continuous Inventory of Stand Condition (CISC) database maintained by the Forest Service. Land classes in CISC for mountain lands managed by the National Forests in North Carolina are in accordance with Management Area criteria and emphases as detailed in the “Land and Resource

Figure 28.—A stand of yellow-poplar in an area of Snowbird loam, 30 to 50 percent slopes, stony. This species responds well to timber stand improvement, resulting in improved productivity.

Management Plan," Amendment 5, Nantahala and Pisgah National Forests, March 1994.

For purposes of forest inventory, the predominant general forest types identified in Graham County are as described in the following paragraphs.

White pine-hemlock. This general forest type covers 9,914 acres. It is predominantly eastern white pine. Commonly included trees are hemlock, red maple, and sweet birch.

Shortleaf pine. This general forest type covers 5,753 acres. It is predominantly shortleaf pine and Virginia pine in combination and constitutes the majority of the stocking. Commonly included trees are pitch pine, scarlet oak, chestnut oak, white oak, and red maple.

Oak-pine. This general forest type covers 5,752 acres. It is predominantly hardwoods, typically upland oaks. Pine species make up 25 to 50 percent of the stand. Commonly included trees are hickory, red maple, and yellow-poplar.

Maple-beech-birch. This general forest type covers 11,505 acres. It is predominantly sugar maple, American beech, yellow birch, or a combination of these species. Commonly included trees are northern red oak, white ash, hemlock, and black cherry.

Oak-hickory. This general forest type covers 131,250 acres. It is predominantly upland oaks or hickory, or both. Commonly included trees are yellow-poplar, red maple, and black locust.

For purposes of management, the general forest types are grouped into Society of America Foresters (SAF) forest types as follows: yellow pine, eastern white pine, upland hardwoods, cove hardwoods, northern hardwoods, and spruce-fir. The characteristics of a given site (soils, rainfall, aspect, etc.) indicate which forest type will grow best on that site and are discussed later in this section.

Yellow Pine (SAF-75 & 79: Shortleaf Pine and Virginia Pine). This SAF forest type generally occurs on abandoned cropland, in areas that have been cleared or burned and reseeded, and on soils with low productivity on dry, hot ridges and side slopes in the low mountains. Shortleaf pine, pitch pine, and Virginia pine are the dominant species. This type occurs primarily in the central part of the county and generally at elevations below 3,000 feet. Various dry-site hardwoods, such as scarlet oak, chestnut oak, blackgum, and sourwood, are associated with this forest type. Soils that are underlain by low-grade metamorphic metasedimentary rock commonly support this forest type. They include Sylco, Cataska, Junaluska, and Brasstown soils.

Eastern White Pine (SAF-21: Eastern White Pine). This SAF forest type occurs on a wide range of well drained cove and upland sites that previously supported the oak-hickory general forest type or in abandoned pastures. Before fire control, white pine may have occupied moist slopes where fires were infrequent or of low intensity. This SAF forest type produces a higher volume of wood and has a shorter rotation than other upland forest types. In Graham County, eastern white pine regenerates naturally where there is a seed source; however, in many areas it is planted. This type occurs mostly at elevations below 3,500 feet but can be at elevations at high as 4,000 feet. Various dry-site hardwoods, such as scarlet oak, chestnut oak, blackgum, and sourwood, are associated with this forest type. Soils that are underlain by low-grade metamorphic metasedimentary rock commonly support this forest type. They include Stecoah, Soco, Sylco, Cataska, Junaluska, and Brasstown soils.

Upland Hardwoods (SAF-52: White Oak-Black Oak-Northern Red Oak). This SAF forest type occurs on upland side slopes and ridges on various aspects at elevations as high as about 4,000 feet. This is the most extensive forest type in the county. It also produces the lowest volume of wood per acre and shows the most effects of past high grading. If properly managed, this forest type can produce high-quality timber. Dominant species vary from northern red oak, white oak, and yellow-poplar on cool, moist, north- to east-facing slopes and those slopes shaded by the higher mountains to scarlet, chestnut, black oak, and hickory on hot, dry, west- to south-facing slopes. Major soils on warm aspects that support this forest type are Brasstown, Junaluska, Soco, and Stecoah. Major soils on cool aspects are Cheoah, Jeffrey, and Snowbird.

Cove Hardwoods (SAF-57: Yellow-Poplar). This SAF forest type is in coves and drainageways at elevations below about 4,800 feet. It has the potential to produce high volumes of wood per acre when compared with other forest types. The most common species is yellow-poplar. Stands also include northern red oak, white oak, black cherry, sweet birch, eastern hemlock, white pine, American basswood, yellow buckeye, and white ash. At elevations above about 4,000 feet, yellow-poplar is less dominant and northern red oak, black cherry, white ash, sweet birch, yellow buckeye, yellow birch, and sugar maple are more common. Soils that commonly support this forest type at elevations below 4,000 feet include Lonon, Santeetlah, Spivey, Thurmont, Northcove, and Whiteoak.

Northern Hardwoods (SAF-25: Sugar Maple-Beech-Yellow Birch). This SAF forest type is on cool landscapes at elevations of about 3,500 to 5,000 feet. Below an elevation of 4,200 feet, it is on north- to east-facing slopes or those slopes shaded by the higher mountains. Above an elevation of 4,200 feet, it is on side slopes and ridges on various aspects. On prominent ridgetops, on upper side slopes, and at elevations above 4,800 feet, trees exhibit slow growth and poor form due to frequent ice storms and high winds. Common species are northern red oak, mountain magnolia (cucumber tree, bigleaf, umbrella, and Fraser), white ash, beech, sweet birch, yellow birch, black cherry, and sugar maple. A large percentage of the trees in this forest type are commercially valuable species. Soils that are underlain by metasedimentary rock commonly support this forest type. They include Spivey, Whiteoak, and Santeetlah soils in coves and Cheoah, Jeffrey, and Snowbird soils on side slopes. Above an elevation of about 5,000 feet, they include Breakneck, Pullback, Luftee, and Anakeesta soils on side slopes and ridges.

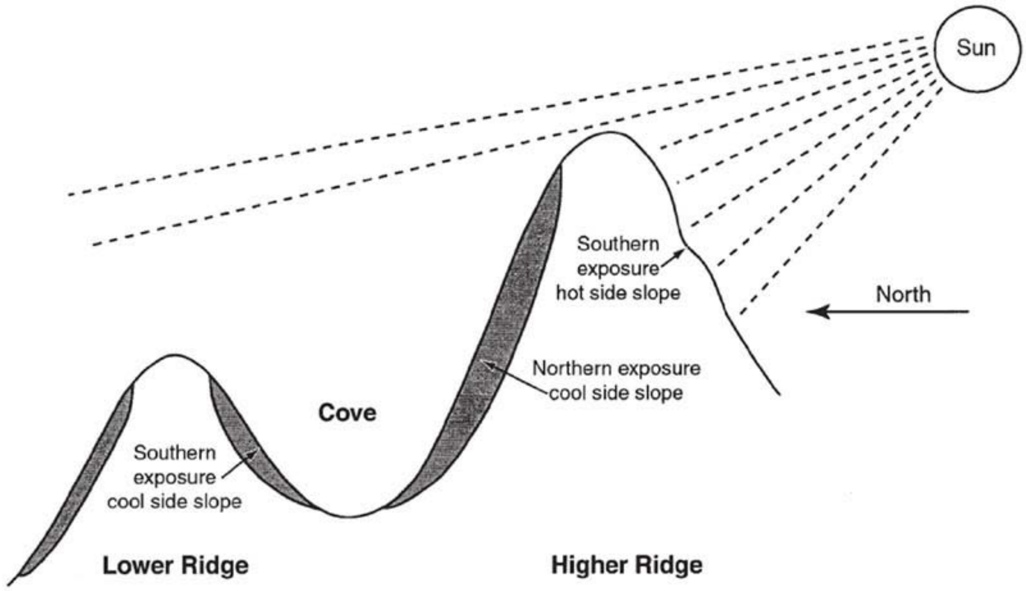


Figure 29.—Cool slopes include north- to east-facing slopes, those shaded by the higher mountains, and commonly those in coves. Woodland in these areas can be more productive but is susceptible to late spring and early fall frosts.

One of the first steps in planning intensive forestland management is to determine the potential productivity of the soil for several alternative tree species. The most productive and/or valued trees are then selected for each soil type. Site and yield information enables a forest manager to estimate future wood supplies. These estimates are the basis of realistic decisions concerning short- and long-term timber management goals, expenses and profits associated with intensive forestland management, land acquisition, and industrial investments.

The productive capacity of forestland depends on physiography, soil properties, climate, and the effects of past management. Specific soil properties and site characteristics, including soil depth, texture, structure, and depth to a water table, affect forest productivity primarily by influencing the available water-holding capacity, aeration, and root development. The net effects of the interaction of these soil properties and site characteristics determine the potential site productivity.

Examples of past management decisions that limit productivity are overgrazing, severe erosion, and timber high grading. These factors can affect forest health, vitality, species composition, and ultimately the quantity, quality, and value of the timber produced. The potential volume of wood produced by a stand of timber is not always the best indicator of the value of a site. Species composition and quality are as important as volume.

Naturally occurring site factors are also important to consider. The steepness and length of slopes and landform position affect water movement and availability. Elevation and aspect affect the amount of sunlight a site receives and the rate of evaporation. Sites on south-facing slopes are warmer and drier than those on north-facing slopes. The amount of rainfall and length of the growing season influence site productivity. While the amount of rainfall generally increases as elevation increases, productivity gains at higher elevations may be offset by the shorter growing season. All of these factors affect woodland productivity and the site index. The most productive sites are generally at elevations below 4,000 feet, on north- to east-facing slopes or those shaded by the higher mountains (fig. 29), in sheltered coves, or in concave areas such as benches, footslopes, and toeslopes. Most soils on these cool slopes have thicker A horizons and have more organic matter than soils on warm slopes.

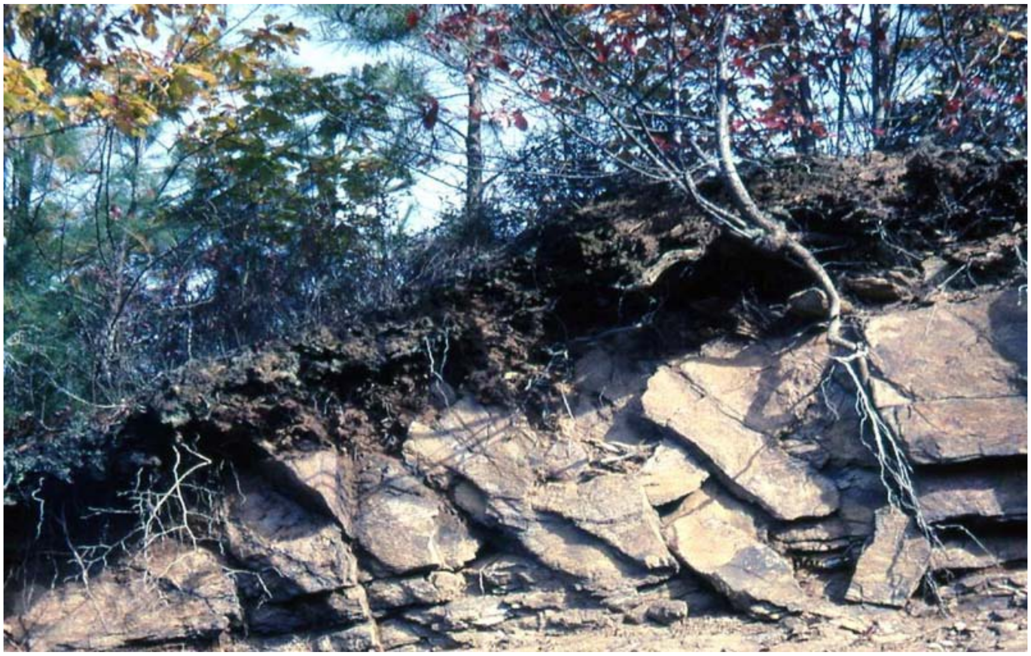


Figure 30.—Woodland productivity on shallow and moderately deep soils is limited due to droughty conditions caused by a limited reservoir of soil moisture and a restricted root zone.

Cheoah, Jeffrey, and Snowbird soils are on cool side slopes. Spivey, Santeetlah, Lonon, Northcove, and Whiteoak soils are on footslopes.

Map units of soils on warm slopes include such minor components as areas in narrow, unmapped drainageways. These areas can produce yields higher than those indicative of the soil map unit as a whole. Map units of soils on cool slopes include such minor components as areas on exposed spur ridges. These areas can produce yields lower than those indicative of the soil map unit as a whole. In either case, different tree species may occur in these areas of minor components.

A knowledge of soils helps to provide a basic understanding of the distribution and growth of tree species on the landscape. For example, yellow-poplar grows well on deep or very deep, moist soils and scarlet oak or pine is common in areas where the rooting depth is restricted or the moisture supply is limited. The availability of water and nutrients, parent material, and landform position largely determine which tree species grow on a particular soil.

Soil serves as a reservoir for moisture, provides an anchor for roots, and supplies most of the available nutrients. These three qualities are directly or indirectly affected by organic matter content, soil reaction (pH), fertility, drainage, texture, structure, depth, parent material, and landform position. The amounts of organic matter and soil moisture are increased in mountainous areas because of the higher elevations and cool aspects.

The ability of a soil to serve as a reservoir for moisture, as measured by the available water-holding capacity, is primarily influenced by texture, organic matter content, rooting depth, and content of rock fragments or mica. Because of uneven patterns of summer rainfall, the available water-holding capacity affects tree growth throughout most of Graham County. This is especially limiting on shallow and moderately deep soils, such as Soco, Junaluska, Tsali, Ditney, Unicoi, Cataska, and Sylco (fig. 30). For soils on steep uplands, much of the water movement during periods of saturation occurs as lateral flow down slope. As a result, soils on the lower slopes receive additional moisture due to internal water flow.

Average precipitation values fluctuate throughout the survey area, which can generally be divided into three regions. The western and southeastern parts of the county, near the Tennessee State line and the Cherokee County line, respectively, have the highest elevations and an average annual precipitation of about 82 inches. The central part, along the Cheoah Mountains, has slightly lower elevations and an average annual precipitation of about 72 inches. The northwestern part, near Topoco, has the lowest elevations and an average annual precipitation of about 60 inches.

All soils in the survey area, except for the shallowest, provide an adequate anchor for tree roots. The susceptibility to windthrow, or the uprooting of trees by the wind, is not a major management concern on most soils. Soils that have a moderate or severe windthrow hazard include Cataska, Ditney, Jeffrey, Junaluska, Soco, Sylco, and Unicoi.

The available supply of nutrients for tree growth is affected by several soil properties, including the organic matter content of the surface layer. The decomposition of organic matter into humus and the mineralization of humus release nitrogen and other nutrients, such as calcium, magnesium, and potassium, to plants.

Natural fertility is also dependent on the soil parent material and local geology. Most upland soils have been leached and contain only small amounts of nutrients below the surface layer. Only small amounts of nutrients are made available by the weathering of clay and silt particles. In general, most of the soils in Graham County have a good rooting depth, receive adequate rainfall, and are relatively productive. Exceptions are soils that formed over quartzite (such as Ditney and Unicoi soils) and metasandstone (such as Sylco and Cataska soils) in areas scattered throughout the county.

The living plant community is also part of the nutrient reservoir. The decomposition of leaves, stems, and other organic material recycles the nutrients that have accumulated in the forest ecosystem. Wildfire, excessive trampling by grazing livestock, and erosion result in the loss of these nutrients. Forestland management should include prevention of wildfires, erosion-control measures, and protection from overgrazing (fig. 31).

Table 9 and **table 10** can help forest owners or managers plan the use of soils for wood crops. They show the potential productivity of the soils for wood crops and rate the soils according to the limitations that affect various aspects of forest management.

In **table 9,** the *potential productivity* of merchantable or *common trees* on a soil is expressed as a site index and as a volume number. The *site index* is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that forest managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability. More detailed information regarding site index is available in the “National Forestry Manual,” which is available in the local office of the Natural Resources Conservation Service or on the Internet.

The *volume of wood fiber*, a number, is the yield likely to be produced by the most important tree species. This number, expressed as cubic feet per acre per year and calculated at the age of culmination of the mean annual increment (CMAI), indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

Trees to manage are those that are preferred for planting, seeding, or natural regeneration and those that remain in the stand after thinning or partial harvest.

This soil survey can be used to plan ways to increase and sustain the productivity of forestland. Some soils are more susceptible to landslides and erosion after roads are built and timber is harvested. Some soils require special reforestation efforts. In the section “Detailed Soil Map Units,” the description of each map unit in the survey area and its suitability for timber include information about productivity, limitations in harvesting timber, and management concerns in producing timber. In

Figure 31.—Wildfires can lead to a loss of topsoil and the sedimentation of waterways. Forestland management should include prevention of wildfires, use of erosion-control measures when logging, and protection from overgrazing.

table 10, parts I through V, interpretive ratings are given for various aspects of forest management. The ratings are both verbal and numerical.

Some rating class terms indicate the degree to which the soils are suited to a specified forest management practice. *Well suited* indicates that the soil has features that are favorable for the specified practice and has no limitations. Good performance can be expected, and little or no maintenance is needed. *Moderately well suited* indicates that the soil has features that are moderately favorable for the specified practice. One or more soil properties are less than desirable, and fair performance can be expected. Some maintenance is needed. *Poorly suited* indicates that the soil has one or more properties that are unfavorable for the specified practice. Overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration. *Unsuited* indicates that the expected performance of the soil is unacceptable for the specified practice or that extreme measures are needed to overcome the undesirable soil properties.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the specified forest management practice (1.00) and the point at which the soil feature is not a limitation (0.00).

Rating class terms for fire damage and seedling mortality are expressed as *low, moderate,* and *high*. Where these terms are used, the numerical ratings indicate gradations between the point at which the potential for fire damage or seedling mortality is highest (1.00) and the point at which the potential is lowest (0.00).

The paragraphs that follow indicate the soil properties considered in rating the soils for forest management practices. More detailed information about the criteria used in the ratings is available in the “National Forestry Manual,” which is available at the local office of the Natural Resources Conservation Service or on the Internet.

For *limitations affecting construction of haul roads and log landings*, the ratings are based on slope, flooding, permafrost, plasticity index, the hazard of soil slippage, content of sand, the Unified classification, rock fragments on or below the surface, depth to a restrictive layer that is indurated, depth to a water table, and ponding. The limitations are described as slight, moderate, or severe. A rating of *slight* indicates that no significant limitations affect construction activities, *moderate* indicates that one or more limitations can cause some difficulty in construction, and *severe* indicates that one or more limitations can make construction very difficult or very costly.

The ratings of *suitability for log landings* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, ponding, flooding, and the hazard of soil slippage. The soils are described as well suited, moderately suited, or poorly suited to use as log landings.

Ratings in the column *soil rutting hazard* are based on depth to a water table, rock fragments on or below the surface, the Unified classification, depth to a restrictive layer, and slope. Ruts form as a result of the operation of forest equipment. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that the soil is subject to little or no rutting, *moderate* indicates that rutting is likely, and *severe* indicates that ruts form readily.

Ratings in the column *hazard of off-road or off-trail erosion* are based on slope and on soil erodibility factor K. The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance. The hazard is described as slight, moderate, severe, or very severe. A rating of *slight* indicates that erosion is unlikely under ordinary climatic conditions; *moderate* indicates that some erosion is likely and that erosion-control measures may be needed; *severe* indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and *very severe* indicates that significant erosion is expected, loss of soil productivity and offsite damage are likely, and erosion-control measures are costly and generally impractical.

Ratings in the column *hazard of erosion on roads and trails* are based on the soil erodibility factor K, slope, and content of rock fragments. The ratings apply to unsurfaced roads and trails. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that little or no erosion is likely; *moderate* indicates that some erosion is likely, that the roads or trails may require occasional maintenance, and that simple erosion-control measures are needed; and *severe* indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed.

Ratings in the column *suitability for roads (natural surface)* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, ponding, flooding, and the hazard of soil slippage. The ratings indicate the suitability for using the natural surface of the soil for roads. The soils are described as well suited, moderately well suited, or poorly suited to this use.

Ratings in the columns *suitability for hand planting* and *suitability for mechanical planting* are based on slope, depth to a restrictive layer, content of sand, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, moderately well suited, poorly suited, or unsuited to these methods of planting. It is assumed that necessary site preparation is completed before seedlings are planted.

Ratings in the column *suitability for use of harvesting equipment* are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification, depth to a water table, and ponding. The soils are described as well suited, moderately well suited, or poorly suited to this use.

Ratings in the column *suitability for mechanical site preparation (surface)* are based on slope, depth to a restrictive layer, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 1 foot is considered in the ratings.

Ratings in the column *suitability for mechanical site preparation (deep)* are based on slope, depth to a restrictive layer, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 3 feet is considered in the ratings.

Ratings in the column *potential for damage to soil by fire* are based on texture of the surface layer, content of rock fragments and organic matter in the surface layer, thickness of the surface layer, and slope. The soils are described as having a low, moderate, or high potential for this kind of damage. The ratings indicate an evaluation of the potential impact of prescribed fires or wildfires that are intense enough to remove the duff layer and consume organic matter in the surface layer.

Ratings in the column *potential for seedling mortality* are based on flooding, ponding, depth to a water table, content of lime, reaction, salinity, available water capacity, soil moisture regime, soil temperature regime, aspect, and slope. The soils are described as having a low, moderate, or high potential for seedling mortality.

Recreation

The Graham County Chamber of Commerce, the Graham County Parks and Recreation Department, the Graham County Travel and Tourism Board, the Tennessee Valley Authority, and the U.S. Forest Service helped prepare this section.

The soils in Graham County play an important role in determining the suitability of land for recreational uses, such as picnic and camping areas, parks, ball fields, and golf fairways. Knowledge of soils is valuable in managing areas that have the potential for recreational development. Graham County and the towns of Bryson City and Cherokee are popular tourist destinations and offer many outdoor activities and scenic vistas in a rural mountain setting.

Graham County offers diverse recreational opportunities. The town of Robbinsville is on intermountain hills, on low mountains, in coves, on terraces, and on flood plains. Common soils in this area include Junaluska, Thurmont, Braddock, and Dillard. In contrast, the community of Topoco occurs on uplands, in coves, on flood plains, and in a river gorge. Common soils in this area include Junaluska, Brasstown, Tsali, Thurmont, Soco, Ditney, Spivey, Cullasaja, and Dellwood. Where cut and fill occurs, the map unit Udorthents-Urban land complex, 2 to 15 percent slopes, and the map unit Udorthents-Urban land complex, 15 to 95 percent slopes, have been mapped. These areas contain highways and right-of-ways, restaurants, craft shops, shopping plazas, hotels and motels, churches, schools, movie theaters, and other public attractions. Golf fairways are in coves, on flood plains, on ridgetops, and on side slopes. Greenways are dominantly on flood plains, in coves, and on terraces. Santeetlah and Lonon soils occur in coves, and Soco and Stecoah soils occur on mountain side slopes. Access points for white-water rafting and kayaking occur on flood plains where Dellwood and Reddies soils commonly occur (fig. 32). Rural communities often have recreational areas developed on flood plains, in areas where Dellwood soils are common. Public festivals annually recognize arts and crafts, Fourth of July celebrations, music and mountain culture, and folklore of the Southern Appalachian Mountains.

Elsewhere in the county, riding stables and trails, bed-and-breakfast inns, country clubs, private residences, and access roads are built in coves, on terraces, on intermountain hills, and on ridgetops and side slopes of low and intermediate mountains. Soils in these areas vary greatly depending on geology, aspect, and elevation. They commonly include Stecoah, Soco, Brasstown, Junaluska, Cheoah, and Snowbird soils on uplands and Lonon, Thurmont, Santeetlah, Spivey, and Whiteoak

Figure 32.—The Cheoah River, a major white-water attraction for kayaking and rafting, parallels Reddies and Dellwood soils on flood plains and Spivey and Santeetlah soils on colluvium slopes.

soils in coves. Rural communities often have recreational areas developed on flood plains where Dellwood and Cullowhee soils commonly occur.

The Nantahala National Forest makes up 113,026 acres in the western and eastern parts of Graham County, mostly along the Little Tennessee and Cheoah Rivers and in the watersheds of Santeetlah, Little Santeetlah, Snowbird, and Little Snowbird Creeks. It is the most intensively used recreational area in the county. Other attractions include the Cherohala Parkway, the Joyce Kilmer Memorial Forest, the Slickrock Wilderness Area, and Cheoah, Santeetlah, and Fontana Lakes. They offer picnicking; nature study; camping; trails for hiking, bicycling, and horseback riding; hunting; fishing; rafting; tubing; and scenic roadways. Several hundred miles of designated trout streams, with native and stocked trout, are on Federal lands. In addition, many of these areas are designated State Game Lands by the North Carolina Fish and Game Commission.

A walk through the Joyce Kilmer Memorial Forest is a journey back in time (fig. 33). The forest is a rare example of an old-growth, cove hardwood forest and is characterized by rich soils, abundant moisture, and a variety of plants, including towering trees as old as 450 years. Some enormous tulip poplars are more than 20 feet in circumference and stand 100 feet tall. The forest floor is carpeted with wildflowers, ferns, and moss-covered logs. The forest is a living memorial to Joyce Kilmer, who was killed in action during World War I and wrote poetry about nature. Kilmer's best known poem is "Trees."

While most of the surrounding land was logged, the area around Little Santeetlah Creek was spared. A grove of the forest's largest trees was protected by the recognition of its uniqueness and the drastic drop of lumber prices after the crash of 1929. In 1935, the regional forester recommended the purchase of the forest because it was one of very few remaining tracts of virgin hardwood in the Appalachians. The following year, the U.S. Forest Service bought 13,055 acres to preserve some of the finest original growth in the Appalachians.

The Appalachian Trail and miles of other trailheads wind their way through Graham County's mountain valleys and along its ridges. Twenty-nine miles of the Appalachian

Trail pass through the county, crossing the Nantahala River at Wesser in the south, climbing to 5,062 feet at Cheoah Bald, then traveling north over the high ridges of the Cheoah Mountains. The trail crosses Fontana Dam along the northern end of the country, from where it transverses the entire backbone of the Great Smoky Mountains National Park.

The Cherohala Skyway, traveling from Robbinsville, North Carolina to Tellico Plains, Tennessee, is one of the newest scenic roads in the United States. The more than 40 miles of spectacular roadway, which took more than 30 years to build, is quickly becoming a favorite touring road, earning it the nickname of “The Mile High Ride.” The scenic byway gets its name from, and travels through, the Cherokee and Nantahala National Forests. It was originally a Native American trading route before it became a wagon train road for early settlers. The peak of this state-of-the-art road is at an elevation of 5,390 feet.

A drive down the Cherohala Skyway is slow paced and relaxing. The views and scenery along the route make this region unique (fig. 34). They include the virgin landscape of the Joyce Kilmer Memorial Forest, the Slickrock Wilderness Area, and the Santeetlah Valley in the southwestern Blue Ridge Mountains. The skyway provides access to coves; low, intermediate, and high mountain ridgetops; and side slopes. The most common soils are Spivey, Santeetlah, Cheoah, Jeffrey, Soco, Stecoah, Sylco, and Cataska. The skyway is managed by the U.S. Forest Service.

The Great Smoky Mountains National Park is located in the north and east parts of Graham County along Fontana Lake’s north shore. It is the most visited park in the National Park System and has some of the highest peaks in the eastern United States. Part of the park’s appeal is its diversity in elevation, wildlife, and vegetation.

Figure 33.—The Joyce Kilmer Memorial Forest is a rare example of an old-growth hardwood forest. The dominant cove soils in this area are Spivey, Whiteoak, and Santeetlah.

Figure 34.—Cherohala Skyway, a popular scenic highway, traverses intermediate and high mountains and crosses diverse plant communities and soil types.

The park boasts 850 miles of hiking trails and paths, including the 70 miles making up the Appalachian Trail. Numerous recreational opportunities attract thousands of people each year to this park. The use and management of recreational areas is affected by the soils and their unique properties.

Soils in the national forest vary in their ability to support recreational development. Soils on the intermediate and high mountains, such as Cheoah, Snowbird, Luftee, and Anakeesta, have thick surface layers that have a high content of organic matter and are subject to compaction and severe erosion when disturbed by machinery or where trails are built. Cove soils, such as Spivey and Northcove, have a large amount of stones and boulders that limit recreational development. Because Sylco, Cataska, Ditney, and Unicoi soils have bedrock near the surface and are associated with rock outcrops, they are limited for most recreational uses. The building of trails, access roads, and camp areas may require special design to overcome any site limitations.

Fontana and Cheoah Lakes are federally owned or controlled by the Tennessee Valley Authority (TVA) and were created to improve navigation, flood control, electricity generation, and economic development in the Tennessee River watershed. Santeetlah Lake, whose shoreline is managed by the U.S. Forest Service provides hydro power to a manufacturer in an adjacent State.

These lakes offer many recreational opportunities. Today, boat docks and launching ramps are located in a number of places to provide lake access to the scores of visitors (fig. 35). Many types of fish are abundant in the reservoirs, including rainbow trout, brown trout, brook trout, steelhead trout, largemouth bass, smallmouth bass, sunfish, perch, walleye, and crappie. A number of popular fishing tournaments are held on Fontana Lake, attracting droves of enthusiastic fishermen from around the country. Fans of water sports enjoy swimming and skiing; boaters enjoy sailing, motorboats, pontoons, houseboats, and jet skis.

The soils of the survey area are rated in **table 11, parts I and II** according to limitations that affect their suitability for recreation. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Slightly limited* indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings in the table are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

Figure 35.—Santeetlah Lake (shown), Fontana Lake, and Cheoah Lake are important to the local economy, offer numerous recreational opportunities, and are accessible by area boat docks and launch ramps.

The information in **table 11** can be supplemented by other information in this survey, for example, interpretations for building site development, construction materials, sanitary facilities, and water management.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas.

The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Playgrounds require soils that are nearly level, are free of stones, and can withstand intensive foot traffic. The ratings are based on the soil properties that affect the ease of developing playgrounds and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of playgrounds. For good trafficability, the surface of the playgrounds should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The properties that affect plant growth are reaction, depth to a water table, ponding, depth to bedrock or a cemented pan, the available water capacity in the upper 40 inches, and the content of sulfidic materials.

Paths and trails for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

Off-road motorcycle trails require little or no site preparation. They are not covered with surfacing material or vegetation. Considerable compaction of the soil material is likely. The ratings are based on the soil properties that influence erodibility, trafficability, dustiness, and the ease of revegetation. These properties are stoniness, slope, depth to a water table, ponding, flooding, and texture of the surface layer.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; and the content of sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer. The suitability of the soil for traps, tees, roughs, and greens is not considered in the ratings.

Wildlife Habitat

Patrick Farrell, wildlife biologist, North Carolina Wildlife Resources Commission, and biologists of the Natural Resources Conservation Service, Raleigh, helped prepare this section.

Soils are a major factor in determining the amount and distribution of food, water, and cover available for wildlife. The many soils of Graham County provide a diversity of wildlife habitat that can support many wildlife species. Soils affect the kind and amount of vegetation available to wildlife as food and cover. They also affect the construction of water impoundments and the presence of seeps and springs.

Knowledge of soil types and the plant communities that they support is valuable in managing wildlife. Generally, wildlife occupies the soils that are the most suitable for their habitat, that provide food, water, and cover requirements. Yet, soils that have a good potential for wildlife do not always support a large population of wildlife. Human activities can force wildlife onto soils that support less desirable habitat. This can adversely affect the kinds and numbers of wildlife.

Understanding soil-vegetation relationships is important in creating and maintaining productive wildlife habitat areas. Soil surveys can be used in management programs, such as habitat improvement, species reintroduction, and creation of wildlife refuges. A variety of habitat for a variety of wildlife is an important objective in wildlife management. The needs of wildlife habitat should be considered in all decisions involving land use and management.

The soils of the county support vast areas of woodland wildlife habitat. Many areas of woodland have immature mixed hardwoods that produce a variety of hard and soft mast. Black bear, white-tailed deer, wild boar, turkey, gray squirrel, and woodpeckers benefit from such habitat. On the warm, south- to west-facing aspects, Brasstown, Junaluska, Soco, and Stecoah soils support a plant community consisting of oaks, hickory, dogwood, pine, and mountain laurel. On the cooler, north- to east-facing aspects, Cheoah, Jeffrey, and Snowbird soils support a plant community consisting of yellow-poplar, American beech, black cherry, and rhododendron. Areas of Ditney, Unicoi, Sylco, and Cataska soils that typically occur with rock outcrop support many varieties of lichens, grasses, and forbs. The many twisted and dead trees associated with these areas serve as important den and nesting places for woodland wildlife. The remoteness of these areas also provides refuge for wildlife.

The availability of water and cover are key elements in wildlife habitat. Soils in coves, such as Lonon, Santeetlah, Spivey, and Whiteoak, have a cool, moist environment and frequently are near seeps, springs, or streams. Boulders, stones, or dense thickets of rhododendron in areas of these soils also provide cover for wildlife. Raccoon and ruffed grouse frequent these areas for food and cover. Salamanders and other amphibians benefit from the moisture in the coves. Soils in coves on warm, south- to west-facing aspects contribute to wildlife habitat by providing moisture and a diversity of plants to an otherwise uniform plant community.

Wetlands in woodland along the larger rivers and streams contribute to habitat diversity. Timber stands on Cullowhee, Dellwood, and Reddies soils host wetland inclusions. These areas support dense plant cover. A variety of wildlife utilize these areas.

The cool-water streams of the county support brook trout, brown trout, and rainbow trout. Largemouth bass, bluegill, crappie, and other sunfish are dominant in warm-water lakes and ponds. Due to the diversity of the aquatic habitat, Fontana Lake and the Little Tennessee River System offer a large variety of fish. Fish include smallmouth bass, largemouth bass, black bass, white bass, spotted bass, walleye, bluegill, catfish, bream, crappie, and muskellunge.

The severe climate at high elevations limits the potential for diversity among tree species. Soils such as Luftee and Anakeesta support yellow birch, sweet birch, and northern red oak. They also support small stands of red spruce and Fraser fir where red squirrel and several less common species of salamander live. The soils at high elevations support many varieties of soft mast, forbs, and grasses, especially on balds and in open areas. Black bear, wild boar, ruffed grouse, and white-tailed deer utilize these areas (fig. 36). Hawks and other birds of prey use the open areas for hunting.

The size and remoteness of the habitat at the higher elevations is critical in some wildlife management programs. These areas are becoming increasingly important to species that require large tracts of habitat, such as black bear. The unique grassy balds in areas of Breakneck, Pullback, Luftee, and Anakeesta soils provide open areas for wildlife. Shallow, rocky crags in areas of rock outcrop have provided suitable habitat for the reintroduction of the endangered peregrine falcon.

Many open areas are the result of human activities. Generally, open spaces in the county occur on the less sloping landscapes at the lower elevations. The complex soil and vegetation patterns associated with these open areas can provide the most habitat diversity when suitable woodland cover is nearby. These areas are also used for a variety of human activities, including agricultural, residential, industrial, and recreational development. Most of these activities preclude use of the land by many wildlife species.

These human activities force wildlife, especially large game, to move to less desirable soils, which support less desirable habitat and thus smaller wildlife populations. Soils that have good potential for providing wildlife habitat do not necessarily support a viable wildlife population. For example, Reddies, Lonon, Whiteoak, and Brasstown soils have good potential as wildlife habitat but are intensively used for farming and housing, which forces wildlife elsewhere. Other soils, such as Soco, Stecoah, and Cheoah, also have good potential as wildlife habitat and most of their acreage is in woodland. Areas of these soils, however, once cleared for pasture are often left accessible to cattle, which are very competitive with wildlife for food.

Wildlife habitat can be created and improved by planting vegetation, maintaining existing plant cover, and promoting the natural establishment of desirable plants. In open areas, soil conservation measures, such as field borders and vegetative filter strips, provide needed food and cover. Establishing plant cover along access roads helps to provide food for wildlife and assists in preventing the sedimentation of lakes and streams. Wildlife can often be seen at dusk and dawn in the fields and woodlands bordering roads.

Many woodland management techniques can be used to increase the potential for wildlife habitat. Openings in the forest canopy encourage plant diversity and subsequently increase the potential for wildlife habitat for many species. In areas of timber or firewood cutting, some snags and older trees should be left for cavity nesters, such as woodpeckers, and for raccoons and squirrels, which need den sites. Unusually large trees, uncommon tree species, and some mast-bearing trees and shrubs should also be left. Keeping well dispersed groups of different-aged timber stands that have a variety of tree species is a key to overall benefits for wildlife.

The wildlife habitat in Graham County is greatly enhanced by a reservoir of managed and protected Federal lands. The collective acreage provides a stable habitat that is protected from development. The Great Smoky Mountains National Park is a sanctuary for a magnificent array of animal and plant life, all of which is protected for future generations to enjoy. From the big animals, such as wild boar, bear, white-tailed deer, and turkey, down to microscopic organisms, the Smokies may be the most biologically diverse area in the world’s temperate zone.

Figure 36.—Black bear and ruffed grouse benefit from a productive wildlife habitat that has diverse plant communities.

Engineering

Howard Tew, civil engineer (retired), Natural Resources Conservation Service, helped prepare this section.

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the “Soil Properties” section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations must be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water-holding capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earth fill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are described in the Glossary.

The soils in Graham County occur on various landscapes, from flood plains and gently sloping terraces to mountaintops at elevations of more than 6,000 feet. These soils are used for a wide range of purposes, from vegetable crop production to construction of multi-unit housing. Soils in many areas of the county may be easily developed using conventional engineering design techniques. Others require specialized engineering and construction techniques to overcome their inherent

Figure 37.—An area of soil slippage. Soil maps and onsite investigations can be used to effectively evaluate soil and bedrock characteristics which may require engineering complexities and additional expense for construction and maintenance.

limitations. Any plans for engineering activities must consider the limitations of the soils to avoid construction problems.

In order to effectively evaluate soils for engineering or construction purposes, the factors which limit soils use must be considered. In Graham County there are a number of soil-site characteristics which pose engineering difficulties. Among the most important are slope, erodibility, instability (poor bearing strength and/or shear strength), shrink-swell potential, stoniness, depth to bedrock, freeze-thaw cycle, hydrology, and organic matter content (fig. 37).

Rainfall runoff from steep watersheds results in high peak rates and flow velocities in receiving streams. The design of impoundment structures must meet exacting standards in order to control the high runoff from these watersheds. Ponds, sediment basins, and waterways are likely to be damaged or may wash out if construction design does not address the complications caused by steep slopes. Downstream damages and subsequent liability should a failure occur are the consequences of a poor design.

Erodibility.—Erosion control on steep slopes presents a unique challenge. During construction, surface cover is removed, exposing soil to erosion. Piles of soil around a construction site have no resistance to erosional forces. Whenever runoff is allowed to accumulate and move across construction sites uncontrolled, severe erosion occurs. Excavations on sloping mountain soils result in severe erosion and offsite sediment damage unless adequate erosion-control measures have been used (fig. 38).

Cuts on mountainsides generally result in high fills with steep and very steep slopes. Construction which requires significant cuts and fills on mountain side slopes calls for careful erosion control. Typically, fill slopes are dominated by saprolite and rock fragments. Saprolite can be very erosive, droughty, infertile, and very strongly acid to extremely acid. These characteristics make it difficult to stabilize the slope with vegetation.

Figure 38.—Sediment basins and silt fences should be installed before land-disturbing activities begin. Properly installed erosion-control measures help to keep sediments on site and maintain water quality.

Soils with very low pH are commonly associated with geologic formations containing a high amount of sulfur-bearing rock, such as black slate, and pose an environment hazard. Disturbance of the bedrock, whether from natural causes or construction activities, risks exposing fresh iron pyrite to weathering and releasing sulfur into the environment. The sulfur becomes sulfuric acid, which rapidly lowers the pH in streams, adversely affecting aquatic life. Onsite investigations are critical to determine the presence of sulfur-bearing rock material. If this material is present, another site should be selected as areas of this material are nearly impossible to stabilize (fig. 39).

Fill slopes for which compaction is not carefully monitored and controlled usually have low density and high porosity. As water moves through a fill slope, settling occurs. As the pores fill with water, the fill slope gets heavier. This causes piping, differential settling, severe slope failure, and offsite sediment damage. Generally, soils with a mica content are underlain by micaceous saprolite. Fill slopes containing micaceous saprolite have slope failure at a lower water content than fill slopes that do not contain a high amount of mica.

Instability.—In order to support loads, such as high fills, buildings, and vehicular traffic, undisturbed soils must possess an inherent bearing strength. Undisturbed sloping soils must also provide a degree of shear strength in order to support their own weight. Additional loading puts a greater stress on the soil. When loading stresses exceed bearing or shear strength, soils move unpredictably. Loading stresses exceed bearing and/or shear strengths more quickly on soils that have a significant content of mica or on soils derived from metasedimentary rock. Any excavation cut across the slope of these soils removes the lateral support holding the soil in place. Over time the weight of the soil above the cut may cause downslope movement, which damages roads and structures.

Soils, like machines, move more freely when lubricated. Such lubrication occurs in soils where there are high concentrations of mica. Mica can be detected in soil by a slick greasy feel and by a shiny sparkle when struck by bright light. Water also is a soil lubricant. When a soil becomes saturated with water, it tends to move away from the applied loading forces.

Whether lubricated by natural soil particle characteristics or by water, soil that moves provides very little shear strength. Areas of micaceous soils or soils subject to seeps and springs are poor choices for construction sites due to poor strength manifested by downslope movement. Areas of soils in coves and on toeslopes, such as Lonon, Northcove, Spivey, and Santeetlah, have areas of seeps and springs.

Landscapes in Graham County may be unstable because of their metasedimentary geologic origin. Underlying bedrock, with layers nearly parallel to the natural slope, may be unstable. Tsali, Sylco, Cataska, Luftee, and Anakeesta soils are examples of soils that may have formed over such geologies. Rock with a thinly bedded structure pattern provides very little support, has low shear strength, and tends to slide when subjected to bearing a load. Weathered materials from these rocks are generally flatter and typically slide after winter freeze and thaw cycles or during periods of rain. Excavation cuts across the slopes in areas of soils with this bedrock structure remove the lateral support holding upslope material in place. Over time, the mass of soil and rock above the cut may cause downslope movement, possibly damaging roads and structures.

Reddies and Dellwood soils occur on flood plains along the Little Tennessee and Cheoah Rivers and their tributaries. These soils are composed predominantly of fine to coarse sands and silts. They have little natural plasticity and may become unstable when excavated. The soil particles are not bound together by the adhesive properties of clay and will flow when subjected to excessive loading while wet. Excavations in these soils are difficult and can be dangerous. In addition, side walls tend to cave in and slough off when lateral support is removed. Extensive shoring of excavation pits and walls is needed if cave-ins are to be prevented.

Figure 39.—Sulfur-bearing rock is nearly impossible to stabilize once disturbed. In the left photo is a road cut still devoid of vegetation after 30 years. Constant weathering exposes fresh iron pyrite. In the right photo are acidic (pH as low as 2) effluent seeps from a highway cut slope that, over time, dissolve concrete and steel in storm water drainage systems and harm aquatic organisms.

Shrink-swell potential.—Braddock and Unison soils on terraces and in coves have a type of clay that has a moderate shrink-swell potential. Shrinking and swelling cause soil to push against foundations and buried pipes. Over time, foundations crack and pipes break. Special planning and design of footings, foundations, and underground utilities may be required before construction begins.

Stoniness.—Most mountain soils contain rock fragments. These fragments range in size from gravel to boulders. Soils are classified as skeletal when at least 35 percent of their volume is rock fragments. Skeletal soils are limited for engineering uses due to the rock content and need special designs to overcome the limitations. Cove soils, such as Spivey and Northcove, are skeletal. Other cove soils have fewer stones in the profile, such as Lonon, Whiteoak, and Thurmont soils. Flood plain soils are underlain by smooth, water-rounded rocks ranging from fine gravel to boulders. Dellwood soils are skeletal beginning at a depth of 10 to 20 inches. Reddies and Cullowhee soils have 20 to 40 inches of non-skeletal material above the skeletal layer.

The content of rock fragments in residual soils, such as Stecoah, Soco, Brasstown, and Junaluska, varies from only a few fragments to as much as 35 percent of the soil volume. A soil can vary in content of rock fragments from place to place and even within the soil profile. Construction and development require the compaction of fill material to provide firm foundations and impervious layers. An excess content of rock fragments in fill material inhibits compaction. Unacceptable settlement is likely to occur, resulting in damage to roads, buildings, and other structures. Compaction of rocky soils fails to produce the homogenous density required in the construction of earth dams and other water-retention structures. Shallow excavations and fine grading may be difficult in areas of excessively stony soils.

When analyzing soils for engineering purposes, the content of rock fragments should receive special emphasis. One must take into account the fact that the Unified Soil Classification System (USCS) evaluates textures only for that fraction of the soil passing the No. 200 sieve (grain size 0.074 millimeter and less). The USCS texture for a specific soil may be shown as SC (sand with clay fines) or CL (low-plastic clay). This indicates that the soil is ideal for fill material and will respond acceptably to compaction but may contain rock fragments too large to pass the No. 200 sieve, rendering the soil unsuitable for use as fill. The pedon descriptions in the “Classification of Soils” section can be used to identify excessive stoniness. An onsite investigation may be necessary in order to determine actual conditions.

Depth to bedrock.—Hard bedrock is at a depth of 10 to 40 inches in Ditney and Unicoi soils. It is indicated in the pedon descriptions of these soils by the horizon designator “R.” Soco and Junaluska soils have weathered bedrock at a depth of 20 and 40 inches. Stecoah and Brasstown soils have weathered bedrock at a depth of 40 to 60 inches. Weathered bedrock is indicated in the pedon descriptions in the “Classification of the Soils” section by the horizon designator “Cr.”

Hard bedrock cannot be excavated with machinery unless highly fractured. Weathered bedrock can be excavated with machinery. The relative hardness of weathered bedrock generally increases as depth increases. Soft, weathered bedrock which can be easily excavated at a depth of 4 feet may become hard and unrippable at a depth of 8 feet. The surfaces of these restrictive features are undulating, and onsite investigations are needed to determine the bedrock topography before construction begins. Material excavated from weathered bedrock is dry, brittle, and hard to pack.

Freeze-thaw cycles.—The soils in Graham County located on south- and west-facing slopes are exposed to continual freezing and thawing from November to March. Examples are Soco, Stecoah, Junaluska, and Brasstown soils. These soils are susceptible to heaving. Frost action loosens the surface of the soil and heaves it above its normal position. Subsequent thawing may leave the soil surface in a near liquid state. In this condition the soil is subject to erosion and has little load-supporting strength. On unprotected slopes, erosion occurs and access roads become impassable. At times a thaw may not affect all of the frozen soil. When this happens an unfrozen, heaved layer of soil is on top of the frozen soil. When soil is in this condition, severe erosion can occur as water moves across the top of the frozen soil. A soil surface cover such as mulch, vegetation, or gravel can minimize the effects of freezing and thawing.

Frost heaving exerts considerable force on footings and foundations. In designing structures, damage from potential frost heave must be considered. Frozen soil resists compaction and should not be used in fill material when compacted densities are important. Depth of frost penetration varies with elevation and aspect across the county. Soils on north-facing slopes develop frost to greater depths than those on south-facing slopes but their freeze-thaw cycle is not as often. Frost penetration may exceed a depth of 24 inches in some years at the higher elevations.

Soil water affects most of the other engineering characteristics of soils already discussed. However, water by itself can limit engineering uses of soils in many ways. Dellwood, Reddies, Cullowhee, and Ela soils occur on flood plains. Ela soils are frequently flooded, and the rest are occasionally flooded. Dillard, Hemphill, and Statler soils are on low terraces that are rarely flooded. Any structure may be damaged in a flood. It is best not to use these soils for urban development, except possibly for ball fields and playgrounds.

Santeetlah, Spivey, Northcove, Lonon, and Thurmont soils in coves and Dillard and Hemphill soils on low terraces are in areas with seeps and springs located underground or at the surface. Excavations in these soils may cut into underground water flows, flooding the hole. Special engineering design is needed to divert the water away from the structure.

Overland flow is a serious water problem on mountain land. Any access road, building, or other structure developed on a mountainside requires a design that diverts surface runoff away.

Hydrology.—Cullowhee, Reddies, and Dellwood soils have water tables close enough to the surface that they limit development. Since these soils flood, land use should be limited to agricultural and recreational uses.

Organic matter content.—Spivey, Santeetlah, Cheoah, Jeffrey, Snowbird, Dellwood, and Reddies soils have a high content of organic matter in the surface layer which causes low soil strength for bearing loads. On these soils, access roads and construction sites where equipment moves across the surface will be of low quality unless the topsoil is removed or surfaced. It is best to remove the organic-rich topsoil and stockpile it for use during the final grading before allowing machinery to travel across the land.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations. Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. **Table 12, parts I and II** show the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, shallow excavations, and lawns and landscaping.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Slightly limited* indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Access Roads

Establishing and maintaining access roads in Graham County has always been difficult. Sedimentation from roads is the largest source of non-point pollution in the survey area. A new road is often built along the path of an old one and past errors are repeated. Currently, road construction in the mountains is at an unprecedented high level. Landowners are reopening old roads to provide access to woodlots and intermittently used farmland. Roads are opened or built each year for logging on private and government-owned lands. The largest effort in road construction, however, is to provide access to real estate developments. In all of these situations, the design of a low-cost, nonpolluting, and essentially self-maintaining road is needed (fig. 40).

The U.S. Forest Service has supported research and demonstrations on design for forest access roads for more than 50 years at the Coweeta Hydrologic Laboratory in the Nantahala Mountains in Macon County, North Carolina. Early work demonstrated methods of roadbank stabilization that use brush and native grasses or weed species. Through a series of logging demonstrations, the design of a minimum standard, intermittent-use road was developed and tested. Features of this design apply to both seldom used and development access roads and are as follows:

1. Soils and geology are identified on maps, and site selection and/or construction practices are modified where unstable conditions are located.

2. All exposed soil is revegetated as construction proceeds.

3. The siltation of permanent and intermittent streams is reduced by maintaining a filter strip of undisturbed soil between the road and the stream channel and by building at right angles across channels, always using bridges, open pipe, or stream-crossing fords with geotextile and gravel.

4. Vegetation and brush that are cut from the right-of-way are piled below the roadway prior to construction. This barrier intercepts sediment-laden storm water or slows its movement down slope.

5. A covering is provided for loose soil in fills to help control erosion at critical points, such as stream crossings and dip outlets. Mulch netting or scattered branches, brush, cut weeds, or grass help to protect the soil until new grass is established.

6. Surface water is removed from the roadbed by out-sloping and broad-based dips and inside ditches. (In-sloped roads with ditches and culverts are recommended by the Natural Resources Conservation Service for heavily used areas.)

7. Broad-based dips, which are short sections of reverse grade, intercept storm water and divert it off the roadbed. Dips are spaced about 200 feet apart and placed where they can divert water away from stream crossings or steep grades.

8. Maximum grade is restricted to 8 percent wherever possible.

9. Where roadbeds are not graveled, grass is planted on the entire roadway. Although traffic may kill grass in part of the roadbed, the rest of the roadbed will remain protected against erosion. Gravel is used on the steeper grades, on problem soils, or in high-traffic areas. Large, washed rock (3 inch nominal diameter) provides

Figure 40.—A properly designed, constructed, and maintained access road minimizes soil erosion and allows year-round use. Broad-based dips, or water bars, shorten the length of slopes and help to control surface runoff.

an effective erosion-control pavement on light-traffic roads. Gravel bonds best to the roadbed if it is added immediately after construction, when the soil is loose.

10. Required maintenance for access roads is increased by traffic in winter and early spring, when the soils are wet and soft. If traffic can be controlled, the annual mowing of grass and brush, supplemented by the periodic cleaning of dip outlets, may be the only maintenance needed. Areas of greater traffic may require that the roadbed be smoothed every 5 to 10 years and the grass and gravel replaced. Areas of heavy year-round traffic require that the road be upgraded and receive scheduled maintenance.

The road design developed and tested at Coweeta Hydrologic Laboratory has influenced Federal, State, and forest industry guidelines and has helped to minimize erosion and the impact on water quality.

In 2005, the Natural Resources Conservation Service published the booklet “The Layman’s Guide to Private Access Road Construction in the Southern Appalachian Mountains,” second edition (available at http://www.hrwc.net/laymans_guide_to_access_road.pdf). This booklet provides information to home builders and developers on building access roads while minimizing cost and environmental impact. One should consider the detailed information given in the description of each soil in the “Detailed Soil Map Units” section and in the tables. More specific information can be obtained from the local office of the Natural Resources Conservation Service or the Graham Soil and Water Conservation District.

Sanitary Facilities

Table 13, parts I and II show the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, sanitary landfills, and daily cover for landfill. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Slightly limited* indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Soil permeability is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a permeability rate of more than 2 inches per hour are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

A *trench sanitary landfill* is an area where solid waste is placed in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil excavated at the site. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill. The ratings in the table are based on the soil properties that affect the risk of pollution, the ease of excavation, trafficability, and revegetation. These properties include permeability, depth to bedrock or a cemented pan, depth to a water table, ponding, slope, flooding, texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, onsite investigation may be needed.

Hard, nonrippable bedrock, creviced bedrock, or highly permeable strata in or directly below the proposed trench bottom can affect the ease of excavation and the hazard of ground-water pollution. Slope affects construction of the trenches and the movement of surface water around the landfill. It also affects the construction and performance of roads in areas of the landfill.

Soil texture and consistence affect the ease with which the trench is dug and the ease with which the soil can be used as daily or final cover. They determine the workability of the soil when dry and when wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact and are difficult to place as a uniformly thick cover over a layer of refuse.

The soil material used as the final cover for a trench landfill should be suitable for plants. It should not have excess sodium or salts and should not be too acid. The surface layer generally has the best workability, the highest content of organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

In an *area sanitary landfill*, solid waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site. A final cover of soil material at least 2 feet thick is placed over the completed landfill. The ratings in the table are based on the soil properties that affect trafficability and the risk of pollution. These properties include flooding, permeability, depth to a water table, ponding, slope, and depth to bedrock or a cemented pan.

Flooding is a serious problem because it can result in pollution in areas downstream from the landfill. If permeability is too rapid or if fractured bedrock, a fractured cemented pan, or the water table is close to the surface, the leachate can contaminate the water supply. Slope is a consideration because of the extra grading required to maintain roads in the steeper areas of the landfill. Also, leachate may flow along the surface of the soils in the steeper areas and cause difficult seepage problems.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste. The ratings in the table also apply to the final cover for a landfill. They are based on the soil properties that affect workability, the ease of digging, and the ease of moving and spreading the material over the refuse daily during wet and dry periods. These properties include soil texture, depth to a water table, ponding, rock fragments, slope, depth to bedrock or a cemented pan, reaction, and content of salts, sodium, or lime.

Loamy or silty soils that are free of large stones and excess gravel are the best cover for a landfill. Clayey soils may be sticky and difficult to spread; sandy soils are subject to wind erosion.

Slope affects the ease of excavation and of moving the cover material. Also, it can influence runoff, erosion, and reclamation of the borrow area.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. It should not have excess sodium, salts, or lime and should not be too acid.

Construction Materials

Table 14, parts I and II give information about the soils as potential sources of gravel, sand, reclamation material, roadfill, and topsoil. Normal compaction, minor processing, and other standard construction practices are assumed.

Gravel and *sand* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In **table 14, part I,** only the likelihood of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the bottom layer of the soil contains sand or gravel, the soil is considered a likely source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness.

The soils are rated *good, fair,* or *poor* as potential sources of sand and gravel. A rating of *good* or *fair* means that the source material is likely to be in or below the soil. The bottom layer and the thickest layer of the soils are assigned numerical ratings. These ratings indicate the likelihood that the layer is a source of sand or gravel. The number 0.00 indicates that the layer is a poor source. The number 1.00 indicates that the layer is a good source. A number between 0.00 and 1.00 indicates the degree to which the layer is a likely source.

In **table 14, part II,** the rating class terms are *good, fair,* and *poor*. The features that limit the soils as sources of these materials are specified in the table. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of reclamation material, roadfill, and topsoil. The lower the number, the greater the limitation.

Reclamation material is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Ponds and Embankments

Table 15 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the saturated hydraulic conductivity (Ksat) of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. Embankments that have zoned construction (core and shell) are not considered. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey.

Soil properties are ascertained by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine particle-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties are shown in tables. They include engineering index properties, physical and chemical properties, and pertinent soil and water features.

Engineering Index Properties

Table 16 gives the engineering classifications and the range of index properties for the layers of each soil in the survey area.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. “Loam,” for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, “gravelly.” Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 1998) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 1998).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of particle-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is generally omitted in the table.

Physical Soil Properties

Table 17 shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In **table 17**, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $^1/_3$- or $^1/_{10}$-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability (Ksat) refers to the ability of a soil to transmit water or air. The term “permeability,” as used in soil surveys, indicates saturated hydraulic conductivity (Ksat). The estimates in the table indicate the rate of water movement, in inches per hour, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at $^{1}/_{3}$- or $^{1}/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In **table 17**, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in **table 17** as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Chemical Soil Properties

Table 18 shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Cation-exchange capacity is the total amount of extractable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Effective cation-exchange capacity refers to the sum of extractable cations plus aluminum expressed in terms of milliequivalents per 100 grams of soil. It is determined for soils that have a pH of less than 5.5.

Soil reaction is a measure of acidity or alkalinity. The pH of each soil horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Water Features

Table 19 gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

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

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

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

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a 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.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

The *months* in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. **Table 19** indicates, by month, depth to the top (*upper limit*) of the saturated zone in most years. Estimates of the upper limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. **Table 19** indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Soil Features

Table 20 gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness of the restrictive layer, which significantly affects the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Soil slippage potential indicates the possibility that a mass of soil will slip when the vegetation is removed and soil water is at or near saturation or when the slope is undercut. Saturating a slope with water from altered drainage or irrigation has an effect on slippage. Soil slippage potential is an important consideration for engineering practices, such as the construction of roads and buildings, and for forestry practices.

The classes for soil slippage potential are estimated by observing slope; lithology, including contrasting lithologies; strike and dip; surface drainage patterns; and occurrences of such features as slip scars and slumps. The following classes are used: *high* (unstable); *medium* (moderately unstable); and *low* (slightly unstable to stable).

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low, moderate,* or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (USDA-NRCS, 1999 and 2010). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. **Table 21** shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Ultisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Udult (*Ud*, meaning humid, plus *ult*, from Ultisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hapludults (*Hapl*, meaning minimal horizonation, plus *udult*, the suborder of the Ultisols that has a udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Hapludults.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle size, mineral content, soil temperature regime, soil depth, and reaction. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine, mixed, semiactive, mesic Typic Hapludults.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, which is typical of the series in the survey area, is described. The detailed description of each soil horizon follows standards in the “Soil Survey Manual” (USDA-NRCS, 1993). Many of the technical terms used in the descriptions are defined in “Soil Taxonomy” (USDA-NRCS, 1999) and in “Keys to Soil Taxonomy” (USDA-NRCS, 2010). Unless otherwise indicated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series. The map units of each soil series are described in the section “Detailed Soil Map Units.”

Alarka Series

Depth class: Very deep
Drainage class: Poorly drained
Depth to seasonal high water table: 1.0 foot or less from January through December
Permeability: Moderately slow or slow in the upper horizons and moderately rapid in the lower horizons
Parent material: Colluvium and underlying alluvium derived from low-grade metasedimentary rock
Landscape: Intermediate mountains, dominantly in the southeastern part of the county
Landform: Hanging coves
Landform position: Planar to slightly concave toeslopes and bottomland slopes, in the upper reaches of watersheds
Slope range: 0 to 8 percent
Taxonomic classification: Fine-loamy over sandy or sandy-skeletal, mixed, active, mesic Aeric Epiaquults

Typical Pedon

Alarka loam in an area of Alarka-Wesser complex, 0 to 8 percent slopes, occasionally flooded; in Swain County, North Carolina; about 7.0 miles south of Whittier in Alarka Creek watershed, from Whittier on Secondary Road 1173 to Secondary Road 1193, west on Secondary Road 1193 to Secondary Road 1177, south on Secondary Road 177 to U.S. Forest Service Road 86, south on U.S. Forest Service Road 86 to Wesser Gap, about 1.1 miles from Wesser Gap on U.S. Forest Service Road 86, about 150 feet west of the road, along a small branch; USGS Alarka Creek topographic quadrangle; lat. 35 degrees 20 minutes 6 seconds N. and long. 83 degrees 21 seconds 18 minutes W. (A representative map unit for Graham County is on USGS Marble topographic quadrangle; lat. 35 degrees 13 minutes 46 seconds N. and long. 85 degrees 58 minutes 43 seconds W.)

Oe—0 to 3 inches; moderately decomposed organic litter and root mat; extremely acid; clear wavy boundary.
Oa1—3 to 7 inches; highly decomposed organic litter and root mat; many fine and coarse roots; ultra acid; clear irregular boundary.
Oa2—7 to 10 inches; highly decomposed organic litter and root mat; common fine to coarse roots; ultra acid; clear irregular boundary.
Btg—10 to 13 inches; brown (7.5YR 5/2) loam; weak medium subangular blocky structure; friable; slightly sticky, slightly plastic; few medium and coarse roots; few faint clay films on ped faces; many medium and coarse prominent strong brown (7.5YR 5/8) irregularly shaped soft masses of iron accumulation throughout; black (10YR 2/1) organic matter accumulations 1 to 5 centimeters thick in root channels throughout 10 percent of the horizon; few fine mica flakes throughout; extremely acid; clear wavy boundary.
Bt—13 to 21 inches; yellowish brown (10YR 5/8) loam; weak medium subangular blocky structure; friable; slightly sticky, slightly plastic; few coarse roots; few faint clay films on ped faces; few fine prominent red (2.5YR 4/6) irregularly shaped soft masses of iron accumulation throughout; many medium and coarse dark grayish

brown (10YR 4/2) iron depletions throughout; black (10YR 2/1) organic matter accumulations 1 to 5 centimeters thick in root channels throughout 10 percent of the horizon; few fine mica flakes throughout; extremely acid; clear wavy boundary.

Cg—21 to 36 inches; pale red (2.5YR 6/2) very fine sandy loam; massive; friable; common medium and coarse distinct dark yellowish brown (10YR 4/6) irregularly shaped soft masses of iron accumulation lining pores; 5 percent, by volume, gravel; very strongly acid; abrupt wavy boundary.

2C—36 to 80 inches; yellowish brown (10YR 5/6), red (2.5YR 5/8), and strong brown (7.5YR 5/6) very gravelly loamy sand; massive; loose; 39 percent, by volume, gravel, 5 percent cobbles, and 15 percent stones; very strongly acid.

Range in Characteristics

Solum thickness: 20 to 40 inches

Depth to bedrock: More than 60 inches

Content of mica flakes: Few or common

Content and size of rock fragments: 5 to 35 percent in horizons above the 2C horizon and 35 to 80 percent in the 2C horizon; dominantly well rounded gravel, cobbles, or stones

Soil reaction: Ultra acid to extremely acid in the O and A horizons and extremely acid to strongly acid in the B and C horizons

O horizon:

Texture—highly decomposed to moderately decomposed organic litter and root mat

Thickness—typically 4 to 10 inches but can vary depending on extent and type of vegetative cover

A horizon (it it occurs):

Color—hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 to 3

Thickness—3 to 10 inches

Texture (fine-earth fraction)—loam, fine sandy loam, or sandy loam

Btg horizon:

Color—hue of 7.5YR to 2.5Y, value of 2 to 5, and chroma of 1 or 2

Texture (fine-earth fraction)—sandy loam, loam, sandy clay loam, or clay loam

Redoximorphic features—iron or clay depletions in shades of brown, yellow, olive, or gray; iron accumulations in shades of red, brown, yellow, or olive

Bt horizon:

Color—hue of 7.5YR to 10YR, value of 4 to 6, and chroma of 4 to 8

Texture (fine-earth fraction)—sandy loam, loam, sandy clay loam, or clay loam

Cg horizon:

Color—hue of 10YR or 2.5Y, value of 2 to 6, and chroma of 1 or 2

Texture (fine-earth fraction)—sandy loam, fine sandy loam, very fine sandy loam, or loam colluvium/alluvium

Redoximorphic features—iron or clay depletions in shades of brown, yellow, olive, or gray; iron accumulations in shades of red, brown, yellow, or olive

C horizon (if it occurs):

Color—hue of 5YR to 10YR, value of 4 or 5, and chroma of 3 to 6

Texture (fine-earth fraction)—sandy loam, fine sandy loam, very fine sandy loam, or loam

2C horizon:

Color—hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 6 or 8; in some pedons horizon may not have a dominant matrix color and be multicolored in shades of yellow, brown, red, or gray

Texture (fine-earth fraction)—loamy sand, sandy loam, or fine sandy loam colluvium/alluvium

Anakeesta Series

Depth class: Deep
Drainage class: Well drained
Depth to seasonal high water table: More than 6.0 feet
Permeability: Moderately rapid
Parent material: Residuum affected by soil creep in the upper solum, weathered from low-grade metasedimentary rock, primarily sulfidic slate
Landscape: High mountains, around Cheoah Bald to the east near Swain County and Joanna Bald in the southern part of the survey area near Cherokee County
Landform: Ridges and mountain slopes
Landform position: Summits and side slopes
Slope range: 15 to 95 percent
Taxonomic classification: Loamy-skeletal, isotic, frigid Humic Dystrudepts

Typical Pedon

Anakeesta channery loam in an area of Luftee-Anakeesta complex, windswept, 50 to 95 percent slopes, very rocky; in Sevier County, Tennessee (Great Smoky Mountains National Park); about 13.0 miles north of Bryson City and just upslope from the last tunnel going to Newfound Gap; USGS Clingmans Dome topographic quadrangle; lat. 35 degrees 36 minutes 57 seconds N. and long. 83 degrees 25 seconds 13 minutes W. (A representative map unit for Graham County is on USGS Hewitt topographic quadrangle; lat. 35 degrees 19 minutes 1 second N. and long. 83 degrees 41 minutes 2 seconds W.)

Oe—0 to 1 inch; moderately decomposed organic litter and root mat; abrupt smooth boundary.
A1—1 to 8 inches; very dark grayish brown (10YR 3/2) channery loam; moderate fine to coarse granular structure; very friable; many medium to coarse and common fine and very fine roots; 20 percent, by volume, slate channers and 5 percent metasandstone channers; extremely acid; clear wavy boundary.
A2—8 to 14 inches; dark brown (10YR 3/3) very channery loam; weak medium and coarse subangular blocky structure; friable; few fine and medium roots; 30 percent, by volume, slate channers, 10 percent metasandstone channers, and 10 percent quartz gravel; very strongly acid; clear wavy boundary.
Bw—14 to 45 inches; dark yellowish brown (10YR 4/4) extremely channery loam; weak medium and coarse subangular blocky structure; friable; 45 percent, by volume, slate channers, 10 percent metasandstone channers, and 10 percent quartz gravel; strongly acid; clear smooth boundary.
R—45 to 80 inches; unweathered, hard, fractured Anakeesta slate.

Range in Characteristics

Solum thickness: 40 to 60 inches
Depth to bedrock: 40 to 60 inches
Content of mica flakes: None or few
Content and size of rock fragments: 15 to 45 percent, by volume, in the A and B horizons and more than 40 percent in the C horizon; dominantly channers and flagstones
Soil reaction: Extremely acid to strongly acid throughout the profile

A1 horizon:
Color—hue of 10YR, value of 2 or 3, and chroma of 1 to 3

Combined thickness of A horizons—7 to 14 inches
Texture (fine-earth fraction)—loam or silt loam

A2 horizon:
Color—hue of 10YR, value of 2 or 3, and chroma of 1 to 3
Texture (fine-earth fraction)—loam or silt loam

BA horizon (if it occurs):
Color—hue of 10YR, value of 3, and chroma of 2 or 3
Texture (fine-earth fraction)—loam or silt loam

Bw horizon:
Color—hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 2 to 6
Texture (fine-earth fraction)—loam or silt loam

R layer:
Type of bedrock—unweathered, hard, low-grade metasedimentary rock with very high or extremely high excavation difficulty

Braddock Series

Depth class: Very deep
Drainage class: Well drained
Depth to seasonal high water table: More than 6.0 feet
Permeability: Moderate in the surface horizon, slow or moderately slow in the subsoil, and moderate or moderately rapid in the underlying material
Parent material: Old alluvium and colluvium derived from low-grade metasedimentary rock
Landscape: Valleys of low mountains and intermountain hills, dominantly along Tallulah, Sweetwater, and Long Creeks in the central part of the county
Landform: High stream terraces
Landform position: Benches
Slope range: 2 to 30 percent
Taxonomic classification: Fine, mixed, semiactive, mesic Typic Hapludults

Typical Pedon

Braddock clay loam, 2 to 8 percent slopes, moderately eroded; in Jackson County, North Carolina; about 1.2 miles from the Swain-Jackson County line, from Cherokee south on U.S. Highway 441 to its intersection with Secondary Road 1406, about 350 feet northwest of the intersection of U.S. Highway 441 and Secondary Road 1406, in a grassed field; USGS Whittier topographic quadrangle; lat. 35 degrees 26 minutes 54 seconds N. and long. 83 degrees 18 minutes 31 seconds W. (A representative map unit for Graham County is on USGS Robbinsville topographic quadrangle; lat. 35 degrees 20 minutes 8 seconds N. and long. 83 degrees 48 minutes 33 seconds W.)

Ap—0 to 8 inches; reddish brown (5YR 4/4) clay loam; weak medium granular structure; friable; many fine roots; few fine flakes of mica; 5 percent, by volume, gravel; neutral; clear smooth boundary.
Bt1—8 to 18 inches; red (2.5YR 4/8) clay; moderate fine and medium subangular blocky structure; firm; sticky, slightly plastic; 5 percent gravel; common discontinuous clay films on faces of peds; few fine flakes of mica; strongly acid; gradual wavy boundary.
Bt2—18 to 36 inches; red (2.5YR 4/8) clay; few fine distinct strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm; sticky, slightly plastic; 9 percent gravel and 1 percent cobbles; common discontinuous clay films on faces of peds; few fine flakes of mica; strongly acid; gradual wavy boundary.

Bt3—36 to 52 inches; red (2.5YR 5/8) clay; common medium distinct strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm; sticky, slightly plastic; 9 percent gravel and 1 percent cobbles; common discontinuous clay films on faces of peds; few manganese stains; few fine flakes of mica; strongly acid; gradual wavy boundary.

BC—52 to 80 inches; mottled red (2.5YR 5/8), yellowish red (5YR 5/8), and strong brown (7.5YR 5/8) clay loam; weak medium subangular blocky structure; friable; slightly sticky, slightly plastic; 10 percent gravel and 2 percent cobbles; common manganese stains; common fine flakes of mica; strongly acid.

Range in Characteristics

Solum thickness: 40 to more than 60 inches
Depth to bedrock: More than 60 inches
Content of mica flakes: Few or common
Content and size of rock fragments: Less than 15 percent, by volume, in the Ap, Bt, BC, and C horizons and less than 60 percent in the 2C horizon; dominantly well rounded gravel or cobbles
Soil reaction: Extremely acid to strongly acid throughout the profile, except where surface layers have been limed

Ap horizon:
Color—hue of 5YR to 10YR, value of 2 to 5, and chroma of 2 to 6; where value is 3 or less, the A horizon is less than 7 inches thick
Texture (fine-earth fraction)—clay loam, loam, sandy loam, fine sandy loam, sandy clay loam, or silty clay loam

BA horizon (if it occurs):
Color—hue of 2.5YR to 7.5YR, value of 4 or 5, and chroma of 4 to 8
Texture (fine-earth fraction)—clay loam, sandy clay loam, or clay

Bt horizon:
Color—hue of 10R or 2.5YR, value of 3 to 5, and chroma of 6 to 8; some pedons have subhorizons with hue of 5YR
Texture (fine-earth fraction)—clay, clay loam, or sandy clay

BC horizon:
Color—hue of 10R or 2.5YR, value of 3 to 5, and chroma of 6 or 8; some pedons have subhorizons with hue of 5YR
Texture (fine-earth fraction)—sandy clay loam, clay loam, sandy clay, or clay

2C or C horizon (if it occurs):
Color—hue of 2.5YR to 7.5YR, value of 4 to 8, and chroma of 3 to 6
Texture (fine-earth fraction)—sandy loam, fine sandy loam, loam, sandy clay loam, or clay loam; horizon has sandy, gravelly, and cobbly substrata in some pedons

Brasstown Series

Depth class: Deep
Drainage class: Well drained
Depth to seasonal high water table: More than 6.0 feet
Permeability: Moderate
Parent material: Residuum affected by soil creep in the upper solum, weathered from low-grade metasedimentary rock, such as metagraywacke and metasandstone
Landscape: Low and intermediate mountains and intermountain hills, dominantly in the central and northern parts of the county

Landform: Ridges and south- to west-facing mountain slopes
Landform position: Summits and side slopes
Slope range: 8 to 50 percent
Taxonomic classification: Fine-loamy, mixed, subactive, mesic Typic Hapludults

Typical Pedon

Brasstown channery fine sandy loam in an area of Junaluska-Brasstown complex, 15 to 30 percent slopes (fig. 41); in Cherokee County, North Carolina; about 6 miles west of Murphy and 7.50 miles west on U.S. Highway 64 to Secondary Road 1301, west on Secondary Road 1301 to Secondary Road 1302, northwest on Secondary Road 1302 to Secondary Road 1303, northeast on Secondary Road 1303 to U.S. Forest Service Road 307, about 0.5 mile west of U.S. Forest Service Road 6068 on U.S. Forest Service Road 307, in woods; USGS Persimmon Creek topographic quadrangle; lat. 35 degrees 5 minutes 33 seconds N. and long. 84 degrees 8 minutes 7 seconds W. (A representative map unit for Graham County is on USGS Santeetlah topographic quadrangle; lat. 35 degrees 19 minutes 50 seconds N. and long. 83 degrees 52 minutes 18 seconds W.)

Oe—0 to 1 inch; moderately decomposed organic litter and root mat; abrupt smooth boundary.

A—1 to 6 inches; dark brown (7.5YR 4/4) channery fine sandy loam, reddish yellow (7.5YR 6/6) dry; moderate fine granular structure; very friable; common fine and medium roots; few fine flakes of mica; 25 percent, by volume, metasandstone and phyllite channers; very strongly acid; clear wavy boundary.

BA—6 to 10 inches; yellowish red (5YR 5/6) channery sandy clay loam; weak medium subangular blocky structure; very friable; common fine and medium roots; common fine flakes of mica; 20 percent, by volume, metasandstone and phyllite channers; very strongly acid; abrupt wavy boundary.

Bt—10 to 29 inches; red (2.5YR 4/8) channery sandy clay loam; moderate medium subangular blocky structure; friable; few fine and medium roots; common fine flakes of mica; 25 percent, by volume, metasandstone and phyllite channers; strongly acid; gradual wavy boundary.

BC—29 to 37 inches; red (2.5YR 4/6) channery fine sandy loam; weak medium subangular blocky structure; very friable; common fine flakes of mica; 25 percent, by volume, phyllite channers; strongly acid; gradual wavy boundary.

C—37 to 46 inches; variegated channery very fine sandy loam saprolite in shades of red and brown; massive; very friable; common fine flakes of mica; 30 percent, by volume, phyllite channers; strongly acid; gradual wavy boundary.

Cr—46 to 80 inches; weathered, moderately cemented interbedded metasandstone and phyllite; high excavation difficulty; few fine and medium roots in cracks that are spaced more than 4 inches apart.

Range in Characteristics

Solum thickness: 26 to 59 inches
Depth to bedrock: 40 to 60 inches to weathered bedrock
Content of mica flakes: Few or common
Content and size of rock fragments: Less than 30 percent, by volume; dominantly channers but ranging to flagstones in the C horizon
Soil reaction: Extremely acid to moderately acid throughout the profile, except where surface layers have been limed

A or Ap horizon:
Color—hue of 10YR to 5YR, value of 2 to 5, and chroma of 2 to 8; where value is 3 or less, the A horizon is less than 7 inches thick
Texture (fine-earth fraction)—loam, fine sandy loam, or silt loam

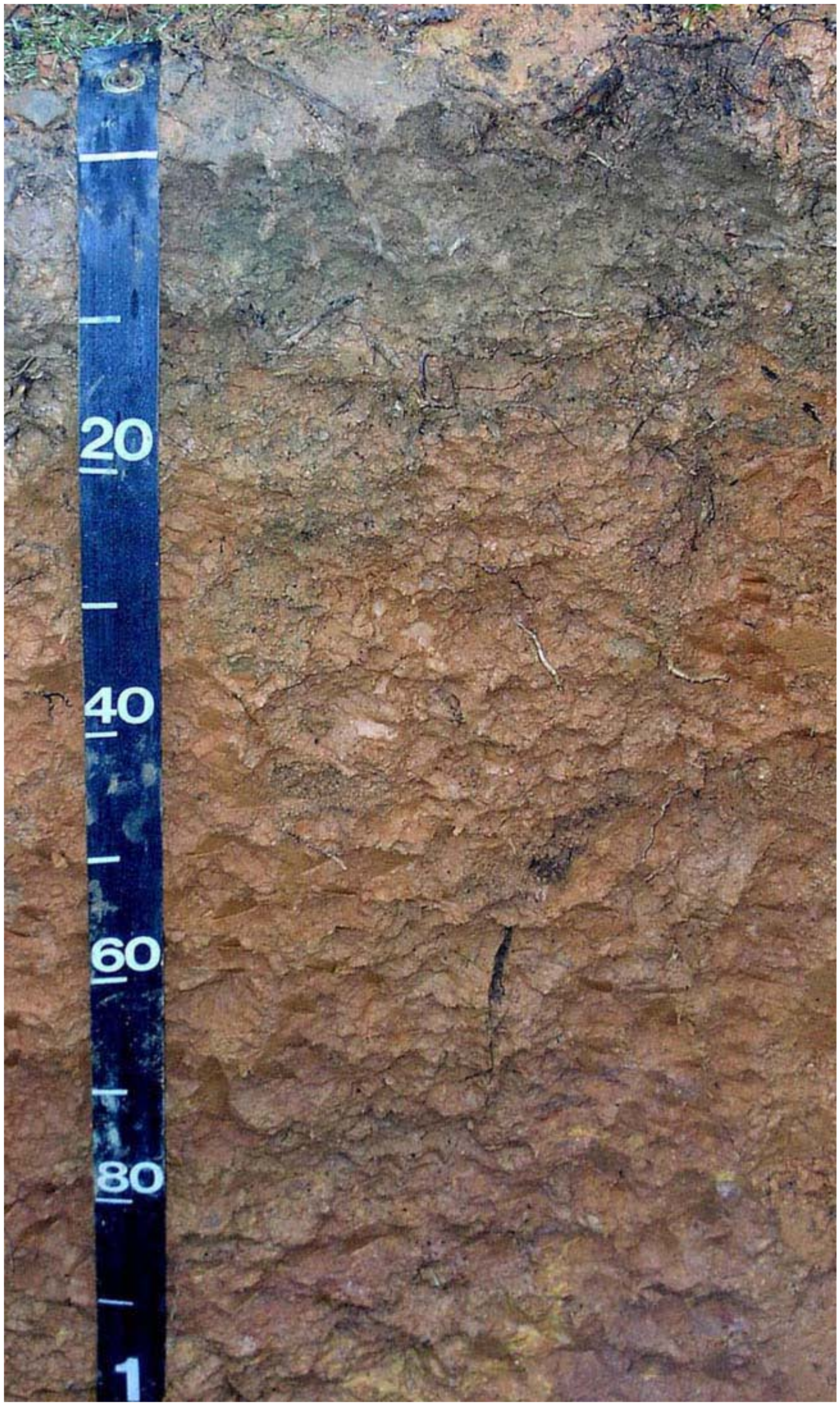


Figure 41.—Typical profile of Brasstown channery fine sandy loam. Brasstown soils are deep to weathered bedrock. They occur on intermountain hills and low mountains in the central and northern parts of the county. (Scale is in centimeters.)

BA horizon:

Color—hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8

Texture (fine-earth fraction)—loam, fine sandy loam, very fine sandy loam, sandy clay loam, or silt loam

Bt horizon:
Color—hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8; at least part of the horizon has hue of 2.5YR or 5YR
Texture (fine-earth fraction)—clay loam, loam, very fine sandy loam, sandy clay loam, silt loam, or silty clay loam

BC horizon:
Color—hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8
Texture (fine-earth fraction)—loam, fine sandy loam, very fine sandy loam, sandy clay loam, or silt loam

C horizon (if it occurs):
Color—horizon has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8 or is variegated in shades of these colors
Texture (fine-earth fraction)—fine sandy loam, very fine sandy loam, sandy loam, loam, or silt loam saprolite; thin parallel layers of saprolite and Bt horizon material may occur along fracture planes

Cr layer:
Type of bedrock—weathered, weakly cemented to strongly cemented, low-grade metasedimentary rock with moderate or high excavation difficulty
Other characteristics—few fine and medium roots in cracks that are spaced more than 4 inches apart

Breakneck Series

Depth class: Moderately deep
Drainage class: Well drained
Depth to seasonal high water table: More than 6.0 feet
Permeability: Moderate
Parent material: Residuum affected by soil creep in the upper solum, weathered from low-grade metasedimentary rock, such as metagraywacke
Landscape: High mountains in the western part of the county
Landform: Ridges and mountain slopes
Landform position: Summits and side slopes
Slope range: 8 to 95 percent
Taxonomic classification: Fine-loamy, isotic, frigid Humic Dystrudepts

Typical Pedon

Breakneck channery loam in an area of Breakneck-Pullback complex, 15 to 30 percent slopes, windswept, very rocky (fig. 42); in Sevier County, Tennessee (Great Smoky Mountains National Park); about 9.5 miles northwest of Bryson City near the summit of Clingmans Dome, between the observation tower and the Appalachian Trail; USGS Clingmans Dome topographic quadrangle; lat. 35 degrees 33 minutes 46 seconds N. and long. 83 degrees 29 minutes 58 seconds W. (A representative map unit for Graham County is on USGS Big Junction topographic quadrangle; lat. 35 degrees 19 minutes 17 seconds N. and long. 83 degrees 59 minutes 38 seconds W.)

Oe—0 to 3 inches; moderately decomposed organic litter and root mat; abrupt smooth boundary.
A—3 to 12 inches; black (10YR 2/1) channery loam; moderate fine and medium granular structure; friable; common fine, coarse, and very coarse roots; 19 percent, by volume, metasandstone channers; very strongly acid; abrupt wavy boundary.

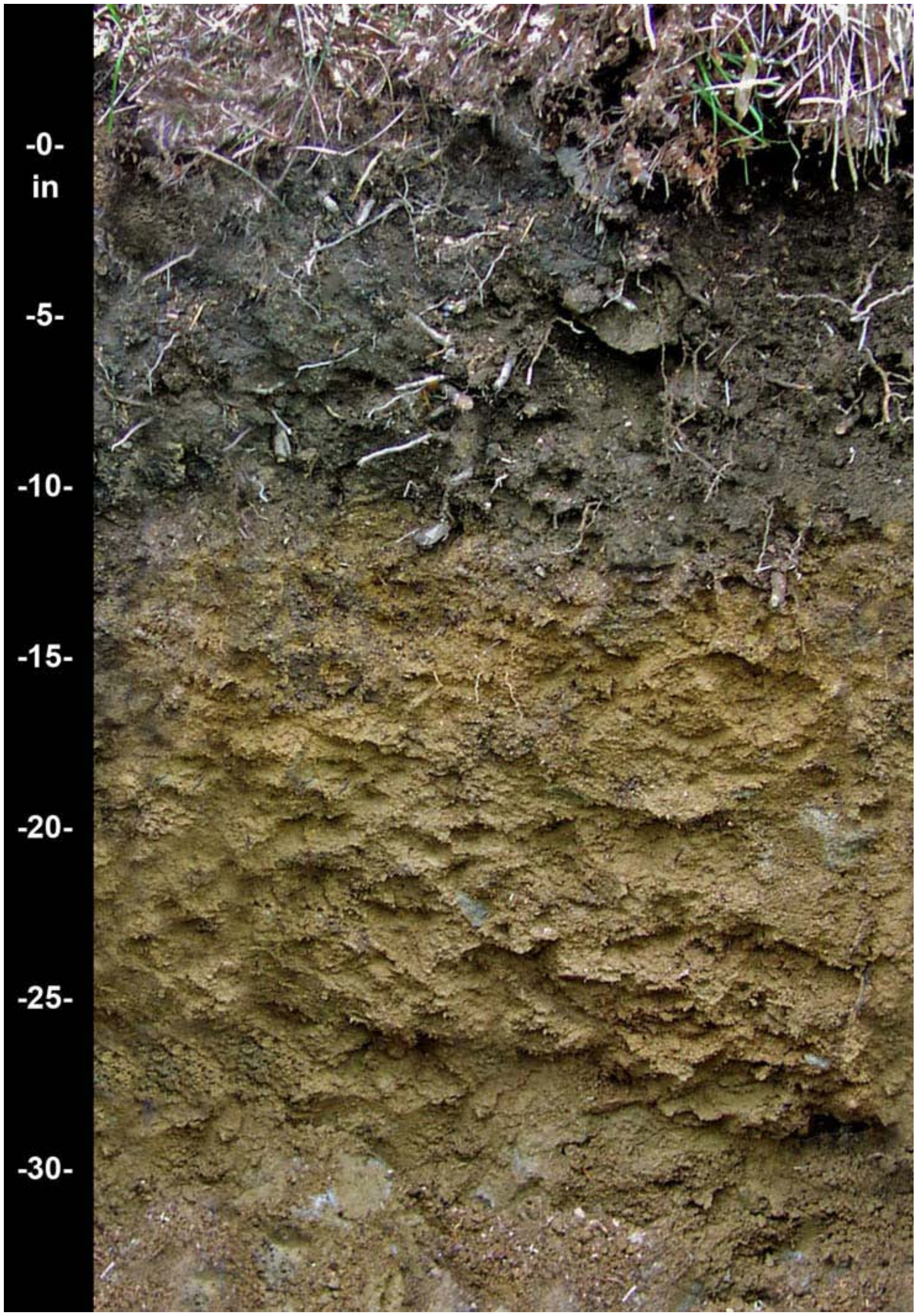


Figure 42.—Typical profile of Breakneck channery loam. Breakneck soils are moderately deep to unweathered, hard bedrock and have thick, dark surface layers. They occur on high mountains in the western and southern parts of the county. (Scale is in inches.)

Bw—12 to 28 inches; dark yellowish brown (10YR 4/4) channery loam; weak coarse subangular blocky structure; friable; few fine roots; 34 percent, by volume, metasandstone channers; very strongly acid; abrupt wavy boundary.

R—28 to 80 inches; unweathered, hard Thunderhead metasandstone bedrock.

Range in Characteristics

Solum thickness: 20 to 40 inches
Depth to bedrock: 20 to 40 inches to weathered bedrock
Content of mica flakes: None or few
Content and size of rock fragments: Less than 30 percent, by volume; dominantly channers or flagstones but including gravel, cobbles, and stones
Soil reaction: Extremely acid to strongly acid throughout the profile

A horizon:
Color—hue of 10YR, value of 2 or 3, and chroma of 1 to 3
Thickness—8 to 18 inches
Texture (fine-earth fraction)—clay loam or loam

Bw horizon:
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 8
Texture (fine-earth fraction)—loam or sandy loam

BC horizon (if it occurs):
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 8
Texture (fine-earth fraction)—loam or sandy loam

C horizon (if it occurs):
Color—horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 8 or may be mixed or mottled in shades of these colors
Texture (fine-earth fraction)—fine sandy loam, sandy loam, loamy fine sand, or loamy sand saprolite

Cr layer (if it occurs):
Type of bedrock—weathered, weakly cemented to strongly cemented, low-grade metasedimentary rock with moderate or high excavation difficulty
Other characteristics—few fine and medium roots in cracks that are spaced more than 4 inches apart

R layer:
Type of bedrock—unweathered, hard, metasandstone rock with very high to extremely high excavation difficulty

Cataska Series

Depth class: Shallow
Drainage class: Excessively drained
Depth to seasonal high water table: More than 6.0 feet
Permeability: Moderately rapid
Parent material: Residuum affected by soil creep in the upper solum, weathered from low-grade metasedimentary rock, such as slate
Landscape: Low and intermediate mountains in the northwestern, north-central, and southeastern parts of the county
Landform: Ridges and south- to west-facing mountain slopes
Landform position: Summits and side slopes
Slope range: 15 to 95 percent
Taxonomic classification: Loamy-skeletal, mixed, semiactive, mesic, shallow Typic Dystrudepts

Typical Pedon

Cataska very channery loam in an area of Sylco-Cataska complex, 30 to 50 percent slopes, very rocky; in Cherokee County, North Carolina; about 16 miles northwest of Murphy and 150 feet east of Secondary Road 1326 at Unicoi Gap; USGS Farner topographic quadrangle; lat. 35 degrees 13 minutes 27 seconds N. and long. 84 degrees 17 minutes 23 seconds W. (A representative map unit for Graham County is on USGS Hewitt topographic quadrangle; lat. 35 degrees 21 minutes 35 seconds N. and long. 83 degrees 38 minutes 56 seconds W.)

Oe—0 to 1 inch; moderately decomposed organic litter and root mat; abrupt smooth boundary.

A—1 to 5 inches; dark brown (10YR 3/3) very channery loam; weak fine to medium granular structure; very friable; many medium and coarse roots; 30 percent, by volume, channers and 8 percent flagstones; very strongly acid; clear smooth boundary.

Bw—5 to 18 inches; dark yellowish brown (10YR 4/4) very channery loam; weak fine to medium subangular blocky structure; very friable; common medium and coarse roots; 25 percent, by volume, channers and 15 percent flagstones; strongly acid; clear irregular boundary.

Cr—18 to 22 inches; weathered, moderately cemented slate; high excavation difficulty; few thin seams of dark yellowish brown (10YR 3/4) loam in cracks; few medium roots in cracks that are spaced more than 4 inches apart; strongly acid; gradual irregular boundary.

R—22 to 80 inches; unweathered, hard slate bedrock.

Range in Characteristics

Solum thickness: 12 to 20 inches; thickness can be difficult to determine as horizons below the A horizon have many fragments and can be interpreted as B or C horizons

Depth to bedrock: 10 to 20 inches to weathered bedrock; 20 to 48 inches or more to unweathered bedrock

Content of mica flakes: None or few

Content and size of rock fragments: 15 to 45 percent, by volume, in the A horizon and 35 to 80 percent in Bw and C horizons; dominantly channers and flagstones

Soil reaction: Extremely acid to strongly acid throughout the profile

A horizon:

Color—hue of 7.5YR or 10YR, value of 2 to 5, and chroma of 2 to 6; where value is 3 or less, horizon is less than 7 inches thick

Texture (fine-earth fraction)—silt loam or loam

Bw horizon:

Color—dominantly hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8; hue of 2.5Y, value of 4 or 5, and chroma of 4 to 6 in some pedons

Texture (fine-earth fraction)—silt loam or loam

C horizon (if it occurs):

Color—dominantly hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8; hue of 2.5Y, value of 4 or 5, and chroma of 4 to 6 in some pedons

Texture (fine-earth fraction)—silt loam or loam saprolite

Cr layer:

Type of bedrock—weathered, weakly cemented to strongly cemented, low-grade metasedimentary rock with moderate or high excavation difficulty

Other characteristics—few fine and medium roots in cracks that are spaced more than 4 inches apart

R layer:

Type of bedrock—unweathered, hard, low-grade metasedimentary rock with very high or extremely high excavation difficulty

Cheoah Series

Depth class: Deep
Drainage class: Well drained
Depth to seasonal high water table: More than 6.0 feet
Permeability: Moderately rapid
Parent material: Residuum affected by soil creep in the upper solum, weathered from low-grade metasedimentary rock, such as metagraywacke and metasandstone
Landscape: Intermediate mountains throughout the county
Landform: North- to east-facing ridges and mountain slopes and those slopes shaded by the higher mountains
Landform position: Summits and side slopes
Slope range: 15 to 95 percent
Taxonomic classification: Fine-loamy, isotic, mesic Typic Humudepts

Typical Pedon

Cheoah channery loam, 30 to 50 percent slopes, stony; in Graham County; about 4.50 miles northwest of Robbinsville, 0.6 mile east on Secondary Road 1144 from U.S. Highway 129, about 1.70 miles northeast on Secondary Road 1252, about 1.30 miles northwest on U.S. Forest Service Road 2627, about 274 feet along an old logging road; USGS Fontana Dam topographic quadrangle; lat. 35 degrees 23 minutes 6 seconds N. and long. 83 degrees 49 minutes 45 seconds W.

Oe—0 to 2 inches; moderately decomposed organic litter and root mat; abrupt smooth boundary.
A1—2 to 8 inches; very dark grayish brown (10YR 3/2) channery loam; moderate fine and medium granular structure; very friable; many fine, common medium, and few coarse roots; few fine flakes of mica; 20 percent, by volume, metasandstone and phyllite channers; very strongly acid; clear wavy boundary.
A2—8 to 14 inches; dark brown (10YR 3/3) channery loam; moderate fine and medium granular structure; very friable; common fine and medium roots; few fine flakes of mica; 20 percent, by volume, metasandstone and phyllite channers; strongly acid; clear smooth boundary.
Bw—14 to 40 inches; yellowish brown (10YR 5/8) loam; weak medium subangular blocky structure; very friable; few fine and medium roots; few fine flakes of mica; strongly acid; gradual wavy boundary.
C—40 to 55 inches; yellowish brown (10YR 5/8) channery fine sandy loam; massive; very friable; few fine flakes of mica; 30 percent, by volume, phyllite and metasandstone channers; strongly acid; gradual wavy boundary. (0 to 12 inches thick)
Cr—55 to 80 inches; weathered, moderately cemented interbedded metasandstone and phyllite; high excavation difficulty; black (10YR 2/1) manganese coatings along fractures; few seams of strong brown (10YR 5/8) channery loam along fractures; few fine and medium roots in cracks that are spaced more than 4 inches apart; strongly acid.

Range in Characteristics

Solum thickness: 30 to 59 inches
Depth to bedrock: 40 to 60 inches to weathered bedrock
Content of mica flakes: None or few
Content and size of rock fragments: Less than 30 percent, by volume; dominantly channers or flagstones but including gravel, cobbles, and stones
Soil reaction: Extremely acid to moderately acid throughout the profile

A horizon:
Color—hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 to 3
Combined thickness of the A horizons—10 to 20 inches
Texture (fine-earth fraction)—fine sandy loam, loam, or silt loam

AB or BA horizon (if it occurs):
Color—hue of 7.5YR or 10YR and value and chroma of 3 or 4
Texture (fine-earth fraction)—loam, fine sandy loam, or silt loam

Bw horizon:
Color—hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 8
Texture (fine-earth fraction)—loam, fine sandy loam, or silt loam

BC horizon (if it occurs):
Color—hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 8
Texture (fine-earth fraction)—loam, fine sandy loam, or silt loam

C horizon:
Color—hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 8
Texture (fine-earth fraction)—loam, fine sandy loam, or silt loam saprolite

Cr layer:
Type of bedrock—weathered, weakly cemented to strongly cemented, low-grade metasedimentary rock with moderate or high excavation difficulty
Other characteristics—few fine and medium roots in cracks that are spaced more than 4 inches apart

Chiltoskie Series

Depth class: Very deep
Drainage class: Well drained
Depth to seasonal high water table: More than 6.0 feet
Permeability: Moderately rapid
Parent material: Colluvium derived from low-grade metasedimentary rock
Landscape: High mountains in the western and eastern parts of the county
Landform: Coves and drainageways
Landform position: Head slopes, footslopes, and toeslopes
Slope range: 15 to 50 percent
Taxonomic classification: Fine-loamy, isotic, frigid Typic Humudepts

Typical Pedon

Chiltoskie loam in an area of Chiltoskie-Heintooga complex, 8 to 15 percent slopes, very stony; in Swain County, North Carolina (Great Smoky Mountains National Park); at Balsam picnic area, on Balsam Mountain Road, 350 feet south of the parking area; USGS Bunches Bald topographic quadrangle; lat. 35 degrees 34 minutes 17 seconds N. and long. 84 degrees 1 minute 18 seconds W. (A representative map unit for Graham County is on USGS Big Junction topographic quadrangle; lat. 35 degrees 18 minutes 16 seconds N. and long. 84 degrees 1 minute 19 seconds W.)

Oe—0 to 1 inch; moderately decomposed organic litter and root mat; abrupt smooth boundary.
A—1 to 8 inches; very dark brown (10YR 2/2) loam; moderate medium to very coarse granular structure; very friable; many fine to coarse and common very coarse roots throughout; 3 percent, by volume, metasandstone channers; few fine flakes of mica; extremely acid; clear wavy boundary.
Bw1—8 to 14 inches; dark yellowish brown (10YR 4/4) channery loam; moderate fine to coarse subangular blocky structure; friable; few medium roots throughout;

16 percent, by volume, metasandstone channers; few fine flakes of mica; very strongly acid; clear smooth boundary.

Bw2—14 to 26 inches; dark yellowish brown (10YR 4/6) loam; moderate fine to coarse subangular blocky structure; friable; 6 percent, by volume, metasandstone channers; few fine flakes of mica; very strongly acid; clear smooth boundary.

Bw3—26 to 41 inches; dark yellowish brown (10YR 4/6) loam; moderate fine and coarse subangular blocky structure; friable; 2 percent, by volume, metasandstone channers; few fine flakes of mica; very strongly acid; clear smooth boundary.

BC—41 to 80 inches; dark yellowish brown (10YR 4/6) very channery sandy loam; weak medium and coarse subangular blocky structure; friable; 38 percent, by volume, metasandstone channers; few fine flakes of mica; very strongly acid.

Range in Characteristics

Solum thickness: 30 to more than 60 inches
Depth to bedrock: More than 60 inches
Content of mica flakes: Few or common
Content and size of rock fragments: Less than 35 percent, by volume, to a depth of 40 inches and less than 60 percent below a depth of 40 inches; ranging from channers to boulders; size and number generally increase as depth increases
Soil reaction: Extremely acid to strongly acid throughout the profile

A horizon:
Color—hue of 7.5YR to 10YR, value of 2 or 3, and chroma of 1 to 3
Combined thickness of the A horizons—7 to 10 inches
Texture (fine-earth fraction)—fine sandy loam, sandy loam, or loam

Bw horizon:
Color—hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 8
Texture (fine-earth fraction)—fine sandy loam, sandy loam, or loam

BC horizon:
Color—hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 8
Texture (fine-earth fraction)—fine sandy loam, sandy loam, or loam

C horizon (if it occurs):
Color—horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 8 or is variegated in shades of these colors
Texture (fine-earth fraction)—loamy sand, sandy loam, fine sandy loam, or loam colluvium

Cullowhee Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Depth to seasonal high water table: 1.0 to 2.5 feet from December through May and 2.0 to 3.5 feet from June through November
Permeability: Moderately rapid in the surface horizon and upper portion of the underlying material and rapid in the lower portion
Parent material: Recent alluvium that is coarse-loamy in the upper part and sandy or sandy-skeletal in the lower part; derived from materials weathered from low-grade metasedimentary rock
Landscape: Valleys of low and intermediate mountains throughout the county
Landform: Flood plains
Landform position: Planar to slightly concave bottomland slopes
Slope range: 0 to 3 percent

Figure 43.—Typical profile of Cullowhee fine sandy loam. Cullowhee soils are very deep and have thick, dark surface layers. They formed in stream-deposited materials consisting of coarse-loamy material over strata of cobbles, gravel, and sand. They occur on flood plains along the larger streams and rivers throughout the county. (Scale is in inches.)

Taxonomic classification: Coarse-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Fluvaquentic Humudepts

Typical Pedon

Cullowhee fine sandy loam in an area of Cullowhee-Ela complex, 0 to 3 percent slopes, occasionally flooded (fig. 43); in Graham County; about 8 miles northeast of Robbinsville, 500 feet northeast of N.C. Highway 28 and Secondary Road 1241 on Secondary Road 1241, about 400 feet east in a field; USGS Tuskeegee topographic quadrangle; lat. 35 degrees 24 minutes 31 seconds N. and long. 83 degrees 43 minutes 1 second W.

Ap—0 to 12 inches; dark brown (10YR 3/3) fine sandy loam; moderate fine granular structure; very friable; many fine and common medium roots; common fine flakes of mica; strongly acid; clear smooth boundary.

Bw—12 to 18 inches; yellowish brown (10YR 5/4) fine sandy loam; weak fine subangular blocky structure; friable; common fine and few medium roots; common fine flakes of mica; strongly acid; gradual wavy boundary.

Cg—18 to 33 inches; dark grayish brown (10YR 4/2) and yellowish brown (10YR 5/4) loamy fine sand; massive; very friable; few fine and medium roots; common fine flakes of mica; strongly acid; gradual wavy boundary.

2Cg—33 to 80 inches; dark grayish brown (10YR 4/2) very cobbly fine sand; single grain; loose; common fine flakes of mica; 15 percent, by volume, gravel and 35 percent rounded cobbles; strongly acid.

Range in Characteristics

Solum thickness: 12 to 35 inches
Depth to contrasting material: 20 to 40 inches to deposits of cobbles and gravel that are stratified with sandy or loamy material
Depth to bedrock: More than 60 inches
Content of mica flakes: Few or common
Content and size of rock fragments: Less than 35 percent, by volume, in the A and B horizons and more than 35 percent in the C horizon; dominantly well rounded gravel or cobbles but including stones
Soil reaction: Very strongly acid to slightly acid throughout the profile, except where surface layers have been limed

Ap or A horizon:
Color—hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 to 3
Thickness of A horizon—10 to 20 inches
Texture (fine-earth fraction)—fine sandy loam, sandy loam, or loam

AC horizon (if it occurs):
Color—10YR or 2.5Y, value of 2 or 3, and chroma of 1 to 4
Texture (fine-earth fraction)—loamy sand, loamy fine sand, sand, or coarse sand
Redoximorphic features—iron depletions in shades of brown, yellow, olive, or gray

Bw horizon:
Color—hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 3 to 6
Texture (fine-earth fraction)—loam, fine sandy loam, or sandy loam

Bg horizon (if it occurs):
Color—hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2
Texture (fine-earth fraction)—loam, fine sandy loam, or sandy loam
Redoximorphic features—iron or clay depletions in shades of brown, yellow, olive, or gray

C horizon (if it occurs):
Color—hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 3 to 6
Texture (fine-earth fraction)—typically sand, coarse sand, loamy sand, fine sand, or loamy fine sand; range includes sandy loam, fine sandy loam, and loam alluvium

Cg horizon:
Color—hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 to 2
Texture (fine-earth fraction)—typically sand, coarse sand, loamy sand, fine sand, or loamy fine sand; range includes sandy loam, fine sandy loam, and loam alluvium
Redoximorphic features—iron or clay depletions in shades of brown, yellow, olive, or gray

2Cg horizon:
Color—hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 to 2
Texture (fine-earth fraction)—typically sand, coarse sand, loamy sand, fine sand, or loamy fine sand; range includes sandy loam, fine sandy loam, and loam alluvium
Other characteristics—horizon is at or below the free water table and is continually saturated year-round

Dellwood Series

Depth class: Very deep
Drainage class: Moderately well drained
Depth to seasonal high water table: 2.0 to 4.0 feet from December through May and 2.5 to 4.5 feet from June through November
Permeability: Moderately rapid in the A horizon and rapid or very rapid in the C horizon
Parent material: Recent alluvium that is sandy-skeletal, derived from materials weathered from low-grade metasedimentary rock
Landscape: Valleys of low and intermediate mountains throughout the county
Landform: Flood plains dominantly at the upper end of mountain valleys
Landform position: Planar to slightly convex bottomland slopes
Slope range: 0 to 5 percent
Taxonomic classification: Sandy-skeletal, mixed, mesic Oxyaquic Humudepts

Typical Pedon

Dellwood gravelly fine sandy loam in an area of Dellwood fine sandy loam, 0 to 5 percent slopes, occasionally flooded (fig. 44); in Cherokee County, North Carolina; about 15 miles northwest of Murphy, 0.8 mile northeast of Secondary Road 1325 on Secondary Road 1327, about 0.67 mile north on U.S. Forest Service Road 50, about 150 feet east of U.S. Forest Service Road 50, in woods; USGS Unaka topographic quadrangle; lat. 35 degrees 14 minutes 16 seconds N. and long. 84 degrees 13 minutes 38 seconds W. (A representative map unit for Graham County is on USGS Santeetlah topographic quadrangle; lat. 35 degrees 20 minutes 22 seconds N. and long. 83 degrees 56 minutes 59 seconds W.)

A—0 to 14 inches; very dark grayish brown (10YR 3/2) gravelly fine sandy loam; moderate medium and coarse granular structure; very friable; many fine and medium roots; few fine flakes of mica; 15 percent, by volume, gravel and 5 percent cobbles; strongly acid; abrupt smooth boundary.
BC—14 to 18 inches; dark yellowish brown (10YR 4/4) very cobbly fine sandy loam; weak fine and medium subangular blocky structure; very friable; many fine and medium roots; few fine flakes of mica; 20 percent, by volume, gravel and 20 percent cobbles; very strongly acid; clear wavy boundary.
C—18 to 80 inches; variegated extremely cobbly coarse sand in shades of brown and yellow; single grain; loose; few fine and medium flakes of mica; 20 percent, by volume, gravel, 45 percent cobbles, and 5 percent stones; very strongly acid.

Range in Characteristics

Solum thickness: 8 to 20 inches
Depth to contrasting material: 8 to 20 inches to deposits of cobbles and gravel that are stratified with sandy or loamy material
Depth to bedrock: More than 60 inches
Content of mica flakes: Few or common in the A and B horizons and few to many in the C horizon
Content and size of rock fragments: Less than 35 percent, by volume, in the A and B horizons and more than 35 percent in the C horizon; dominantly gravel or cobbles but including stones
Soil reaction: Very strongly acid to neutral throughout the profile, except where surface layers have been limed

A or Ap horizon:
Color—hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 to 3
Thickness of A horizon—10 to 20 inches
Texture (fine-earth fraction)—fine sandy loam or sandy loam

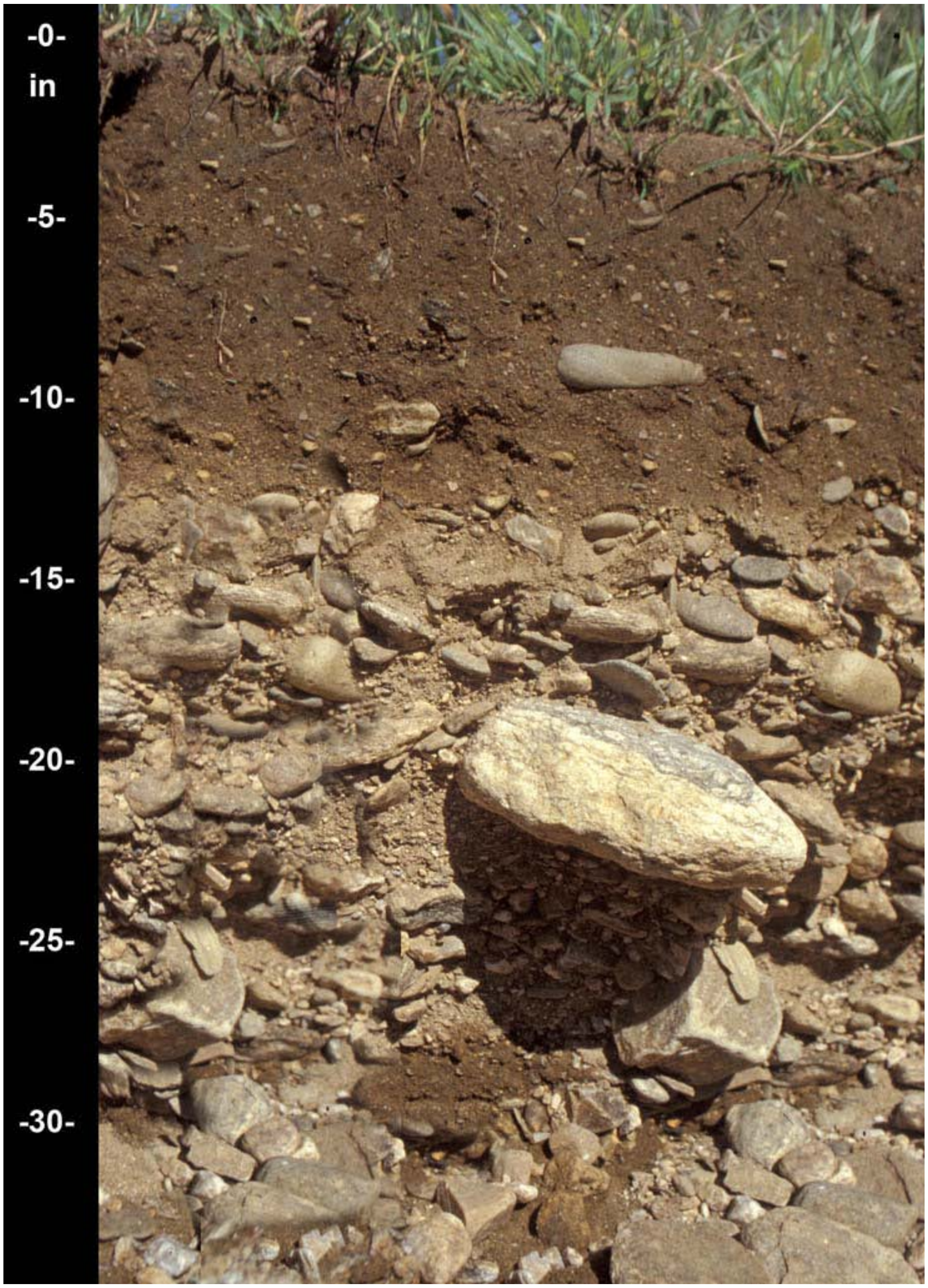


Figure 44.—Typical profile of Dellwood gravelly fine sandy loam. Dellwood soils are very deep and have thick, dark surface layers. They formed in stream-deposited materials consisting mainly of sand, gravel, and cobbles. They dominantly occur at the upper end of flood plain systems throughout the county. (Scale is in inches.)

AC horizon (if it occurs):

Color—hue of 7.5YR or 10YR, value of 3, and chroma of 2 to 4
Texture—coarse sand, sand, loamy coarse sand, or loamy sand

Bw horizon (if it occurs):

Color—hue of 7.5YR or 10YR and value and chroma of 4 to 6
Texture (fine-earth fraction)—sandy loam or fine sandy loam

BC horizon:
Color—hue of 7.5YR or 10YR and value and chroma of 4 to 6
Texture (fine-earth fraction)—sandy loam or fine sandy loam

C horizon:
Color—hue of 10YR, value of 3 to 5, and chroma of 4 to 6 or hue of 2.5Y and value and chroma of 4 to 6
Texture (fine-earth fraction)—coarse sand, sand, loamy coarse sand, or loamy sand alluvium
Redoximorphic features—iron or clay depletions in shades of brown, yellow, olive, or gray; iron accumulations in shades of red, brown, yellow, or olive

Dillard Series

Depth class: Very deep
Drainage class: Moderately well drained
Depth to seasonal high water table: 2.0 to 3.0 feet from December through May and 2.0 to 3.5 feet from June through November
Permeability: Moderately slow
Parent material: Loamy alluvium and colluvium derived from materials weathered from low-grade metasedimentary rock
Landscape: Valleys of low and intermediate mountains and intermountain hills throughout the county
Landform: Low stream terraces
Landform position: Concave to planar toeslopes
Slope range: 1 to 5 percent
Taxonomic classification: Fine-loamy, mixed, semiactive, mesic Aquic Hapludults

Typical Pedon

Dillard loam, 1 to 5 percent slopes, rarely flooded; in Cherokee County, North Carolina; 5 miles southeast of Murphy on U.S. Highway 64, about 1,345 feet east of the intersection of Secondary Road 1531, about 725 feet south in a field; USGS Peachtree topographic quadrangle; lat. 35 degrees 4 minutes 34 seconds N. and long. 83 degrees 58 minutes 28 seconds W. (A representative map unit for Graham County is on USGS Robbinsville topographic quadrangle; lat. 35 degrees 18 minutes 49 seconds N. and long. 83 degrees 49 minutes 15 seconds W.)

Ap—0 to 9 inches; dark brown (10YR 3/3) loam; moderate fine to coarse granular structure; very friable; common fine roots; few fine flakes of mica; moderately acid; abrupt smooth boundary.
Bt1—9 to 32 inches; yellowish brown (10YR 5/4) clay loam; common medium faint brown (10YR 5/3), common medium distinct strong brown (7.5YR 5/8), and common medium prominent red (2.5YR 4/8) mottles; moderate fine to coarse subangular blocky structure; friable; few fine roots; few discontinuous clay films on faces of peds; common fine flakes of mica; moderately acid; clear wavy boundary.
Bt2—32 to 49 inches; yellowish brown (10YR 5/4) clay loam; common medium faint brown (10YR 5/3) mottles; moderate fine to coarse subangular blocky structure; friable; few fine roots; few discontinuous clay films on faces of peds; few fine distinct light brownish gray (10YR 6/2) iron depletions and strong brown (7.5YR 5/8) soft masses of iron accumulation; few thin dark brown (7.5YR 3/4) sand lenses in lower part of horizon; 5 percent, by volume, gravel; common fine flakes of mica; moderately acid; clear wavy boundary.
Btg—49 to 53 inches; light brownish gray (10YR 6/2) loam; common medium faint brown (10YR 5/3) mottles; weak fine to coarse subangular blocky structure; friable; few discontinuous clay films on faces of peds; common medium prominent strong

brown (7.5YR 5/8) and few fine prominent brownish yellow (10YR 6/8) soft masses of iron accumulation; 6 percent, by volume, gravel; many fine flakes of mica; moderately acid; gradual wavy boundary.

Cg—53 to 80 inches; light brownish gray (10YR 6/2) loam; common medium distinct brown (10YR 5/3) mottles; weak fine to coarse subangular blocky structure; friable; common medium prominent strong brown (7.5YR 5/8) and few fine prominent brownish yellow (10YR 6/8) soft masses of iron accumulation; 7 percent, by volume, gravel and 1 percent cobbles; many fine flakes of mica; moderately acid.

Range in Characteristics

Solum thickness: 30 to more than 60 inches
Depth to bedrock: More than 60 inches
Content of mica flakes: Few or common
Content of rock fragments: Less than 5 percent, by volume, in the A, Ap, and BA horizons; less than 10 percent in the Bt horizon; less than 10 percent in the Btg, 2Btg, BCg, and 2BCg horizons; and less than 35 percent in the C, 2C, Cg, and 2Cg horizons
Soil reaction: Strongly acid to moderately acid in the A horizon, except where surface layers have been limed, and very strongly acid to moderately acid in the B and C horizons

Ap horizon:
Color—hue of 10YR, value of 3 to 5, and chroma of 1 to 4; where value is 3 or less, the A horizon is less than 10 inches thick
Texture (fine-earth fraction)—loam, sandy loam, or fine sandy loam

Bt horizon:
Color—hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 8
Texture (fine-earth fraction)—sandy clay loam or clay loam
Redoximorphic features—iron or clay depletions in shades of brown, yellow, olive, or gray; iron accumulations in shades of red, brown, yellow, or olive

Btg horizon and BCg (if it occurs):
Color—hue of 10YR, value of 5 to 7, and chroma of 1 or 2
Texture (fine-earth fraction)—clay loam, loam, or sandy clay loam
Redoximorphic features—iron or clay depletions in shades of gray; iron accumulations in shades of brown or yellow

C horizon (if it occurs):
Color—hue of 10YR to 5Y, value of 5 to 7, and chroma of 3 to 8
Texture (fine-earth fraction)—loam, sandy clay loam, or clay loam alluvium/colluvium
Redoximorphic features—iron or clay depletions in shades of gray; iron accumulations in shades of red, brown, or yellow

Cg horizon:
Color—hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2
Texture (fine-earth fraction)—loam, sandy clay loam, or clay loam alluvium/colluvium
Redoximorphic features—iron or clay depletions in shades of red, yellow, brown, olive, or gray

Ditney Series

Depth class: Moderately deep
Drainage class: Well drained
Depth to seasonal high water table: More than 6.0 feet

Permeability: Moderately rapid
Parent material: Residuum affected by soil creep in the upper solum, weathered from low-grade metasedimentary rock, such as metagraywacke and quartzite
Landscape: Low and intermediate mountains, dominantly in the northwestern, north-central, and southeastern parts of the county
Landform: Ridges and south- to west-facing mountain slopes
Landform position: Summits and side slopes
Slope range: 15 to 95 percent
Taxonomic classification: Coarse-loamy, mixed, semiactive, mesic Typic Dystrudepts

Typical Pedon

Ditney channery sandy loam in an area of Ditney-Unicoi-Rock outcrop complex, 50 to 90 percent slopes, very stony (fig. 45); in Graham County; about 12 miles northwest of Robbinsville, 1.80 miles northeast of U.S. Forest Service Road 416 on Secondary Road 1127, about 270 feet northwest along an old logging road; USGS Tapoco topographic quadrangle; lat. 35 degrees 22 minutes 41 seconds N. and long. 83 degrees 54 minutes 55 seconds W.

A—0 to 3 inches; brown (10YR 4/3) channery sandy loam; moderate fine granular structure; very friable; many fine and few medium roots; 15 percent, by volume, channers; strongly acid; clear smooth boundary.
Bw—3 to 26 inches; dark yellowish brown (10YR 4/6) channery fine sandy loam; weak medium subangular blocky structure parting to moderate medium granular; very friable; many fine and few medium roots; 20 percent, by volume, channers; strongly acid; abrupt wavy boundary.
R—26 to 80 inches; unweathered, hard metagraywacke bedrock.

Range in Characteristics

Solum thickness: 20 to 40 inches
Depth to bedrock: 20 to 40 inches to hard bedrock
Content of mica flakes: None or few
Content and size of rock fragments: Less than 30 percent, by volume; dominantly channers or flagstones but including gravel, cobbles, and stones
Soil reaction: Extremely acid to strongly acid throughout the profile

A horizon:
Color—hue of 10YR, value of 3 to 5, and chroma of 1 to 4; where value is 3 or less, horizon is less than 7 inches thick
Texture (fine-earth fraction)—fine sandy loam, sandy loam, or loam

Bw horizon:
Color—hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 8
Texture (fine-earth fraction)—sandy loam, fine sandy loam, or loam

BC horizon (if it occurs):
Color—hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 8
Texture (fine-earth fraction)—sandy loam, fine sandy loam, or loam
Other characteristics—horizon has coarser textures, more rock fragments, and weaker structures than the Bw horizon

Cr layer (if it occurs):
Type of bedrock—weathered, weakly cemented to strongly cemented, low-grade metasedimentary rock with moderate or high excavation difficulty
Other characterstics—few fine and medium roots in cracks that are spaced more than 4 inches apart

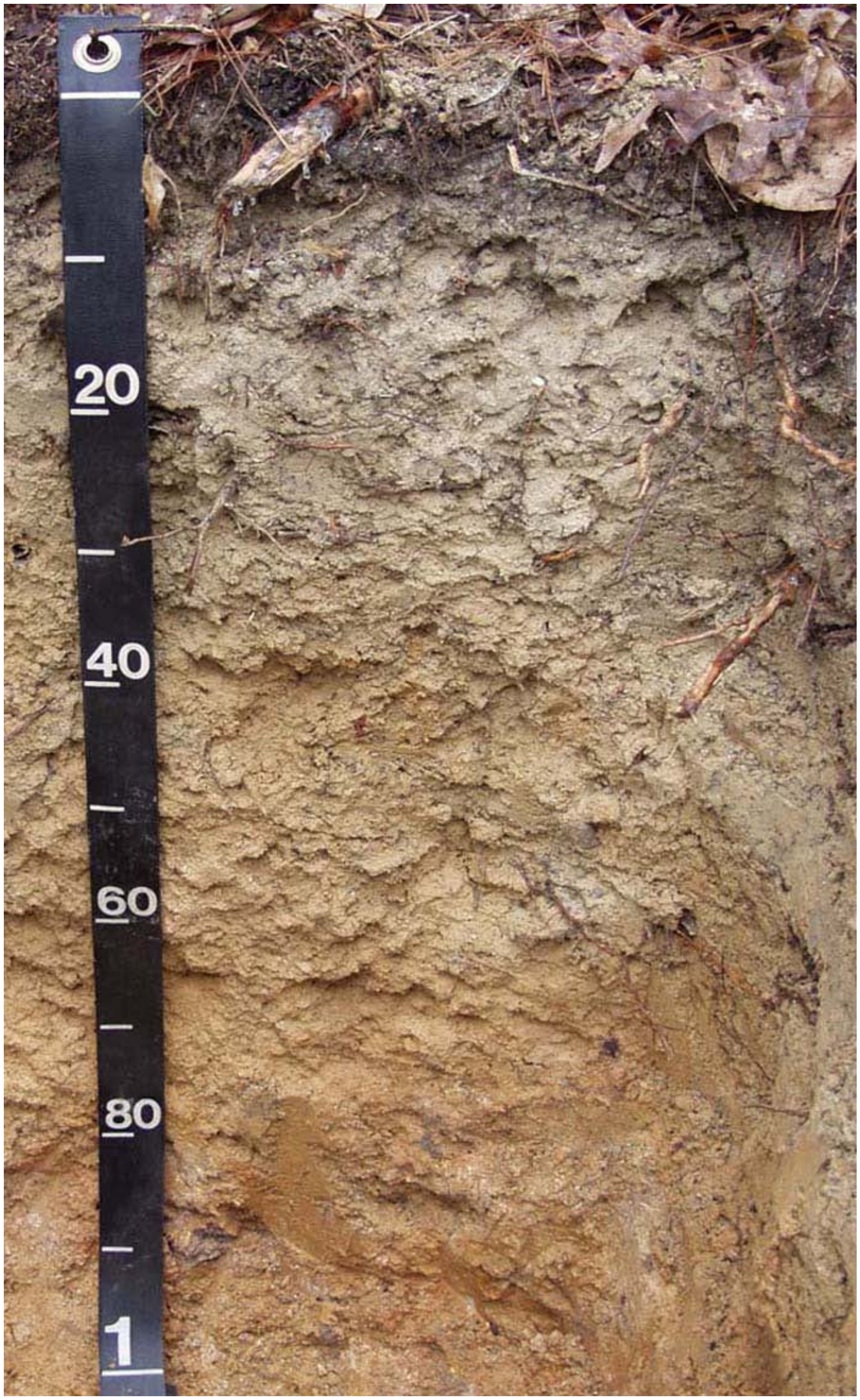


Figure 45.—Typical profile of Ditney channery sandy loam. Ditney soils are moderately deep to unweathered bedrock. They occur on low and intermediate mountains in the western two-thirds of the county. (Scale is in centimeters.)

R layer:

Type of bedrock—unweathered, hard, low-grade metasedimentary rock with very high or extremely high excavation difficulty

Ela Series

Depth class: Very deep
Drainage class: Poorly drained and very poorly drained
Depth to seasonal high water table: 1.0 foot or less from December through May and 0.5 foot to 1.5 feet from June through November
Permeability: Moderately rapid in the surface horizon and upper portion of the underlying material and rapid in the lower portion
Parent material: Recent alluvium that is loamy in the upper part and sandy or sandy-skeletal in the lower part, derived from material weathered from low-grade metasedimentary rock
Landscape: Valleys of low and intermediate mountains throughout the county
Landform: Flood plains
Landform position: Planar to slightly concave bottomland slopes
Slope range: 0 to 3 percent
Taxonomic classification: Coarse-loamy, siliceous, superactive, acid, mesic Fluvaquentic Humaquepts

Typical Pedon

Ela silt loam, 0 to 2 percent slopes, occasionally flooded; in Graham County; about 7 miles southeast of Robbinsville, 10 miles on U.S. Highway 129 to Secondary Road 1200, about 1,400 feet northeast on Secondary Road 1200 to a Department of Transportation maintenance road, 3,000 feet west on the road, 300 feet northwest in woods; USGS Hewitt topographic quadrangle; lat. 35 degrees 16 minutes 30 seconds N. and long. 83 degrees 41 minutes 52 seconds W.

Oe—0 to 1 inch; moderately decomposed organic litter and root mat; abrupt smooth boundary.
A—1 to 16 inches; black (10YR 2/1) silt loam; weak medium subangular blocky structure; very friable; many fine, common medium, and few coarse roots throughout; about 1 percent fine mica flakes; 5 percent, by volume, well rounded gravel and 5 percent cobbles; extremely acid; clear smooth boundary.
Cg—16 to 32 inches; dark grayish brown (10YR 4/2) fine sandy loam; massive; friable; few very fine and fine roots throughout; common fine prominent yellowish red (5YR 4/6) irregularly shaped soft masses of iron accumulation throughout the matrix and few fine distinct light gray (10YR 7/1) cylindrical iron depletions along root channels; about 1 percent fine mica flakes; 5 percent, by volume, well rounded gravel and 5 percent cobbles; very strongly acid; clear smooth boundary.
2Cg—32 to 80 inches; dark grayish brown (10YR 4/2) extremely cobbly sandy loam; massive; very friable; about 1 percent fine mica flakes; 10 percent, by volume, stones, 30 percent well rounded cobbles, and 35 percent well rounded gravel; strongly acid.

Range in Characteristics

Depth to contrasting material: 20 to 40 inches
Depth to bedrock: More than 60 inches
Content of mica flakes: Few or common
Content and size of rock fragments: 5 to 35 percent in horizons above the 2Cg horizon and 35 to 80 percent in the 2Cg horizon; dominantly well rounded gravel or cobbles
Soil reaction: Very strongly acid to slightly acid throughout the profile, except where surface layers have been limed

A or Ap horizon:
Color—hue of 7.5YR or 2.5Y, value of 2 or 3 (less than 5 dry), and chroma of 1 to 3

Thickness of A horizon—10 to 22 inches
Texture (fine-earth fraction)—silt loam, loam, fine sandy loam, or sandy loam
Redoximorphic features—iron or clay depletions in shades of brown, yellow, olive, or gray

AC horizon (if it occurs):
Color—hue of 7.5YR or 2.5Y, value of 2 or 3, and chroma of 1 to 3
Texture (fine-earth fraction)—sandy loam, fine sandy loam, or loam
Redoximorphic features—iron or clay depletions in shades of brown, yellow, olive, or gray

Cg horizon:
Color—hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 to 2
Texture (fine-earth fraction)—sandy loam, fine sandy loam, loamy fine sand, loamy sand, or coarse sandy loam alluvium
Redoximorphic features—iron or clay depletions in shades of brown, yellow, olive, or gray

2Cg horizon:
Color—hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 to 2
Texture (fine-earth fraction)—sandy loam, fine sandy loam, sand, coarse sand, loamy sand, fine sand, loamy fine sand, or coarse sandy loam alluvium
Other characteristics—horizon is at or below the free water table and is continually saturated year-round

Fluvaquents

Depth class: Very deep
Drainage class: Poorly drained and very poorly drained
Depth to seasonal high water table: 1.0 foot or less from December through May and 0.5 foot to 1.5 feet from June through November
Permeability: Moderate
Parent material: Loamy material (originally, recent alluvium derived from low-grade metasedimentary rock)
Landscape: Valleys of low and intermediate mountains at the head of Tallulah Creek in the southeastern part of the county
Landform: Flood plains in the southeastern part of the county
Landform position: Planar to slightly concave bottomland slopes
Slope range: 0 to 3 percent
Taxonomic classification: Fluvaquents

Description

Fluvaquents consist of areas where the soil has been disturbed by excavation or covered by fill material. Operations such as dozing, backfilling, trenching, or excavating have completely altered the characteristics of the soil so that it can no longer be identified with the original series. These areas are poorly drained or very poorly drained.

Fluvaquents have colors in shades of brown, gray, and black. The texture is also variable and includes loam, silt loam, and silty clay loam. The soil material ranges in reaction from extremely acid to neutral. A typical pedon is not given due to the variable nature of the soil.

Range in Characteristics

Solum thickness: 40 to 60 inches
Depth to contrasting material: 40 to 60 inches or more to sand and more than 60 inches to deposits of gravel and cobbles stratified with sandy or loamy material

Depth to bedrock: More than 60 inches
Content of mica flakes: Few or common
Content and size of rock fragments: Less than 15 percent, by volume, to a depth of 40 inches, and less than 50 percent below a depth of 40 inches; dominantly gravel
Soil reaction: Very strongly acid to neutral throughout the profile

A horizon (if it occurs):
Color—hue 10YR, value of 2 or 3, and chroma of 0 to 3
Thickness—10 to 20 inches
Texture (fine-earth fraction)—silt loam or loam

Cg horizon:
Color—hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 0 to 2
Texture (fine-earth fraction)—clay loam, sandy clay loam, loam, silt loam, silty clay loam, sandy loam, or fine sandy loam that commonly has lenses and strata of loamy sand or sand alluvium; strata containing 15 to 60 percent gravel and cobbles occur in some pedons below a depth of 40 inches
Redoximorphic features—iron or clay depletions in shades of brown, yellow, olive, or gray; iron accumulations in shades of red, brown, yellow, or olive

Heintooga Series

Depth class: Very deep
Drainage class: Well drained
Depth to seasonal high water table: More than 6.0 feet
Parent material: Colluvium derived from low-grade metasedimentary rock
Landscape: High mountains in the western and eastern parts of the county
Landform: Coves and drainageways
Landform position: Head slopes, footslopes, and toeslopes
Slope range: 15 to 50 percent
Taxonomic classification: Loamy-skeletal, isotic, frigid Typic Humudepts

Typical Pedon

Heintooga very flaggy loam in an area of Chiltoskie-Heintooga complex, 15 to 30 percent slopes, stony; in Swain County, North Carolina (Great Smoky Mountains National Park); at the Balsam picnic area, on Balsam Mountain Road, 500 feet south of the parking area; USGS Bunches Bald topographic quadrangle; lat. 35 degrees 34 minutes 17 seconds N. and long. 83 degrees 10 minutes 48 seconds W. (A representative map unit for Graham County is on USGS Big Junction topographic quadrangle; lat. 35 degrees 18 minutes 16 seconds N. and long. 84 degrees 1 minute 19 seconds W.)

Oe—0 to 1 inch; moderately decomposed organic litter and root mat; abrupt smooth boundary.
A1—1 to 4 inches; very dark brown (10YR 2/2) very flaggy loam; moderate fine to very coarse granular structure; very friable; common very fine and fine and many medium to very coarse roots throughout; 25 percent, by volume, channers and 20 percent flagstones; few fine flakes of mica; ultra acid; abrupt wavy boundary.
A2—4 to 12 inches; dark brown (10YR 3/3) very flaggy loam; moderate very fine to coarse granular structure; friable; many medium to very coarse roots throughout; 25 percent, by volume, channers and 20 percent flagstones; few fine flakes of mica; extremely acid; gradual wavy boundary.
Bw—12 to 25 inches; brown (10YR 4/3) extremely channery fine sandy loam; moderate very fine to coarse subangular blocky structure; friable; common medium and coarse roots throughout; 60 percent, by volume, channers and

10 percent flagstones; few fine flakes of mica; extremely acid; gradual wavy boundary.

BC—25 to 80 inches; yellowish brown (10YR 5/6) extremely flaggy coarse sandy loam; common medium to very coarse prominent yellowish red (5YR 4/6) mottles; weak fine to coarse subangular blocky structure; very friable; 35 percent, by volume, channers and 35 percent flagstones; few fine flakes of mica; very strongly acid.

Range in Characteristics

Solum thickness: 35 to more than 60 inches
Depth to bedrock: More than 60 inches
Content of mica flakes: None or few
Content and size of rock fragments: 35 to 80 percent throughout the profile; amount typically increases as depth increases; ranging from channers to boulders
Soil reaction: Ultra acid to strongly acid throughout the profile, except where surface layers have been limed

A horizon:
Color—hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 to 3
Combined thickness of A horizons—10 to 20 inches
Texture (fine-earth fraction)—loam or fine sandy loam

Bw horizon:
Color—hue of 7.5YR to 2.5YR, value of 3 to 6, and chroma of 3 to 8
Texture (fine-earth fraction)—loam or fine sandy loam

BC horizon:
Color—hue of 10YR or 2.5YR, value of 4 or 6, and chroma of 4 to 8
Texture (fine-earth fraction)—sandy loam or coarse sandy loam colluvium

C horizon (if it occurs):
Color—hue of 10YR or 2.5YR, value of 4 or 6, and chroma of 4 to 8
Texture (fine-earth fraction)—sandy loam or coarse sandy loam colluvium

Hemphill Series

Depth class: Very deep
Drainage class: Very poorly drained
Depth to seasonal high water table: 1.0 foot or less from December through May and 0.5 foot to 1.5 feet from June through November
Permeability: Moderately slow in the surface horizon, slow in the subsoil, and moderate in the underlying material
Parent material: Alluvium derived from materials weathered from low-grade metasedimentary rock
Landscape: Valleys of intermountain hills and low and intermediate mountains; dominantly near Robbinsville and along Tallulah and Sweetwater Creeks, in the central and southeastern parts of the county
Landform: Low stream terraces
Landform position: Planar to slightly concave bottomland slopes
Slope range: 0 to 3 percent
Taxonomic classification: Fine, mixed, active, mesic Umbric Endoaqualfs

Typical Pedon

Hemphill loam, 0 to 3 percent slopes, rarely flooded; in Cherokee County, North Carolina; 5 miles east of Murphy on U.S. Highway 64, about 860 feet south in a field; USGS Peachtree topographic quadrangle; lat. 35 degrees 4 minutes 29 seconds N.

and long. 83 degrees 58 minutes 19 seconds W. (A representative pedon for Graham County is on USGS Hewitt topographic quadrangle; lat. 35 degrees 16 minutes 13 seconds N. and long. 83 degrees 42 minutes 31 seconds W.)

Ap—0 to 11 inches; dark brown (10YR 3/3) loam; moderate fine and medium granular structure; very friable; many fine roots; few fine flakes of mica; strongly acid; abrupt smooth boundary.

Btg1—11 to 23 inches; light gray (10YR 7/2) clay loam; moderate fine and medium subangular blocky structure; firm; common fine roots; few discontinuous clay films on faces of peds; few fine flakes of mica; very strongly acid; gradual wavy boundary.

Btg2—23 to 34 inches; light gray (10YR 7/2) clay loam; moderate fine and medium subangular blocky structure; friable; few fine roots; few discontinuous clay films on faces of peds; many medium prominent brownish yellow (10YR 6/8) soft masses of iron accumulation; few fine flakes of mica; strongly acid; gradual wavy boundary.

Btg3—34 to 80 inches; light gray (10YR 7/2) clay loam; moderate fine and medium subangular blocky structure; friable; few discontinuous clay films on faces of peds; many medium prominent strong brown (7.5YR 5/8) soft masses of iron accumulation; 5 percent, by volume, gravel; common fine flakes of mica; very strongly acid.

Range in Characteristics

Solum thickness: 40 to more than 60 inches

Depth to bedrock: More than 60 inches

Content of mica flakes: Few or common in the upper part and few to many in the lower part

Content of rock fragments: Less than 10 percent, by volume

Soil reaction: Very strongly acid to neutral throughout the profile, except where surface layers have been limed

A or Ap horizon:

Color—hue of 7.5YR to 2.5Y, value of 2 or 3, and chroma of 0 or 3

Thickness of A horizon—7 to 14 inches

Texture (fine-earth fraction)—loam, silt loam, clay loam, or silty clay loam

AB or BA horizon (if it occurs):

Color—horizon has hue of 7.5YR to 2.5Y, value of 2 or 3, and chroma of 0 or 3 or is neutral in hue and has value of 2 or 3

Texture (fine-earth fraction)—clay loam, silty clay loam, or sandy clay loam

Btg horizon:

Color—dominantly hue of 7.5YR to 5Y, value of 2 or 6, and chroma of 0 or 2; hue of 5G, 5BG, or 5B, value of 4 to 7, and chroma of 1 in some pedons

Texture (fine-earth fraction)—clay loam, silty clay loam, silty clay, or clay

Redoximorphic features—iron or clay depletions in shades of red, yellow, brown, olive, or gray

BCg horizon (if it occurs):

Color—horizon typically has hue of 7.5YR to 5Y, value of 4 or 6, and chroma of 0 or 2 or is neutral in hue and has value of 1 or 2; horizon has hue of 5G, 5BG, or 5B, value of 4 to 7, and chroma of 1 in some pedons

Texture (fine-earth fraction)—sandy loam, fine sandy loam, sandy clay loam, loam, silt loam, silty clay loam, silty clay, clay loam, or clay

Redoximorphic features—iron or clay depletions in shades of red, yellow, brown, olive, or gray

Cg horizon (if it occurs):

Color—horizon typically has hue of 7.5YR to 5Y, value of 2 or 6, and chroma of 0 or 2 or is neutral in hue and has value of 1 or 2; horizon has hue of 5G, 5BG, or 5B, value of 4 to 7, and chroma of 1 in some pedons

Texture (fine-earth fraction)—sand, sandy loam, fine sandy loam, sandy clay loam, loam, silt loam, or silty clay loam alluvium

Redoximorphic features—iron or clay depletions in shades of red, yellow, brown, olive, or gray

Jeffrey Series

Depth class: Moderately deep
Drainage class: Well drained
Depth to seasonal high water table: More than 6.0 feet
Permeability: Moderately rapid
Parent material: Residuum affected by soil creep in the upper solum, weathered from low-grade metasedimentary rock, such as metagraywacke
Landscape: Intermediate mountains in the western part of the county
Landform: Ridges, north- to east-facing hillslopes and mountain slopes, and those slopes shaded by the higher mountains
Landform position: Summits and side slopes
Slope range: 15 to 95 percent
Taxonomic classification: Fine-loamy, isotic, mesic Humic Dystrudepts

Typical Pedon

Jeffrey channery loam in an area of Cheoah-Jeffrey complex, 15 to 30 percent slopes, rocky; on the line between Graham County, North Carolina, and Monroe County, Tennessee; about 7 miles northwest of Robbinsville and 2.0 miles northeast of N.C. Highway 165 and U.S. Forest Service Road 95 on U.S. Forest Service Road 95, above Trail 149; USGS Big Junction topographic quadrangle; lat. 35 degrees 21 minutes 37 seconds N. and long. 84 degrees 1 minute 9 seconds W.

A1—0 to 3 inches; very dark grayish brown (10YR 3/2) channery loam; weak fine and medium granular structure; very friable; many fine and medium roots; few fine flakes of mica; 20 percent, by volume, metasandstone channers; strongly acid; clear wavy boundary.

A2—3 to 8 inches; dark brown (10YR 3/3) channery loam; weak medium granular structure; friable; many fine and medium roots; few fine flakes of mica; 20 percent, by volume, metasandstone channers; strongly acid; clear wavy boundary.

Bw1—8 to 13 inches; brown (10YR 4/3) channery loam; weak medium subangular blocky and medium granular structure; friable; common fine and medium roots; few fine flakes of mica; 25 percent, by volume, metasandstone channers; strongly acid; clear wavy boundary.

Bw2—13 to 27 inches; dark yellowish brown (10YR 4/4) channery loam; weak medium subangular blocky structure; friable; common fine and medium roots; few fine flakes of mica; 30 percent, by volume, metasandstone channers; strongly acid; clear smooth boundary.

C—27 to 34 inches; brown (10YR 5/3) channery sandy loam; massive; friable; few fine flakes of mica; 30 percent, by volume, metasandstone channers; strongly acid; clear wavy boundary.

R—34 to 80 inches; unweathered, hard arkosic metasandstone bedrock.

Range in Characteristics

Solum thickness: 18 to 35 inches
Depth to bedrock: 20 to 40 inches to hard bedrock

Content of mica flakes: Few or common
Content and size of rock fragments: Less than 30 percent, by volume; dominantly channers or flagstones but including gravel, cobbles, and stones
Soil reaction: Very strongly acid or strongly acid throughout the profile

A horizon:
Color—hue of 10YR and value and chroma of 2 to 3
Combined thickness of A horizons—greater than 7 inches
Texture (fine-earth fraction)—loam, fine sandy loam, or sandy clay loam

Bw horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 3 to 6
Texture (fine-earth fraction)—loam, sandy loam, fine sandy loam, or sandy clay loam

C horizon:
Color—hue of 10YR, value of 4 or 5, and chroma of 4 to 6
Texture (fine-earth fraction)—loam, sandy loam, or fine sandy loam saprolite

Cr layer (if it occurs):
Type of bedrock—weathered, weakly cemented to strongly cemented, low-grade metasedimentary rock with moderate or high excavation difficulty
Other characteristics—few fine and medium roots in cracks that are spaced more than 4 inches apart

R layer:
Type of bedrock—unweathered, hard, low-grade metasedimentary rock with very high or extremely high excavation difficulty

Junaluska Series

Depth class: Moderately deep
Drainage class: Well drained
Depth to seasonal high water table: More than 6.0 feet
Permeability: Moderate
Parent material: Residuum affected by soil creep in the upper solum, weathered from low-grade metasedimentary rock, such as metagraywacke and metasandstone
Landform: Low and intermediate mountains and intermountain hills, dominantly in the central, northern, and eastern parts of the county
Landform position: Summits and side slopes
Slope range: 8 to 95 percent
Taxonomic classification: Fine-loamy, mixed, subactive, mesic Typic Hapludults

Typical Pedon

Junaluska fine sandy loam in an area of Junaluska-Brasstown complex, 15 to 30 percent slopes (fig. 46); in Cherokee County, North Carolina; about 6 miles west of Murphy, 7.50 miles west on U.S. Highway 64 to Secondary Road 1301, west on Secondary Road 1301 to Secondary Road 1302, northwest on Secondary Road 1302 to Secondary Road 1303, northeast on Secondary Road 1303 to U.S. Forest Service Road 307, about 0.5 mile west of U.S. Forest Service Road 6068 on U.S. Forest Service Road 307, in woods; USGS Persimmon Creek topographic quadrangle; lat. 35 degrees 5 minutes 32 seconds N. and long. 84 degrees 8 minutes 8 seconds W. (A representative map unit for Graham County is on USGS Santeetlah Creek topographic quadrangle; lat. 35 degrees 19 minutes 50 seconds N. and long. 84 degrees 52 minutes 18 seconds W.)

Figure 46.—Typical profile of Junaluska fine sandy loam. Junaluska soils are moderately deep to weathered bedrock. They occur on intermountain hills and low mountains in the eastern two-thirds of the county. (Scale is in centimeters.)

Oe—0 to 2 inches; moderately decomposed organic litter and root mat; abrupt smooth boundary.

A1—2 to 4 inches; brown (7.5YR 5/4) fine sandy loam; weak medium granular structure; very friable; common fine, medium, and coarse roots; common fine mica flakes; 5 percent, by volume, metasandstone channers; extremely acid; clear wavy boundary.

A2—4 to 11 inches; strong brown (7.5YR 5/6) fine sandy loam; weak medium granular structure; very friable; common fine, medium, and coarse roots; common fine mica flakes; 5 percent, by volume, metasandstone channers; very strongly acid; clear wavy boundary.

Bt—11 to 21 inches; yellowish red (5YR 5/8) sandy clay loam; common coarse distinct red (2.5YR 4/8) mottles; moderate medium subangular blocky structure; friable; slightly sticky, slightly plastic; few medium roots; few faint clay films on faces of peds; common fine mica flakes; 5 percent, by volume, metasandstone channers; strongly acid; clear wavy boundary.

C/B—21 to 26 inches; thin parallel layers of yellowish red (5YR 5/8) and red (2.5YR 4/8) fine sandy loam saprolite and sandy clay loam B horizon material; saprolite is massive and B horizon material has weak medium subangular blocky structure; friable; common fine mica flakes; 5 percent, by volume, metasandstone channers; strongly acid; clear irregular boundary.

Cr—26 to 80 inches; weathered, moderately cemented metasandstone; high excavation difficulty; few fine and medium roots in cracks that are spaced more than 4 inches apart.

Range in Characteristics

Solum thickness: 15 to 39 inches

Depth to bedrock: 20 to 40 inches to weathered bedrock

Content of mica flakes: Few or common

Content and size of rock fragments: Less than 30 percent, by volume; dominantly channers but ranging to flagstones in the B/C, BC, and C horizons

Soil reaction: Extremely acid to moderately acid throughout the profile, except where surface layers have been limed

A horizon or Ap horizon (if it occurs):

Color—hue of 10YR to 5YR, value of 3 to 5, and chroma of 3 to 8; where value is 3 or less, the A horizon is less than 7 inches thick

Texture (fine-earth fraction)—loam, silt loam, or fine sandy loam

BA horizon (if it occurs):

Color—hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8

Texture (fine-earth fraction)—loam, silt loam, sandy loam, or fine sandy loam

Bt horizon:

Color—hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8; at least part of the horizon has hue of 2.5YR or 5YR

Texture (fine-earth fraction)—clay loam, loam, silty clay loam, or sandy clay loam

BC horizon (if it occurs):

Color—hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8

Texture (fine-earth fraction)—loam, sandy loam, or fine sandy loam

C/B or C horizon (if it occurs):

Color—horizon is multicolored in shades of red, brown, yellow, gray, or white

Texture (fine-earth fraction)—fine sandy loam, loam, sandy loam, or loamy fine sand saprolite

Other characteristics—thin parallel layers of saprolite and Bt horizon material may occur along fracture planes

Cr layer:

Type of bedrock—weathered, weakly cemented to strongly cemented, low-grade metasedimentary rock with moderate or high excavation difficulty

Other characteristics—few fine and medium roots in cracks that are spaced more than 4 inches apart

Lonon Series

Depth class: Very deep
Drainage class: Well drained
Depth to seasonal high water table: More than 6.0 feet
Permeability: Moderately rapid in the surface horizon, moderate in the subsoil, and moderately rapid in the underlying material
Parent material: Colluvium derived from low-grade metasedimentary rock
Landscape: Intermountain hills and low and intermediate mountains, dominantly in the central and eastern parts of the county
Landform: Coves, colluvial fans, drainageways, and benches
Landform position: Head slopes, footslopes, and toeslopes
Slope range: 8 to 50 percent
Taxonomic classification: Fine-loamy, mixed, semiactive, mesic Typic Hapludults

Typical Pedon

Lonon channery loam in an area of Lonon-Northcove complex, 8 to 15 percent slopes, bouldery (fig. 47); in Cherokee County, North Carolina; about 15 miles northwest of Murphy, 0.8 mile northeast of Secondary Road 1325 on Secondary Road 1327, about 0.85 mile north on U.S. Forest Service Road 50, about 150 feet northwest in woods; USGS Unaka topographic quadrangle; lat. 35 degrees 14 minutes 22 seconds N. and long. 83 degrees 13 minutes 39 seconds W. (A representative map unit for Graham County is on USGS Hewitt topographic quadrangle; lat. 35 degrees 21 minutes 42 seconds N. and long. 83 degrees 39 minutes 13 seconds W.)

Oe—0 to 1 inch; moderately decomposed organic litter and root mat; abrupt smooth boundary.
A—1 to 8 inches; dark yellowish brown (10YR 4/4) channery loam; moderate fine and medium granular structure; very friable; common medium to very coarse roots; 17 percent, by volume, channers; moderately acid; clear smooth boundary.
Bt1—8 to 30 inches; strong brown (7.5YR 4/6) channery clay loam; moderate medium subangular blocky structure; very friable; common distinct clay films on faces of peds; few medium, coarse, and very coarse roots; 17 percent, by volume, channers; strongly acid; gradual wavy boundary.
Bt2—30 to 40 inches; strong brown (7.5YR 5/6) channery clay loam; moderate medium subangular blocky structure; very friable; common distinct clay films on faces of peds; few medium, coarse, and very coarse roots; 17 percent, by volume, channers and 5 percent flagstones; strongly acid; gradual wavy boundary.
Bt3—40 to 80 inches; strong brown (7.5YR 5/6) channery loam; weak medium subangular blocky structure; very friable; common distinct clay films on faces of peds; 20 percent, by volume, channers and 10 percent flagstones; strongly acid.

Range in Characteristics

Solum thickness: 40 to more than 60 inches
Depth to bedrock: More than 60 inches
Content of mica flakes: Few or common
Content and size of rock fragments: Less than 35 percent, by volume, in the A and Bt horizons and less than 60 percent in the BC and C horizons; ranging from channers to stones
Soil reaction: Extremely acid to moderately acid throughout the profile, except where surface layers have been limed

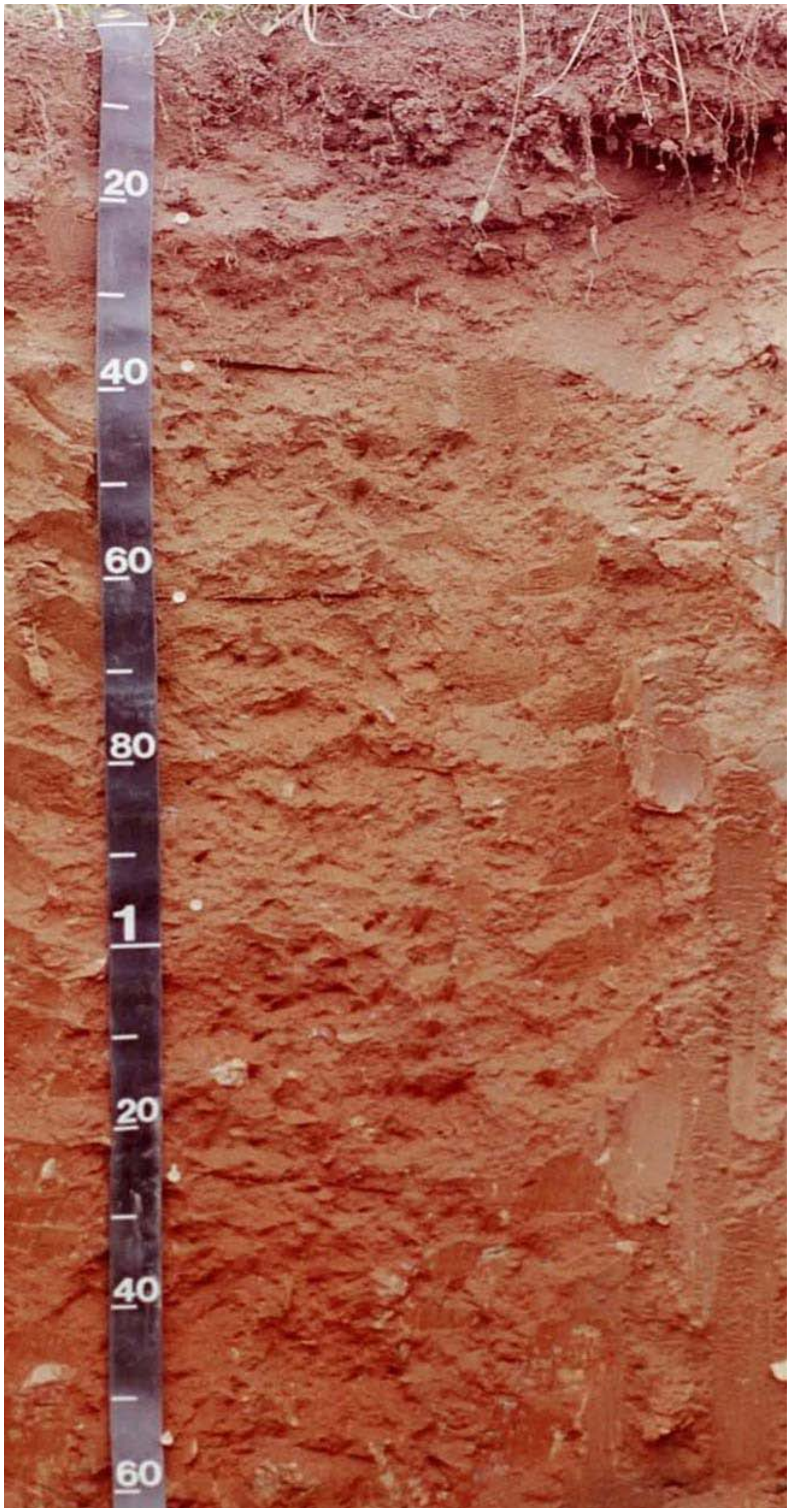


Figure 47.—Typical profile of Lonon channery loam. Lonon soils are very deep and formed in fine-loamy colluvium. They occur in coves and drainageways on low and intermediate mountains, dominantly in the central and eastern parts of the county. (Scale is in inches.)

A horizon:
Color—hue of 7.5YR or 10YR, value of 3 or 5, and chroma of 3 to 4; where value and chroma are 3 or less, horizon is less than 7 inches thick
Texture (fine-earth fraction)—loam or fine sandy loam

BA horizon (if it occurs):
Color—hue of 7.5YR or 10YR, value of 3 or 5, and chroma of 3 or 4
Texture (fine-earth fraction)—loam or fine sandy loam

Bt horizon:
Color—hue of 5YR to 10YR, value of 4 to 6, and chroma of 4 to 8
Texture (fine-earth fraction)—sandy clay loam, loam, or clay loam

BC horizon (if it occurs):
Color—hue of 5YR to 10YR, value of 4 to 6, and chroma of 4 to 8
Texture (fine-earth fraction)—loam, fine sandy loam, sandy clay loam, or clay loam

C horizon (if it occurs):
Color—hue of 5YR to 10YR, value of 4 to 6, and chroma of 4 to 8
Texture (fine-earth fraction)—loam, sandy loam, or fine sandy loam colluvium

Luftee Series

Depth class: Moderately deep
Drainage class: Well drained
Depth to seasonal high water table: More than 6.0 feet
Permeability: Moderately rapid
Parent material: Residuum affected by soil creep in the upper solum, weathered from low-grade metasedimentary rock, primarily sulfidic slate
Landscape: High mountains, around Cheoah Bald to the east near Swain County and around Joanna Bald in the southern part of the county near Cherokee County
Landform: Ridges and mountain slopes
Landform position: Summits and side slopes
Slope range: 15 to 95 percent
Taxonomic classification: Loamy-skeletal, isotic, frigid Humic Dystrudepts

Typical Pedon

Luftee very channery loam in an area of Luftee-Anakeesta complex, windswept, 50 to 95 percent slopes, very rocky (fig. 48); in Sevier County, Tennessee (Great Smoky Mountains National Park); about 13.0 miles north of Bryson City, 1,700 feet north on U.S. Highway 441 from Newfound Gap parking area on the Tennessee side, 150 feet upslope (east) from the road pull-off; USGS Clingmans Dome topographic quadrangle; lat. 35 degrees 36 minutes 48 seconds N. and long. 83 degrees 25 minutes 21 seconds W. (A representative map unit for Graham County is on USGS Hewitt topographic quadrangle; lat. 35 degrees 19 minutes 1 second N. and long. 83 degrees 41 minutes 2 seconds W.)

Oe—0 to 1 inch; moderately decomposed organic litter and root mat; abrupt smooth boundary.
A—1 to 11 inches; very dark brown (10YR 2/2) very channery loam; moderate medium granular structure; very friable; many medium to very coarse and common very fine and fine roots; 20 percent, by volume, slate channers and 5 percent metasandstone channers; extremely acid; clear wavy boundary.
Bw1—11 to 20 inches; very dark grayish brown (10YR 3/2) extremely channery loam; weak medium and coarse subangular blocky structure; friable; 40 percent, by volume, slate channers, 15 percent metasandstone channers, and 10 percent quartz gravel; very strongly acid; gradual wavy boundary.

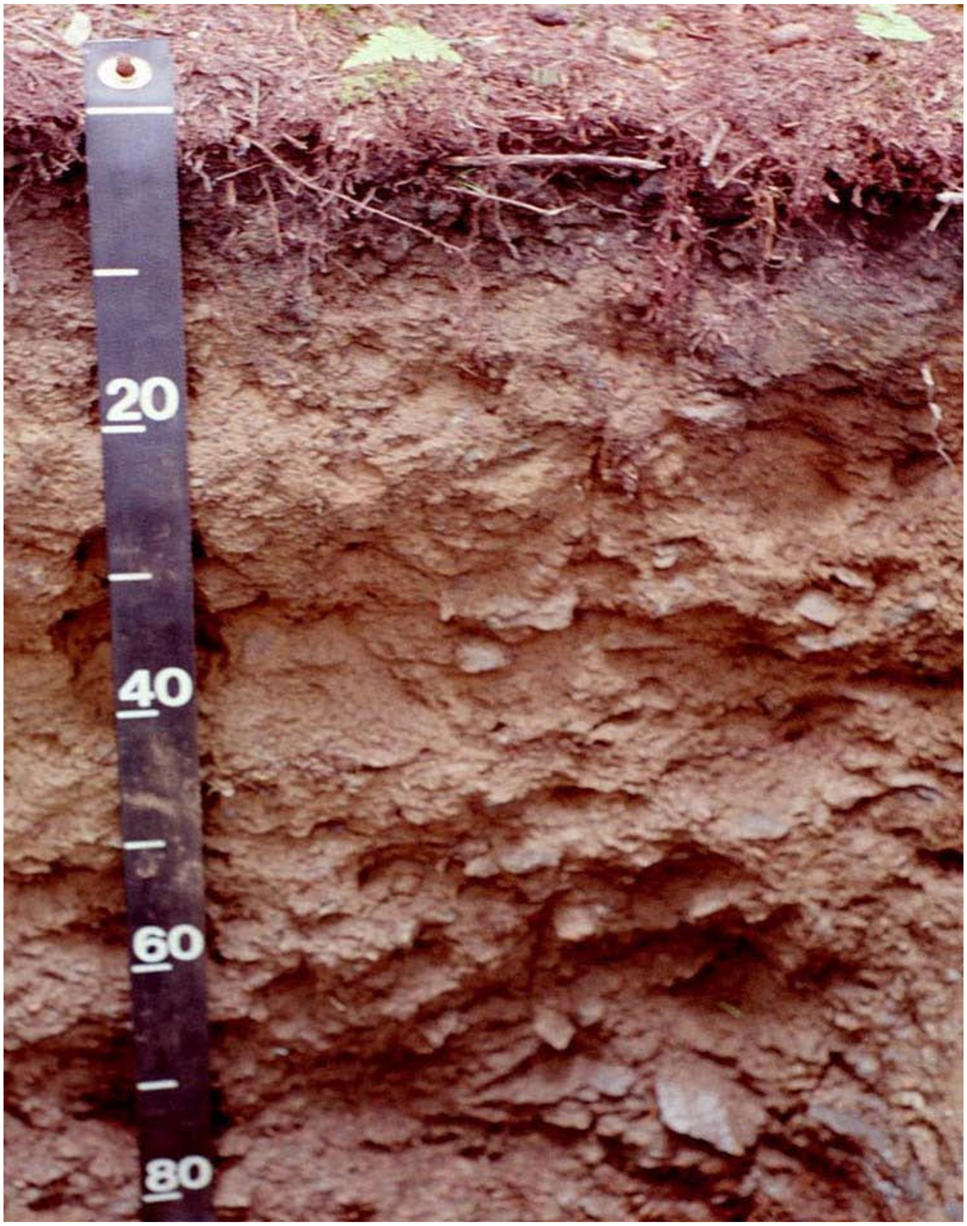


Figure 48.—Typical profile of Luftee very channery loam. Luftee soils are moderately deep with skeletal material over weathered, high-sulfur bedrock and have thick, dark surface layers. They occur on high mountains near Cheoah Bald. (Scale is in centimeters.)

Bw2—20 to 34 inches; yellowish brown (10YR 5/4) extremely channery sandy loam; weak medium and coarse subangular blocky structure; friable; 40 percent, by volume, slate channers, 15 percent metasandstone channers, and 10 percent quartz gravel; very strongly acid; abrupt wavy boundary.

R—34 to 80 inches; unweathered, hard Anakeesta slate bedrock.

Range in Characteristics

Solum thickness: 20 to 40 inches
Depth to bedrock: 20 to 40 inches
Content of mica flakes: None or few

Content of rock fragments: 15 to 65 percent, by volume, in the A horizon and upper Bw horizons and 50 to 75 percent in the lower Bw horizons
Soil reaction: Extremely acid or very strongly acid throughout the profile

A horizon:
Color—hue of 10YR, value of 2 or 3, and chroma of 1 to 3
Thickness—7 to 14 inches
Texture (fine-earth fraction)—loam, silt loam, or clay loam

Bw horizon:
Color—hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 2 to 6
Texture (fine-earth fraction)—loam, sandy loam, or silt loam

R layer:
Type of bedrock—unweathered, hard, low-grade metasedimentary slate rock with very high or extremely high excavation difficulty

Northcove Series

Depth class: Very deep
Drainage class: Well drained
Depth to seasonal high water table: More than 6.0 feet
Permeability: Moderately rapid
Parent material: Colluvium derived from low-grade metasedimentary rock
Landscape: Low and intermediate mountains and intermountain hills throughout the county
Landform: Coves, colluvial fans, drainageways, and benches
Landform position: Head slopes, footslopes, and toeslopes
Slope range: 8 to 50 percent
Taxonomic classification: Loamy-skeletal, mixed, semiactive, mesic Typic Dystrudepts

Typical Pedon

Northcove very channery loam in an area of Lonon-Northcove complex, 8 to 15 percent slopes, bouldery (fig. 49); in Cherokee County, North Carolina; about 15 miles northwest of Murphy, 0.8 mile northeast of Secondary Road 1325 on Secondary Road 1327, about 0.8 mile north on U.S. Forest Service Road 50, about 150 feet southeast in woods; USGS Unaka topographic quadrangle; lat. 35 degrees 21 minutes 42 seconds N. and long. 83 degrees 39 minutes 13 seconds W. (A representative map unit for Graham County is on USGS Hewitt topographic quadrangle; lat. 35 degrees 21 minutes 42 seconds N. and long. 83 degrees 39 minutes 13 seconds W.)

Oe—0 to 1 inch; moderately decomposed organic litter and root mat; abrupt smooth boundary.
A—1 to 8 inches; dark yellowish brown (10YR 4/4) very channery loam; moderate fine and medium granular structure; very friable; many medium and coarse roots throughout; 40 percent, by volume, channers; extremely acid; clear smooth boundary.
Bw1—8 to 30 inches; strong brown (7.5YR 5/6) very channery loam; weak medium subangular blocky structure; very friable; few medium, coarse, and very coarse roots; 35 percent, by volume, channers and 15 percent flagstones; very strongly acid; gradual wavy boundary.
Bw2—30 to 80 inches; strong brown (7.5YR 5/6) extremely channery loam; weak medium subangular blocky structure; very friable; 40 percent, by volume, channers and 20 percent flagstones; very strongly acid.

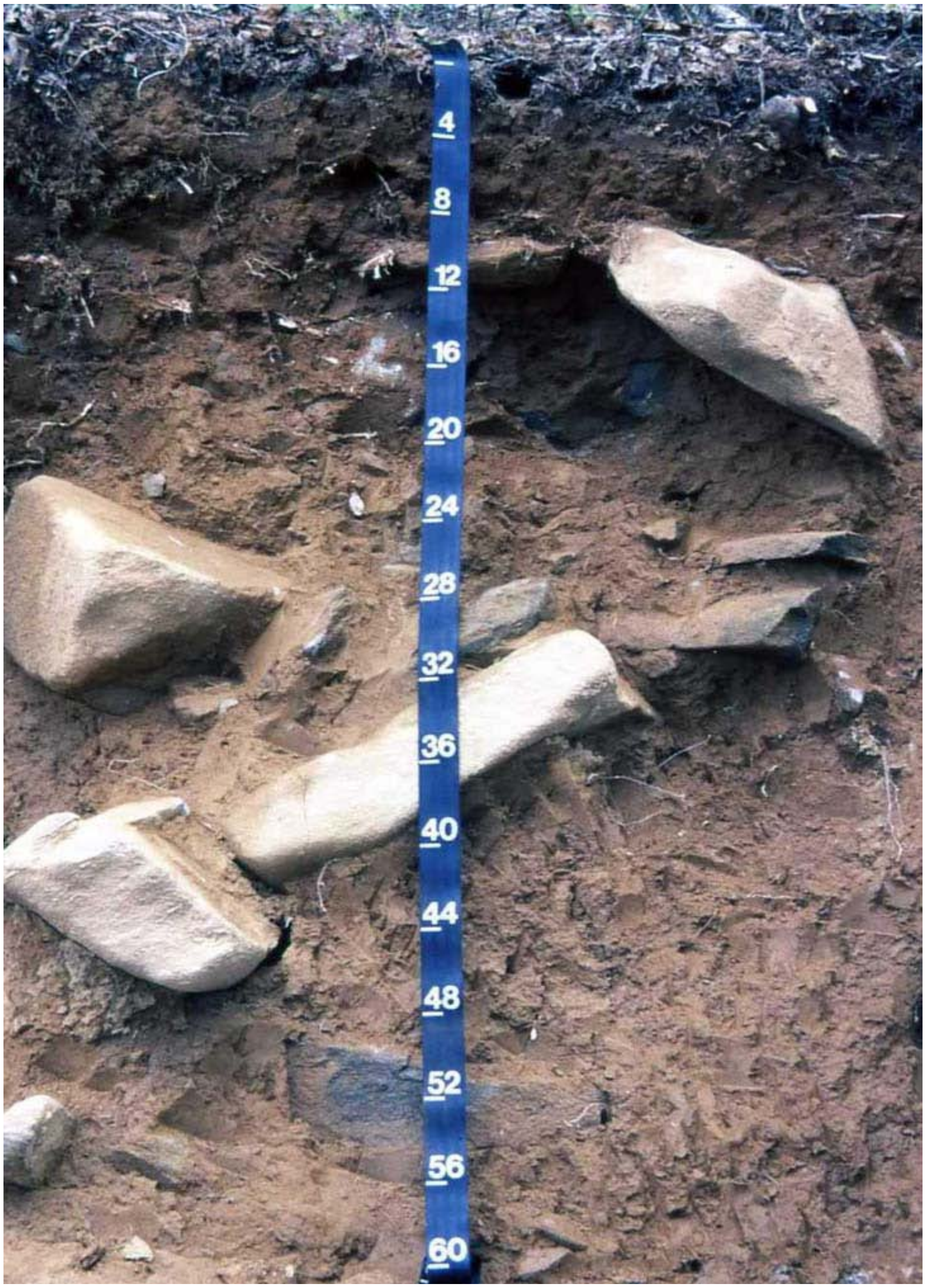


Figure 49.—Typical profile of Northcove very channery loam. Northcove soils are very deep, have many rock fragments in the subsoil, and formed in colluvium. They occur in coves and drainageways on low and intermediate mountains, dominantly in the central and eastern parts of the county. (Scale is in inches.)

Range in Characteristics

Solum thickness: 35 to more than 60 inches
Depth to bedrock: More than 60 inches
Content of mica flakes: Few or common
Content and size of rock fragments: 35 to 60 percent, by volume, in the A and B horizons and 35 to 80 percent in the C horizon; amount typically increases as depth increases; ranging from channers to boulders

Soil reaction: Extremely acid to moderately acid throughout the profile, except where surface layers have been limed

A horizon:
Color—hue of 7.5YR or 10YR, value of 2 to 5, and chroma of 2 to 4; where value is 3 or less, horizon is less than 7 inches thick
Texture (fine-earth fraction)—loam, fine sandy loam, or sandy loam

BA or AB horizon (if it occurs):
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 6
Texture (fine-earth fraction)—loam, fine sandy loam, or sandy loam

Bw horizon:
Color—horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 8 or may be mixed or mottled in shades of these colors
Texture (fine-earth fraction)—loam, fine sandy loam, or sandy loam

BC horizon (if it occurs):
Color—horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 8 or may be mixed or mottled in shades of these colors
Texture (fine-earth fraction)—loam or fine sandy loam

C horizon (if it occurs):
Color—horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 8 or may be mixed or mottled in shades of these colors
Texture (fine-earth fraction)—sandy loam, fine sandy loam, or loamy sand colluvium

Pullback Series

Depth class: Shallow
Drainage class: Well drained
Depth to seasonal high water table: More than 6.0 feet
Permeability: Moderately rapid
Parent material: Residuum affected by soil creep in the upper solum, weathered from low-grade metasedimentary rock, such as metagraywacke
Landscape: High mountains in the western part of the county
Landform: Ridges and mountain slopes
Landform position: Summits and side slopes
Slope range: 8 to 95 percent
Taxonomic classification: Loamy, isotic, frigid Humic Lithic Dystrudepts

Typical Pedon

Pullback sandy loam in an area of Breakneck-Pullback complex, 15 to 30 percent slopes, windswept, very rocky (fig. 50); in Swain County, North Carolina (Great Smoky Mountains National Park); about 9.5 miles northwest of Bryson City and 150 feet north of Clingmans Dome parking area; USGS Clingmans Dome topographic quadrangle; lat. 35 degrees 33 minutes 24 seconds N. and long. 83 degrees 29 minutes 44 seconds W. (A representative map unit for Graham County is on USGS Big Junction topographic quadrangle; lat. 35 degrees 19 minutes 17 seconds N. and long. 83 degrees 59 minutes 38 seconds W.)

Oe—0 to 1 inch; moderately decomposed organic litter and root mat; abrupt smooth boundary.
A—1 to 8 inches; very dark brown (10YR 2/2) sandy loam; moderate fine and medium granular structure; very friable; common very fine and fine and many medium to

Figure 50.—Typical profile of Pullback sandy loam. Pullback soils are shallow to unweathered, hard bedrock and have thick, dark surface layers. They occur on high mountains in the western and southern parts of the county. (Scale is in inches.)

very coarse roots; 5 percent, by volume, metasandstone channers; extremely acid; abrupt wavy boundary.

Bw—8 to 16 inches; dark yellowish brown (10YR 4/4) sandy loam; weak medium and coarse subangular blocky structure; friable; common fine roots; 5 percent, by volume, metasandstone channers; very strongly acid; clear smooth boundary.

R—16 to 80 inches; unweathered, hard metasandstone.

Range in Characteristics

Solum thickness: 14 to 19 inches
Depth to bedrock: 15 to 20 inches to hard bedrock
Content of mica flakes: None or few
Content and size of rock fragments: Less than 30 percent, by volume; dominantly channers or flagstones but including gravel, cobbles, and stones
Soil reaction: Extremely acid to strongly acid

A horizon:
Color—hue of 10YR, value of 2 or 3, and chroma of 1 to 3
Thickness—7 to 12 inches
Texture (fine-earth fraction)—sandy loam, loam, or clay loam

Bw horizon:
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 8
Texture (fine-earth fraction)—loam, sandy loam, or fine sandy loam

BC horizon (if it occurs):
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 8
Texture (fine-earth fraction)—loam, sandy loam, or fine sandy loam

C horizon (if it occurs):
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 8
Texture (fine-earth fraction)—loam, sandy loam, or fine sandy loam

Cr layer (if it occurs):
Type of bedrock—weathered, weakly cemented to strongly cemented, low-grade metasandstone rock with moderate or high excavation difficulty
Other characteristics—few fine and medium roots in cracks that are spaced more than 4 inches apart

R layer:
Type of bedrock—unweathered, hard, metasandstone rock with very high or extremely high excavation difficulty

Reddies Series

Depth class: Very deep
Drainage class: Moderately well drained
Depth to seasonal high water table: 2.0 to 3.5 feet from December through May and 2.5 to 4.0 feet from June through November
Permeability: Moderately rapid in the A and B horizons and rapid or very rapid in the C horizons
Parent material: Recent alluvium that is coarse-loamy in the upper part and sandy or sandy-skeletal in the lower part, derived from materials weathered from low-grade metasedimentary rock
Landscape: Valleys of low and intermediate mountains and intermountain hills throughout the county
Landform: Flood plains
Landform position: Planar to slightly convex bottomland slopes
Slope range: 0 to 5 percent
Taxonomic classification: Coarse-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Oxyaquic Humudepts

Typical Pedon

Reddies fine sandy loam, 0 to 3 percent slopes, occasionally flooded; in Graham County; from Robbinsville, about 1.75 miles east on N.C. Highway 143, about 0.25 mile east on Secondary Road 1212, about 250 feet southwest in a field; USGS Robbinsville topographic quadrangle; lat. 35 degrees 19 minutes 28 seconds N. and long. 83 degrees 46 minutes 23 seconds W.

Ap—0 to 12 inches; dark brown (10YR 3/3) fine sandy loam; weak medium granular structure; very friable; many very fine and fine roots; few fine flakes of mica; 3 percent, by volume, gravel; very strongly acid; clear smooth boundary.
Bw1—12 to 22 inches; yellowish brown (10YR 5/6) loam; weak fine subangular blocky structure; friable; few fine flakes of mica; 3 percent, by volume, gravel; strongly acid; gradual wavy boundary.
Bw2—22 to 27 inches; yellowish brown (10YR 5/6) fine sandy loam; weak fine subangular blocky structure; friable; few fine distinct grayish brown (10YR 5/2) iron depletions; few medium flakes of mica; 3 percent, by volume, gravel; strongly acid; gradual wavy boundary.
C—27 to 31 inches; yellowish brown (10YR 5/6) loamy sand; massive; loose; few medium flakes of mica; 15 percent, by volume, gravel; strongly acid; gradual wavy boundary.
2C—31 to 80 inches; multicolored very cobbly loamy sand; massive; loose; few medium flakes of mica; 15 percent, by volume, gravel, 35 percent cobbles, and 5 percent stones; strongly acid.

Range in Characteristics

Solum thickness: 20 to 39 inches
Depth to contrasting material: 20 to 40 inches to deposits of cobbles and gravel that are stratified with sandy or loamy material
Depth to bedrock: More than 60 inches
Content of mica flakes: Few or common
Content and size of rock fragments: Less than 35 percent, by volume, in the A and B horizons and more than 35 percent in the C horizon; dominantly well rounded gravel or cobbles but including stones
Soil reaction: Very strongly acid to neutral throughout the profile, except where surface layers have been limed

A or Ap horizon:
Color—hue of 7.5YR or 10YR and value and chroma of 2 or 3
Thickness—10 to 20 inches
Texture (fine-earth fraction)—sandy loam, fine sandy loam, or loam

Bw horizon:
Color—hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 8; in some pedons, mottles with chroma of 2 or less occur below a depth of 20 inches
Texture (fine-earth fraction)—fine sandy loam, sandy loam, or loam

C or 2C horizon:
Color—horizon has hue of 7.5YR to 2.5Y, value of 2 to 6, and chroma of 2 to 8 or is variegated in shades of these colors
Texture (fine-earth fraction)—sand, loamy sand, or loamy fine sand alluvium
Redoximorphic features—iron or clay depletions in shades of brown, yellow, olive, or gray; iron accumulations in shades of red, brown, yellow, or olive

Santeetlah Series

Depth class: Very deep
Drainage class: Well drained
Depth to seasonal high water table: More than 6.0 feet
Permeability: Moderately rapid
Parent material: Colluvium derived from low-grade metasedimentary rock
Landscape: Low and intermediate mountains throughout the county
Landform: Coves, colluvial fans, drainageways, and benches
Landform position: Head slopes, footslopes, and toeslopes
Slope range: 30 to 95 percent
Taxonomic classification: Fine-loamy, isotic, mesic Typic Humudepts

Typical Pedon

Santeetlah loam in an area of Spivey-Santeetlah complex, 15 to 30 percent slopes, stony; in Clay County, North Carolina; about 8 miles east of Andrews, 0.2 mile south from Tuni Gap on U.S. Forest Service Road 440, west on U.S. Forest Service Road 6190 to Big Tuni Creek, 300 feet west on a hiking trail, 50 feet south of the hiking trail, in woods; USGS Topton topographic quadrangle; lat. 35 degrees 8 minutes 55 seconds N. and long. 83 degrees 42 minutes 19 seconds W. (A representative map unit for Graham County is on USGS Robbinsville topographic quadrangle; lat. 35 degrees 15 minutes 43 seconds N. and long. 83 degrees 49 minutes 59 seconds W.)

Oe—0 to 2 inches; moderately decomposed organic litter and root mat; abrupt smooth boundary.

A1—2 to 6 inches; very dark brown (10YR 2/2) loam; moderate fine and medium granular structure; very friable; many fine to coarse roots; common fine flakes of mica; 10 percent, by volume, channers; very strongly acid; clear wavy boundary.
A2—6 to 17 inches; dark brown (10YR 3/3) loam; moderate medium granular structure; very friable; common fine to coarse roots; common fine flakes of mica; 10 percent, by volume, channers; strongly acid; clear wavy boundary.
Bw—17 to 39 inches; dark yellowish brown (10YR 4/4) loam; weak medium subangular blocky structure; very friable; common medium and coarse roots; common fine flakes of mica; 10 percent, by volume, channers; strongly acid; gradual wavy boundary.
C1—39 to 49 inches; dark yellowish brown (10YR 4/6) channery loam; massive; very friable; common fine flakes of mica; 25 percent, by volume, channers; very strongly acid; gradual wavy boundary.
C2—49 to 80 inches; mottled dark yellowish brown (10YR 4/6), dark brown (10YR 3/3), and yellowish brown (10YR 5/6) very channery loam; massive; very friable; common fine flakes of mica; 25 percent, by volume, channers and 15 percent flagstones; very strongly acid.

Range in Characteristics

Solum thickness: 30 to more than 60 inches
Depth to bedrock: More than 60 inches
Content of mica flakes: Few or common
Content and size of rock fragments: Less than 35 percent, by volume, to a depth of 40 inches and less than 60 percent below a depth of 40 inches; ranging from channers to boulders; size and number of coarse fragments generally increase as depth increases
Soil reaction: Very strongly acid to moderately acid throughout the profile, except where surface layers have been limed

A horizon:
Color—hue of 7.5YR to 10YR, value of 2 or 3, and chroma of 1 to 3
Combined thickness of A horizons—10 to 20 inches
Texture (fine-earth fraction)—fine sandy loam, silt loam, or loam

Bw horizon:
Color—hue of 7.5YR to 10YR, value of 4 to 6, and chroma of 4 to 8
Texture (fine-earth fraction)—fine sandy loam, silt loam, or loam

BC horizon (if it occurs):
Color—hue of 7.5YR to 10YR, value of 4 to 6, and chroma of 4 to 8
Texture (fine-earth fraction)—fine sandy loam, silt loam, or loam

C horizon:
Color—horizon has hue of 7.5YR to 10YR, value of 4 to 6, and chroma of 4 to 8 or is variegated in shades of these colors
Texture (fine-earth fraction)—loamy sand, sandy loam, fine sandy loam, or loam colluvium

Snowbird Series

Depth class: Deep
Drainage class: Well drained
Depth to seasonal high water table: More than 6.0 feet
Permeability: Moderate
Parent material: Residuum affected by soil creep in the upper solum, weathered from low-grade metasedimentary rock, such as metagraywacke and metasandstone

Landscape: Low mountains and intermountain hills throughout the county
Landform: North- to east-facing ridges and mountain slopes and those slopes shaded by the higher mountains
Landform position: Side slopes
Slope range: 30 to 95 percent
Taxonomic classification: Fine-loamy, mixed, active, mesic Humic Hapludults

Typical Pedon

Snowbird loam, 30 to 50 percent slopes, stony; in Graham County; about 4 miles northwest of Robbinsville, 1.5 miles north on U.S. Highway 129, left on Secondary Road 1116 for 2.5 miles, right on Secondary Road 1127 for 3 miles, across Santeetlah Lake and immediately right on U.S. Forest Service Road 2369, go 1 mile and turn right on a gated USFS road, go 0.5 mile, on the left side of the road, 400 feet upslope from the road on a mountain side slope; USGS Santeetlah Creek topographic quadrangle; lat. 35 degrees 20 minutes 37 seconds N. and long. 83 degrees 52 minutes 31 seconds W.

Oi—0 to 1 inch; slightly decomposed organic litter and root mat; abrupt smooth boundary.
Oe—1 to 3 inches; moderately decomposed organic litter and root mat; abrupt smooth boundary.
A1—3 to 8 inches; dark brown (7.5YR 3/2) loam; strong fine to coarse granular structure; very friable; many very fine to medium, common coarse, and few very coarse roots throughout; many very fine and fine dendritic tubular pores; common very fine and fine mica flakes throughout; very strongly acid; clear smooth boundary.
A2—8 to 10 inches; dark brown (7.5YR 3/3) loam; strong fine to coarse granular structure; very friable; many very fine to medium, common coarse, and few very coarse roots throughout; many very fine and fine dendritic tubular pores; common very fine and fine mica flakes throughout; very strongly acid; clear smooth boundary.
Bt1—10 to 13 inches; dark brown (7.5YR 3/4) loam; strong fine to coarse granular structure; friable; common very fine to medium roots throughout; many very fine and fine dendritic tubular pores; few distinct clay films on the surface of peds and in pores; common very fine and fine mica flakes throughout; very strongly acid; abrupt smooth boundary.
Bt2—13 to 22 inches; brown (7.5YR 4/4) sandy clay loam; moderate fine to very coarse subangular blocky structure; friable; slightly sticky, slightly plastic; common very fine to medium roots between peds; few very fine to very coarse dendritic tubular pores; many distinct clay films on the surface of peds and in pores; many very fine and fine mica flakes throughout; strongly acid; clear wavy boundary.
Bt3—22 to 34 inches; strong brown (7.5YR 4/6) very fine sandy loam; moderate fine to very coarse subangular blocky structure; friable; slightly sticky, slightly plastic; few very fine to medium roots between peds; few very fine to very coarse dendritic tubular pores; common faint clay films on the surface of peds and in pores; many very fine and fine mica flakes throughout; 10 percent, by volume, channers; strongly acid; clear wavy boundary.
BC—34 to 57 inches; dark yellowish brown (10YR 4/4) channery very fine sandy loam; weak fine to coarse subangular blocky structure; friable; few fine and medium roots throughout; few very fine to medium dendritic tubular pores; many very fine and fine mica flakes throughout; 15 percent, by volume, channers and 5 percent flagstones; strongly acid; abrupt irregular boundary.
Cr—57 to 80 inches; weathered, moderately cemented interbedded metasandstone and phyllite; high excavation difficulty; few fine and medium roots in cracks that are spaced more than 4 inches apart; strongly acid.

Range in Characteristics

Solum thickness: 26 to 55 inches
Depth to bedrock: 40 to 60 inches to soft bedrock
Content of mica flakes: Few or common in the A horizon and upper Bt horizons and few to many in the lower Bt horizons and in the BC horizon
Content and size of rock fragments: Less than 15 percent, by volume, in the A and Bt horizons and less than 30 percent in the BC and C horizons; ranging from channers to flagstones
Soil reaction: Extremely acid to strongly acid throughout the profile

A horizon:
Color—hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 2 to 4
Combined thickness of A horizons—7 to 14 inches
Texture (fine-earth fraction)—loam, sandy loam, or fine sandy loam

AB horizon (if it occurs):
Color—hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 6
Texture (fine-earth fraction)—loam or sandy clay loam

Bt horizon:
Color—hue of 5YR, 7.5YR, or 10YR, value of 3 to 5, and chroma of 4 to 8
Texture (fine-earth fraction)—loam, fine sandy loam, sandy clay loam, or clay loam

BC horizon:
Color—hue of 10YR, 7.5YR, or 5YR, value of 4 or 5, and chroma of 4 to 8
Texture (fine-earth fraction)—loam, sandy clay loam, fine sandy loam, or sandy loam

C horizon (if it occurs):
Color—hue of 10YR, 7.5YR, or 5YR, value of 4 or 5, and chroma of 4 to 8
Texture (fine-earth fraction)—loam, fine sandy loam, or sandy loam

Cr layer:
Type of bedrock—weathered, weakly cemented to strongly cemented, low-grade metasedimentary rock with moderate or high excavation difficulty
Other characteristics—few fine and medium roots in cracks that are spaced more than 4 inches apart

Soco Series

Depth class: Moderately deep
Drainage class: Well drained
Depth to seasonal high water table: More than 6.0 feet
Permeability: Moderately rapid
Parent material: Residuum affected by soil creep in the upper solum, weathered from low-grade metasedimentary rock, such as metagraywacke and metasandstone
Landscape: Intermediate mountains throughout the county
Landform: Ridges and south- to west-facing mountain slopes
Landform position: Summits and side slopes
Slope range: 15 to 95 percent
Taxonomic classification: Coarse-loamy, mixed, active, mesic Typic Dystrudepts

Typical Pedon

Soco channery loam in an area of Soco-Stecoah complex, 30 to 50 percent slopes; in Clay County, North Carolina; about 8 miles southeast of Andrews, 0.2 mile south of Tuni Gap on U.S. Forest Service Road 440, about 1.7 miles west on U.S. Forest Service Road 6190 to a ridge between Big Tuni Creek and Chestnut Branch, 100 feet north of U.S. Forest Service Road 6190 in woods; USGS Topton topographic quadrangle; lat. 35 degrees 8 minutes 48 seconds N. and long. 83 degrees 42 minutes 13 seconds W. (A representative map unit for Graham County is on USGS Santeetlah topographic quadrangle; lat. 35 degrees 20 minutes 23 seconds N. and long. 83 degrees 55 minutes 7 seconds W.)

Oe—0 to 1 inch; moderately decomposed organic litter and root mat; abrupt smooth boundary.

A—1 to 3 inches; dark yellowish brown (10YR 3/4) channery loam; weak fine and medium granular structure; very friable; many fine to coarse roots; few fine flakes of mica; 15 percent, by volume, channers and 5 percent flagstones; extremely acid; clear smooth boundary.

Bw—3 to 23 inches; brownish yellow (10YR 6/8) channery sandy loam; weak fine and medium subangular blocky structure; very friable; common fine to coarse roots; few fine flakes of mica; 15 percent, by volume, channers and 5 percent flagstones; very strongly acid; gradual irregular boundary.

Cr—23 to 80 inches; weathered, moderately cemented interbedded metasandstone and phyllite; high excavation difficulty; few fine and medium roots in cracks that are spaced more than 4 inches apart.

Range in Characteristics

Solum thickness: 15 to 39 inches
Depth to bedrock: 20 to 40 inches to weathered bedrock
Content of mica flakes: Few or common
Content and size of rock fragments: Less than 30 percent, by volume; dominantly channers or flagstones but including gravel, cobbles, and stones
Soil reaction: Extremely acid to strongly acid throughout the profile

A horizon:
Color—hue of 7.5YR to 2.5Y, value of 2 to 5, and chroma of 1 to 6; where value is 3 or less, horizon is less than 7 inches thick
Texture (fine-earth fraction)—fine sandy loam, silt loam, or loam

BA or AB horizon (if it occurs):
Color—hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 8
Texture (fine-earth fraction)—fine sandy loam, sandy loam, very fine sandy loam, silt loam, or loam

Bw horizon:
Color—hue of 5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 8
Texture (fine-earth fraction)—fine sandy loam, sandy loam, very fine sandy loam, silt loam, or loam

BC horizon (if it occurs) :
Color—hue of 5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 8
Texture (fine-earth fraction)—fine sandy loam, sandy loam, very fine sandy loam, silt loam, or loam

C horizon (if it occurs):
Color—horizon has hue of 5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 8 or may be mixed or mottled in shades of these colors
Texture (fine-earth fraction)—loamy sand, loamy fine sand, sandy loam, fine sandy loam, or loam saprolite

Cr layer:
Type of bedrock—weathered, weakly cemented to strongly cemented, low-grade metasedimentary rock with moderate or high excavation difficulty

Other characteristics—few fine and medium roots in cracks that are spaced more than 4 inches apart

Spivey Series

Depth class: Very deep
Drainage class: Well drained
Depth to seasonal high water table: More than 6.0 feet
Permeability: Moderately rapid
Parent material: Colluvium derived from low-grade metasedimentary rock
Landscape: Low and intermediate mountains throughout the county
Landform: Coves, colluvial fans, drainageways, and benches
Landform position: Head slopes, footslopes, and toeslopes
Slope range: 8 to 95 percent
Taxonomic classification: Loamy-skeletal, isotic, mesic Typic Humudepts

Typical Pedon

Spivey very flaggy loam in an area of Spivey-Whiteoak complex, 15 to 30 percent slopes, bouldery; in Graham County; about 4 miles south of Robbinsville, 1.60 miles north of Tatham Gap on U.S. Forest Service Road 423, about 50 feet west of U.S. Forest Service Road 423, in woods; USGS Robbinsville topographic quadrangle; lat. 35 degrees 15 minutes 56 seconds N. and long. 83 degrees 49 minutes 12 seconds W.

Oe—0 to 1 inch; moderately decomposed organic litter and root mat; abrupt smooth boundary.

A1—1 to 7 inches; very dark grayish brown (10YR 3/2) very flaggy loam; moderate fine and medium granular structure; very friable; many fine, medium, and common coarse roots; few fine flakes of mica; 20 percent, by volume, channers, 20 percent flagstones, and 5 percent stones; very strongly acid; clear wavy boundary.

A2—7 to 12 inches; dark brown (10YR 3/3) very flaggy loam; moderate fine and medium granular structure; very friable; common fine to coarse roots; few fine flakes of mica; 20 percent, by volume, channers, 20 percent flagstones, and 5 percent stones; very strongly acid; gradual wavy boundary.

Bw1—12 to 30 inches; brown (10YR 4/3) very stony loam; weak medium subangular blocky structure; friable; common fine and few medium and coarse roots; few fine flakes of mica; 15 percent, by volume, channers, 20 percent flagstones, and 20 percent stones; strongly acid; clear wavy boundary.

Bw2—30 to 80 inches; yellowish brown (10YR 5/4) extremely stony sandy loam; weak medium subangular blocky structure; very friable; few medium and coarse roots; few fine flakes of mica; 15 percent, by volume, channers, 20 percent flagstones, and 25 percent stones; strongly acid.

Range in Characteristics

Solum thickness: 35 to more than 60 inches
Depth to bedrock: More than 60 inches
Content of mica flakes: Few or common
Content and size of rock fragments: 35 to 60 percent, by volume, in the A and B horizons and 35 to 80 percent in the C horizon; amount typically increases as depth increases; ranging from channers to boulders
Soil reaction: Extremely acid to moderately acid throughout the profile, except where surface layers have been limed

A horizon:
Color—hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 to 3
Combined thickness of A horizons—10 to 20 inches
Texture (fine-earth fraction)—loam, fine sandy loam, silt loam, or sandy loam

Bw horizon:
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 8
Texture (fine-earth fraction)—loam, fine sandy loam, silt loam, or sandy loam

BC horizon (if it occurs):
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 8
Texture (fine-earth fraction)—loam, sandy loam, silt loam, or loamy sand colluvium

C horizon (if it occurs):
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 8
Texture (fine-earth fraction)—loam, sandy loam, silt loam, or loamy sand colluvium

Statler Series

Depth class: Very deep
Drainage class: Well drained
Depth to seasonal high water table: 4.0 to 6.0 feet from January through December
Permeability: Moderate
Parent material: Loamy alluvium and colluvium derived from materials weathered from low-grade metasedimentary rock
Landscape: Valleys of low and intermediate mountains and intermountain hills throughout the county
Landform: Low stream terraces
Landform position: Concave to planar toeslopes
Slope range: 2 to 8 percent
Taxonomic classification: Fine-loamy, mixed, active, mesic Humic Hapludults

Typical Pedon

Statler loam, 1 to 5 percent slopes, rarely flooded; in Cherokee County, North Carolina (fig. 51); 5 miles southeast of Murphy on U.S. Highway 64, about 1,345 feet east of Secondary Road 1531 on U.S. Highway 64, about 1,375 feet southwest of U.S. Highway 64, in a field; USGS Peachtree topographic quadrangle; lat. 35 degrees 4 minutes 28 seconds N. and long. 83 degrees 58 minutes 29 seconds W. (A representative map unit for Graham County is on USGS Robbinsville topographic quadrangle; lat. 35 degrees 20 minutes 29 seconds N. and long. 83 degrees 47 minutes 59 seconds W.)

Ap—0 to 8 inches; dark brown (10YR 3/3) loam; moderate medium granular structure; very friable; many fine roots; few fine flakes of mica; slightly acid; abrupt smooth boundary.
Bt1—8 to 25 inches; strong brown (7.5YR 4/6) clay loam; weak medium subangular blocky structure; friable; few fine roots; few discontinuous clay films on faces of peds; few fine flakes of mica; moderately acid; gradual wavy boundary.
Bt2—25 to 55 inches; yellowish brown (10YR 5/6) loam; weak medium subangular blocky structure; friable; few fine roots; few discontinuous clay films on faces of peds; common fine flakes of mica; moderately acid; gradual wavy boundary.
C—55 to 80 inches; yellowish brown (10YR 5/6) fine sandy loam; few fine distinct yellowish red (5YR 5/8) mottles; massive; very friable; common fine flakes of mica; moderately acid.

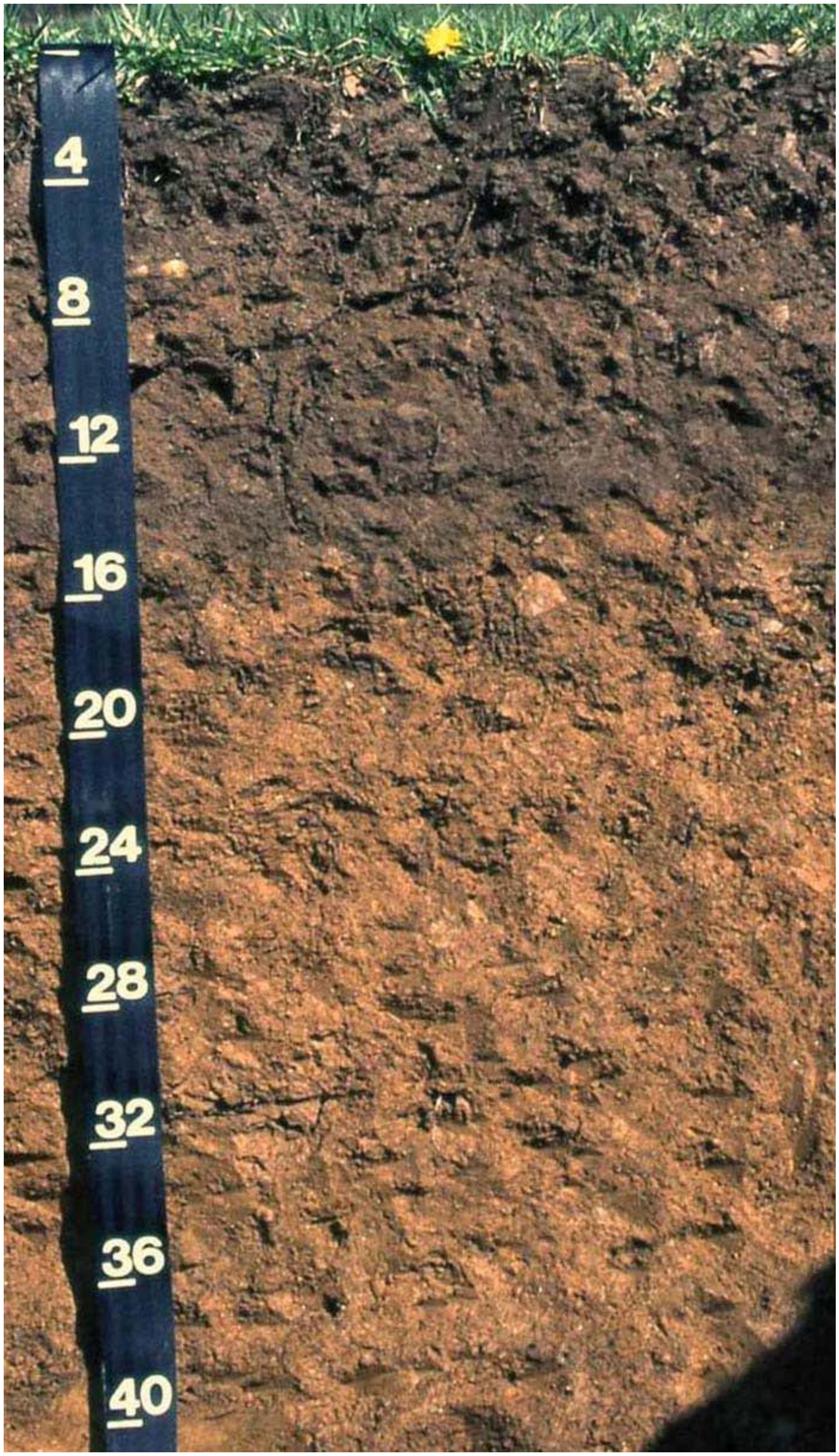


Figure 51.—Typical profile of Statler loam. Statler soils are very deep, have dark surface layers, formed from old alluvium, and consist of fine-loamy material. They occur in mountain valleys of low and intermediate mountains throughout the county. (Scale is in inches.)

Range in Characteristics

Solum thickness: 30 to more than 60 inches
Depth to bedrock: More than 60 inches
Content of mica flakes: Few or common
Content and size of rock fragments: Less than 15 percent, by volume, in the A or Ap horizon and in the Bt horizons and less than 35 percent in the C horizon; dominantly well rounded gravel but including cobbles and stones in some areas
Soil reaction: Strongly acid to neutral in the A horizon, except where surface layers have been limed; strongly acid to slightly acid in the upper B horizons; and strongly acid to moderately acid in the BC and C horizons

Ap horizon:
Color—hue of 7.5YR or 10YR, value of 2 to 3, and chroma of 2 to 4
Thickness of A horizon—7 to 10 inches
Texture (fine-earth fraction)—loam, silt loam, or fine sandy loam

Bt horizon:
Color—hue of 10YR to 5YR, value of 4 to 6, and chroma of 3 to 8
Texture (fine-earth fraction)—clay loam, loam, silt loam, silty clay loam, or sandy clay loam

BC horizon (if it occurs):
Color—hue of 10YR to 5YR, value of 4 to 6, and chroma of 3 to 8
Texture (fine-earth fraction)—loam, fine sandy loam, silt loam, silty clay loam, or clay loam alluvium

C horizon:
Color—hue of 10YR to 5Y, value of 4 to 6, and chroma of 3 to 8
Texture (fine-earth fraction)—loam, fine sandy loam, silt loam, silty clay loam, or clay loam alluvium
Redoximorphic features (if they occur)—iron or clay depletions in shades of brown, yellow, or gray; iron accumulations in shades of brown or yellow

Stecoah Series

Depth class: Deep
Drainage class: Well drained
Depth to seasonal high water table: More than 6.0 feet
Permeability: Moderately rapid
Parent material: Residuum affected by soil creep in the upper solum, weathered from low-grade metasedimentary rock, such as metagraywacke and metasandstone
Landscape: Intermediate mountains throughout the county
Landform: Ridges and south- to west-facing mountain slopes
Landform position: Summits and side slopes
Slope range: 15 to 95 percent
Taxonomic classification: Coarse-loamy, mixed, active, mesic Typic Dystrudepts

Typical Pedon

Stecoah channery loam in an area of Soco-Stecoah complex, 50 to 95 percent slopes, stony; in Graham County; about 5.6 miles northeast of Robbinsville, 7.6 miles east of the intersection of U.S. Highway 129 and N.C. Highway 143 on N.C. Highway 143, about 150 feet east of N.C. Highway 143, in woods; USGS Hewitt topographic quadrangle; lat. 35 degrees 21 minutes 34 seconds N. and long. 83 degrees 43 minutes 12 seconds W.

Oe—0 to 1 inch; moderately decomposed organic litter and root mat; abrupt smooth boundary.

A—1 to 6 inches; dark brown (10YR 3/3) channery loam, brown (10YR 5/3) dry; weak medium granular structure; very friable; common fine, medium, and coarse roots; common fine flakes of mica; 4 percent, by volume, flagstones that are mostly metasandstone and 16 percent phyllite channers; strongly acid; clear wavy boundary.

Bw1—6 to 13 inches; dark yellowish brown (10YR 4/6) channery loam; weak fine subangular blocky structure; friable; common fine, medium, and coarse roots; common fine flakes of mica; 2 percent, by volume, flagstones that are mostly metasandstone and 16 percent phyllite channers; very strongly acid; gradual wavy boundary.

Bw2—13 to 37 inches; yellowish brown (10YR 5/6) channery loam; weak fine subangular blocky structure; friable; few coarse roots; common fine flakes of mica; 9 percent, by volume, flagstones that are mostly metasandstone and 16 percent phyllite channers; strongly acid; gradual wavy boundary.

C—37 to 49 inches; yellowish brown (10YR 5/6), light brownish gray (10YR 6/2), strong brown (7.5YR 5/6), and dark brown (7.5YR 3/2) channery loam; massive; friable; common fine flakes of mica; 5 percent, by volume, flagstones that are mostly metasandstone and 25 percent phyllite channers; strongly acid; gradual irregular boundary.

Cr—49 to 80 inches; weathered, moderately cemented interbedded metasandstone and phyllite; high excavation difficulty; few fine and medium roots in cracks that are spaced more than 4 inches apart.

Range in Characteristics

Solum thickness: 24 to 50 inches
Depth to bedrock: 40 to 60 inches to weathered bedrock
Content of mica flakes: Few or common
Content and size of rock fragments: Less than 30 percent, by volume; dominantly channers or flagstones but including gravel, cobbles, and stones
Soil reaction: Extremely acid to strongly acid throughout the profile

A horizon:
Color—hue of 7.5YR to 2.5Y, value of 2 to 5, and chroma of 1 to 6; where value is 3 or less, horizon is less than 7 inches thick
Texture (fine-earth fraction)—fine sandy loam, silt loam, or loam

Bw horizon:
Color—hue of 5YR or 2.5Y, value of 4 to 6, and chroma of 3 to 8
Texture (fine-earth fraction)—sandy loam, fine sandy loam, silt loam, or loam

BC horizon (if it occurs):
Color—horizon has hue of 5YR or 2.5Y, value of 4 to 6, and chroma of 3 to 8 or is mixed or mottled in shades of these colors; colors with chroma of 2 or less are inherited from the parent material and are not caused by wetness
Texture (fine-earth fraction)—sandy loam, fine sandy loam, silt loam, or loam; pockets of loamy sand or sandy loam saprolite occur in some pedons

C horizon:
Color—horizon has hue of 5YR or 2.5Y, value of 4 to 6, and chroma of 3 to 8 or is variegated in shades of these colors; colors with chroma of 2 or less are inherited from the parent material and are not caused by wetness
Texture (fine-earth fraction)—loam, sandy loam, fine sandy loam, loamy fine sand, silt loam, or loamy sand saprolite

Cr layer:

Type of bedrock—weathered, weakly cemented to strongly cemented, low-grade metasedimentary rock with moderate or high excavation difficulty

Other characteristics—few fine and medium roots in cracks that are spaced more than 4 inches apart

Sylco Series

Depth class: Moderately deep
Drainage class: Somewhat excessively drained
Depth to seasonal high water table: More than 6.0 feet
Permeability: Moderately rapid
Parent material: Residuum affected by soil creep in the upper solum, weathered from low-grade metasedimentary rock, such as slate
Landscape: Low and intermediate mountains in the northwestern, north-central, and southeastern parts of the county
Landform: Ridges and south- to west-facing mountain slopes
Landform position: Summits and side slopes
Slope range: 15 to 95 percent
Taxonomic classification: Loamy-skeletal, mixed, active, mesic Typic Dystrudepts

Typical Pedon

Sylco very channery loam in an area of Sylco-Cataska complex, 30 to 50 percent slopes, very rocky (fig. 52); in Cherokee County, North Carolina; about 16 miles northwest of Murphy, 150 feet northeast of Secondary Road 1326 at Unicoi Gap; USGS Farner topographic quadrangle; lat. 35 degrees 13 minutes 27 seconds N. and long. 84 degrees 17 minutes 23 seconds W. (A representative map unit for Graham County is on USGS Hewitt topographic quadrangle; lat. 35 degrees 21 minutes 40 seconds N. and long. 83 degrees 39 minutes 24 seconds W.)

Oe—0 to 1 inch; moderately decomposed organic litter and root mat; abrupt smooth boundary.

A—1 to 6 inches; dark yellowish brown (10YR 3/4) very channery loam; weak moderate to coarse granular structure; very friable; many medium to coarse roots; 30 percent, by volume, channers and 8 percent flagstones; very strongly acid; clear smooth boundary.

Bw1—6 to 19 inches; strong brown (7.5YR 4/6) very channery loam; weak fine and medium subangular blocky structure; very friable; common medium and coarse roots; 25 percent, by volume, channers and 15 percent flagstones; strongly acid; gradual wavy boundary.

Bw2—19 to 29 inches; dark yellowish brown (10YR 4/4) very channery loam; weak fine and medium subangular blocky structure; very friable; common medium and coarse roots; 25 percent, by volume, channers and 20 percent flagstones; strongly acid; clear wavy boundary.

Cr—29 to 36 inches; weathered, moderately cemented slate; high excavation difficulty; few fine and medium thin seams of brown (7.5YR 4/4) loam in cracks; few roots in cracks that are spaced more than 4 inches apart; strongly acid; gradual irregular boundary.

R—36 to 80 inches; unweathered, hard slate.

Range in Characteristics

Solum thickness: 17 to 39 inches
Depth to bedrock: 20 to 40 inches

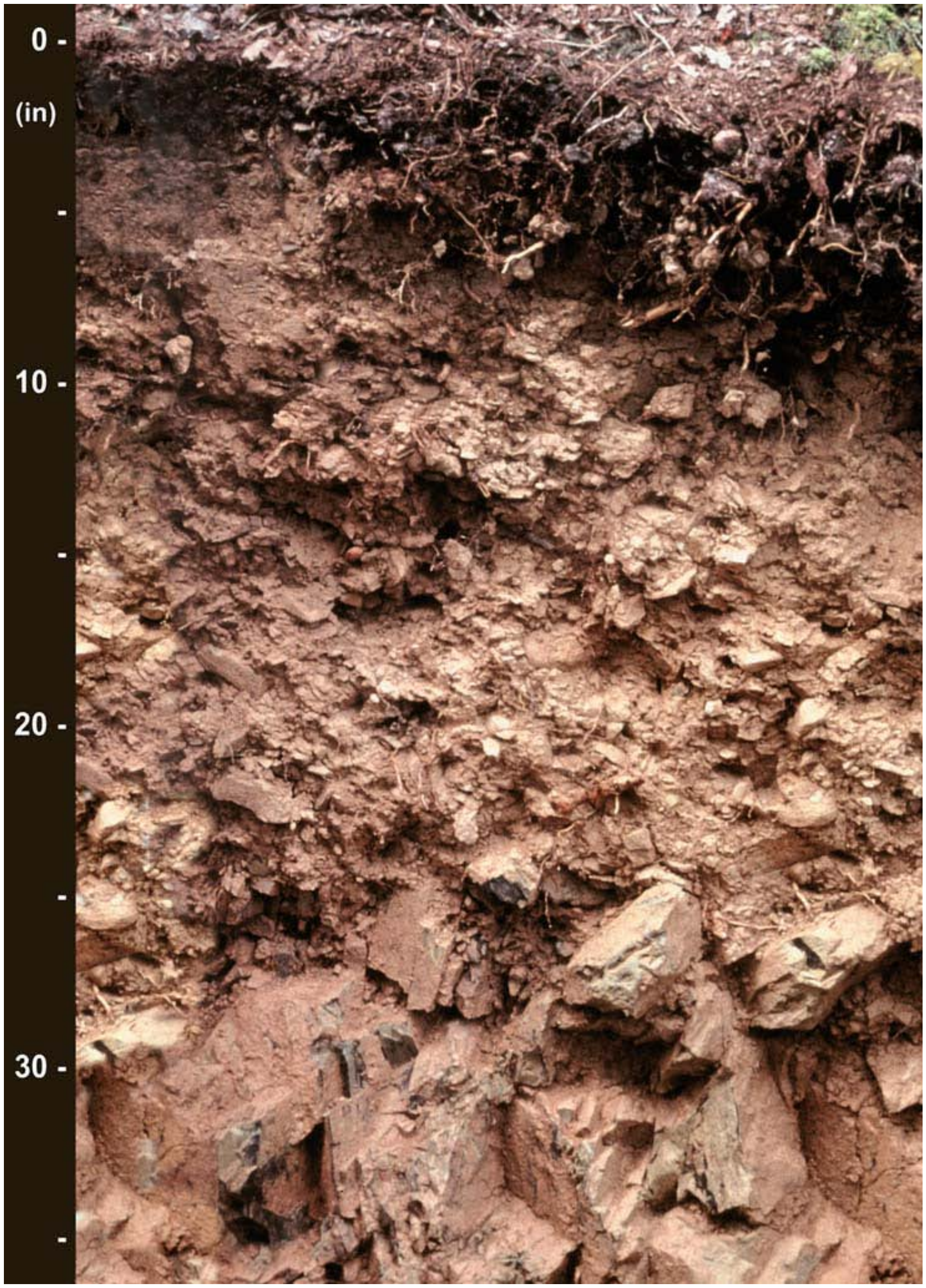


Figure 52.—Typical profile of Sylco very channery loam. Sylco soils are moderately deep to unweathered, fractured, thinly layered bedrock and have many rock fragments in the subsoil. They occur on low or intermediate mountains, dominantly in the eastern one-third and northwestern corner of the county. (Scale is in inches.)

Content of mica flakes: None or few

Content and size of rock fragments: 10 to 50 percent, by volume, in the A horizon, 15 to 45 percent in the B horizon, and 40 to 70 percent or more in the C horizon; the average content of these fragments between a depth of 10 inches and bedrock ranges from 35 to 50 percent; dominantly channers and flagstones

Soil reaction: Extremely acid to strongly acid throughout the profile

A horizon:
Color—hue of 10YR, value of 3 or 4, and chroma of 2 to 4; where value is 3 or less, horizon is less than 7 inches thick
Texture (fine-earth fraction)—loam or silt loam

Bw horizon:
Color—hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 3 to 8
Texture (fine-earth fraction)—loam or silt loam

C horizon (if it occurs):
Color—hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 3 to 8
Texture (fine-earth fraction)—loam or silt loam saprolite

Cr layer:
Type of bedrock—weathered, weakly cemented to strongly cemented, low-grade metasedimentary rock with moderate or high excavation difficulty
Other characteristics—few fine and medium roots in cracks that are spaced more than 4 inches apart

R layer:
Type of bedrock—unweathered, hard, low-grade metasedimentary rock with very high or extremely high excavation difficulty

Thurmont Series

Depth class: Very deep
Drainage class: Well drained
Depth to seasonal high water table: 3.0 to 6.0 feet from December through May and 3.5 to 6.0 feet from June through November
Permeability: Moderate
Parent material: Colluvium and alluvium derived from low-grade metasedimentary rock
Landscape: Valleys of intermountain hills and low mountains throughout the county
Landform: Coves, colluvial fans, and drainageways
Landform position: Coves, colluvial fans, and benches
Slope range: 2 to 8 percent
Taxonomic classification: Fine-loamy, mixed, active, mesic Oxyaquic Hapludults

Typical Pedon

Thurmont loam in an area of Thurmont–Dillard complex, 8 to 15 percent slopes; in Cherokee County, North Carolina; about 5 miles west of Murphy, 2.9 miles northeast from N.C. Highway 294 on Secondary Road 1303, about 2.35 miles northwest on U.S. Forest Service Road 307A, about 1,900 feet southwest of U.S. Forest Service Road 307 in a seed orchard; USGS Persimmon Creek topographic quadrangle; lat. 35 degrees 4 minutes 44 seconds N. and long. 84 degrees 7 minutes 48 seconds W. (A representative map unit for Graham County is on USGS Robbinsville topographic quadrangle; lat. 35 degrees 17 minutes 51 seconds N. and long. 83 degrees 47 minutes 41 seconds W.)

Ap—0 to 4 inches; dark yellowish brown (10YR 4/4) loam; moderate fine granular structure; very friable; many fine to coarse roots; 3 percent, by volume, gravel; few fine flakes of mica; strongly acid; abrupt smooth boundary.
Bt1—4 to 35 inches; strong brown (7.5YR 5/6) clay loam; moderate medium subangular blocky structure; friable; common medium and coarse roots; few discontinuous clay films on faces of peds; few fine flakes of mica; 3 percent, by volume, gravel; strongly acid; clear wavy boundary.
Bt2—35 to 42 inches; brownish yellow (10YR 6/6) sandy clay loam; weak medium subangular blocky structure; friable; common coarse roots; few discontinuous

clay films on faces of peds; few fine flakes of mica; 5 percent, by volume, gravel; strongly acid; gradual wavy boundary.

BC—42 to 48 inches; brownish yellow (10YR 6/6) sandy loam; weak medium subangular blocky structure; friable; few coarse roots; few fine distinct light gray (10YR 7/2) iron depletions; common fine flakes of mica; 7 percent, by volume, gravel; strongly acid; gradual wavy boundary.

C—48 to 80 inches; pale brown (10YR 6/3) loamy sand; massive; very friable; common medium distinct light gray (10YR 7/1) iron depletions and common medium distinct brownish yellow (10YR 6/6) soft masses of iron accumulation; common fine flakes of mica; 10 percent, by volume, gravel; strongly acid.

Range in Characteristics

Solum thickness: 40 to more than 60 inches
Depth to bedrock: More than 60 inches
Content of mica flakes: Few or common
Content and size of rock fragments: Less than 30 percent, by volume, in the A and Bt horizons and less than 60 percent in the BC and C horizons; dominantly rounded gravel or cobbles but including stones
Soil reaction: Very strongly acid to neutral in the A horizon, except where surface layers have been limed, and very strongly acid to moderately acid in the B and C horizons

Ap or A horizon:
Color—hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 2 to 6; where value and chroma are 3 or less, the A horizon is less than 7 inches thick
Texture (fine-earth fraction)—loam, sandy loam, or fine sandy loam

Bt horizon:
Color—hue of 5YR to 10YR, value of 4 to 6, and chroma of 4 to 8
Texture (fine-earth fraction)—loam, sandy clay loam, or clay loam
Redoximorphic features—iron depletions with chroma of 2 or less occur deeper than 24 inches from the upper boundary of the horizon; soft masses of iron accumulation in shades of yellow, brown, or red may also occur

BC horizon:
Color—horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 4 to 8 or is variegated in shades of these colors
Texture (fine-earth fraction)—sandy loam, loam, or sandy clay loam

C horizon:
Color—horizon has hue of 2.5YR to 10YR, value of 2 to 8, and chroma 1 to 7 or is variegated in shades of these colors
Texture (fine-earth fraction)—loamy sand to clay colluvium

Tsali Series

Depth class: Shallow
Drainage class: Well drained
Depth to seasonal high water table: More than 6.0 feet
Permeability: Moderate
Parent material: Residuum affected by soil creep in the upper solum, weathered from low-grade metasedimentary rock, such as phyllite and thinly bedded metasandstone
Landscape: Intermountain hills and low and intermediate mountains, dominantly in the eastern part of the county
Landform: Ridges and south- to west-facing mountain slopes

Landform position: Summits and side slopes
Slope range: 8 to 95 percent
Taxonomic classification: Loamy, mixed, subactive, mesic, shallow Typic Hapludults

Typical Pedon

Tsali channery loam in an area of Junaluska-Tsali complex, 15 to 30 percent slopes; in Graham County; about 14 miles northeast of Robbinsville, 9 miles east of the intersection of N.C. Highways 143 and 28 on N.C. Highway 28, about 1.6 miles north on U.S. Forest Service Road 521 to U.S. Forest Service Road 2550, about 1 mile north and 150 feet east in woods; USGS Noland Creek topographic quadrangle; lat. 35 degrees 24 minutes 49 seconds N. and long. 83 degrees 35 minutes 8 seconds W.

Oe—0 to 1 inch; moderately decomposed organic litter and root mat; abrupt smooth boundary.

A—1 to 8 inches; yellowish brown (10YR 5/6) channery loam, light yellowish brown (10YR 6/4) dry; weak fine granular structure; very friable; common fine and medium roots; few fine flakes of mica; 20 percent, by volume, metasandstone channers; very strongly acid; clear wavy boundary.

Bt1—8 to 14 inches; yellowish red (5YR 5/8) channery loam; few fine distinct reddish brown (5YR 5/3) mottles; weak fine and medium subangular blocky structure; friable; slightly sticky, slightly plastic; few medium and coarse roots; few faint clay films on faces of peds; few fine flakes of mica; 16 percent, by volume, metasandstone channers; very strongly acid; gradual wavy boundary.

Bt2—14 to 19 inches; yellowish red (5YR 5/6) channery clay loam; weak fine and medium subangular blocky structure; friable; slightly sticky, slightly plastic; few coarse roots; few faint clay films on faces of peds; common pockets of dark yellowish brown (10YR 4/4) saprolite that have a sandy loam texture; few fine flakes of mica; 16 percent, by volume, metasandstone channers; extremely acid; clear irregular boundary.

Cr—19 to 80 inches; weathered, moderately cemented metasandstone; high excavation difficulty; few medium thin seams of yellowish red (5YR 5/6) loam in cracks; few fine and medium roots in cracks that are spaced more than 4 inches apart; extremely acid.

Range in Characteristics

Solum thickness: 10 to 20 inches
Depth to bedrock: 10 to 20 inches to weathered bedrock
Content of mica flakes: Few or common
Content and size of rock fragments: Less than 30 percent, by volume; dominantly channers and flagstones
Soil reaction: Extremely acid to moderately acid throughout the profile

A or Ap horizon:
Color—hue of 5YR to 10YR, value of 3 to 5, and chroma of 3 to 8; where value is 3 or less, the A horizon is less than 7 inches thick
Texture (fine-earth fraction)—loam or fine sandy loam

AB or BA horizon (if it occurs):
Color—hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8
Texture (fine-earth fraction)—loam, sandy loam, or fine sandy loam

Bt horizon:
Color—hue of 2.5YR to 10YR, value of 4 to 6, and chroma of 4 to 8; at least part of the horizon has hue of 2.5YR or 5YR
Texture (fine-earth fraction)—clay loam, loam, or sandy clay loam

BC horizon (if it occurs):
Color—hue of 2.5YR to 10YR, value of 4 to 6, and chroma of 4 to 8
Texture (fine-earth fraction)—loam or fine sandy loam

C/B or C horizon (if it occurs):
Color—multicolored in shades of red, brown, yellow, gray, or white
Texture (fine-earth fraction)—fine sandy loam, loam, sandy loam, or loamy fine sand saprolite
Other characteristics—thin parallel layers of saprolite and Bt horizon material may occur along fracture planes

Cr layer:
Type of bedrock—weathered, weakly cemented to strongly cemented, low-grade metasedimentary rock with moderate or high excavation difficulty
Other characterstics—few fine and medium roots in cracks that are spaced more than 4 inches apart

Udorthents

Depth class: Deep and very deep
Drainage class: Somewhat excessively drained to moderately well drained
Depth to seasonal high water table: More than 6.0 feet
Permeability: Very rapid to slow
Parent material: Fill areas—mixture of earthy material and natural soils; excavated areas—variable, depending on the type of underlying bedrock
Landscape: Intermountain hills and low and intermediate mountains throughout the county and high mountains along the Cherohala Skyway in the western part of the county
Landform: Summits, side slopes, coves, terraces, footslopes, toeslopes, and flood plains where the natural soil has been excavated or covered by earthy fill material
Slope range: 0 to 95 percent
Taxonomic classification: Udorthents

Typical Pedon

A typical pedon is not given due to the variable nature of the soil.

Range in Characteristics

Depth to bedrock: Excavated areas—bedrock commonly exposed at or near the soil surface; fill areas—40 to more than 60 inches
Content and size of rock fragments: Variable, commonly 15 to 50 percent; ranging from channers to boulders
Soil reaction: Very strongly acid to moderately acid

Fill areas:
Color—hue of 2.5YR to 5Y, value of 4 to 8, and chroma of 2 to 8
Texture (fine-earth fraction)—variable, commonly loamy

Excavated areas:
Color—hue of 2.5YR to 5Y, value of 4 to 8, and chroma of 2 to 8
Texture (fine-earth fraction)—variable, commonly loamy

Unicoi Series

Depth class: Shallow
Drainage class: Somewhat excessively drained
Depth to seasonal high water table: More than 6.0 feet

Permeability: Moderately rapid
Parent material: Residuum affected by soil creep in the upper solum, weathered from low-grade metasedimentary rock, such as metagraywacke and quartzite
Landscape: Low and intermediate mountains, dominantly in the northwestern, north-central, and southeastern parts of the county
Landform: Ridges and south- to west-facing mountain slopes
Landform position: Summits and side slopes
Slope range: 30 to 95 percent
Taxonomic classification: Loamy-skeletal, mixed, semiactive, mesic Lithic Dystrudepts

Typical Pedon

Unicoi channery loam in an area of Ditney-Unicoi-Rock outcrop complex, 50 to 90 percent slopes, very stony; in Graham County; about 7 miles northwest of Robbinsville, 1.80 miles northeast of U.S. Forest Service Road 416 on Secondary Road 1127, about 270 feet northwest along an old logging road; USGS Tapoco topographic quadrangle; lat. 35 degrees 22 minutes 40 seconds N. and long. 83 degrees 54 minutes 52 seconds W.

A1—0 to 1 inch; dark brown (10YR 3/3) channery loam; moderate fine granular structure; very friable; many fine and few medium roots; 15 percent, by volume, channers; strongly acid; clear smooth boundary.
A2—1 to 4 inches; dark yellowish brown (10YR 4/4) channery fine sandy loam; moderate medium granular structure; very friable; many fine and few medium roots; 15 percent, by volume, channers; strongly acid; gradual smooth boundary.
Bw—4 to 15 inches; dark yellowish brown (10YR 4/6) very flaggy fine sandy loam; weak medium subangular blocky structure parting to moderate medium granular; very friable; common fine roots; 15 percent, by volume, channers and 20 percent flagstones; strongly acid; abrupt wavy boundary.
R—15 to 80 inches; unweathered, hard metagraywacke bedrock.

Range in Characteristics

Solum thickness: 7 to 20 inches
Depth to bedrock: 7 to 20 inches to hard bedrock
Content of mica flakes: None or few
Content and size of rock fragments: 15 to 60 percent, by volume, in the A horizon and 35 to 60 percent in the B and C horizons; dominantly channers or flagstones but including gravel, cobbles, and stones
Soil reaction: Extremely acid to strongly acid throughout the profile

A horizon:
Color—hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 1 to 4; where value is 3 or less, horizon is less than 7 inches thick
Texture (fine-earth fraction)—sandy loam, fine sandy loam, or loam

BA or AB horizon (if it occurs):
Color—hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 or 4
Texture (fine-earth fraction)—sandy loam, fine sandy loam, or loam

Bw horizon:
Color—horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 8 or is variegated in shades of yellow or brown
Texture (fine-earth fraction)—sandy loam, fine sandy loam, or loam

BC horizon (if it occurs):
Color—horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 8 or is variegated in shades of yellow or brown

Thickness—3 to 6 inches
Texture (fine-earth fraction)—sandy loam, fine sandy loam, or loam

C horizon (if it occurs):
Color—horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 8 or is variegated in shades of yellow or brown
Texture (fine-earth fraction)—sandy loam, fine sandy loam, loam, loamy fine sand, or loamy sand saprolite

R layer:
Type of bedrock—unweathered, hard, low-grade metasedimentary rock with very high or extremely high excavation difficulty

Unison Series

Depth class: Very deep
Drainage class: Well drained
Depth to seasonal high water table: More than 6.0 feet
Permeability: Moderate
Parent material: Old alluvium and colluvium derived from low-grade metasedimentary rock
Landscape: Valleys of low mountains and intermountain hills, dominantly along Tallulah, Sweetwater, and Dry Creeks, in the central and northeastern parts of the county
Landform: High stream terraces
Landform position: Benches
Slope range: 2 to 15 percent
Taxonomic classification: Fine, mixed, semiactive, mesic Typic Hapludults

Typical Pedon

Unison loam, 2 to 8 percent slopes; in Graham County; about 7.50 miles northeast of Robbinsville, 0.85 mile southeast from N.C. Highway 28 on Secondary Road 1226, about 540 feet east in a field; USGS Hewitt topographic quadrangle; lat. 35 degrees 21 minutes 52 seconds N. and long. 83 degrees 41 minutes 40 seconds W.

Ap—0 to 9 inches; brown (7.5YR 4/3) loam; moderate fine and medium granular structure; very friable; common fine and medium roots throughout; common fine flakes of mica; 5 percent, by volume, gravel; moderately acid; abrupt smooth boundary.
Bt1—9 to 22 inches; strong brown (7.5YR 4/6) gravelly clay loam; moderate fine and medium subangular blocky structure; firm; sticky, slightly plastic; few medium roots throughout; common distinct clay films on the faces of peds; few fine flakes of mica; 20 percent, by volume, gravel; strongly acid; clear wavy boundary.
Bt2—22 to 40 inches; strong brown (7.5YR 4/6) gravelly clay; moderate medium subangular blocky structure; firm; slightly sticky, slightly plastic; few distinct clay films on the faces of peds; few fine flakes of mica; 30 percent, by volume, gravel; very strongly acid; clear wavy boundary.
BC—40 to 80 inches; strong brown (7.5YR 4/6) very gravelly clay loam; moderate medium subangular blocky structure; friable; few fine flakes of mica; 30 percent, by volume, gravel and 10 percent cobbles; very strongly acid.

Range in Characteristics

Solum thickness: 30 to more than 60 inches
Depth to bedrock: More than 60 inches
Content of mica flakes: Few or common

Content and size of rock fragments: Less than 20 percent, by volume, in the Ap, A, BA, and Bt horizons and less than 50 percent in the underlying horizons; dominantly rounded gravel or cobbles but including stones
Soil reaction: Very strongly acid to moderately acid in the A and B horizons, except where surface layers have been limed, and strongly acid to neutral in the C horizon

Ap horizon:
Color—hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 3 to 6; where value is 3 or less, the A horizon is less than 7 inches thick
Texture (fine-earth fraction)—fine sandy loam or loam

BA horizon (if it occurs):
Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 6
Texture (fine-earth fraction)—clay loam

Bt horizon:
Color—hue of 5YR to 10YR, value of 4 or 5, and chroma of 3 to 8
Texture (fine-earth fraction)—clay or clay loam

BC horizon:
Color—hue of 2.5YR to 7.5YR, value of 3 to 8, and chroma of 3 to 6
Texture (fine-earth fraction)—clay loam, loam, or clay loam

C or 2C horizon (if it occurs):
Color—hue of 2.5YR to 7.5YR, value of 4 to 8, and chroma of 3 to 6
Texture (fine-earth fraction)—loam or clay loam colluvium/alluvium; sandy, gravelly, and cobbly substrata occur in some pedons

Wesser Series

Depth class: Very deep
Drainage class: Poorly drained and very poorly drained
Depth to seasonal high water table: 1.0 foot or less from January through December
Permeability: Moderately rapid in the surface horizon and upper portion of the underlying material and rapid in the lower portion
Parent material: Recent alluvium that is loamy in the upper part and sandy or sandy-skeletal in the lower part, derived from material weathered from low-grade metasedimentary rock
Landscape: Intermediate mountains in the southwestern part of the county
Landform: Hanging coves
Landform position: Planar to slightly concave toeslopes and bottomland slopes, in the upper reaches of watersheds
Slope range: 0 to 8 percent
Taxonomic classification: Sandy-skeletal, mixed, mesic Humaqueptic Fluvaquents

Typical Pedon

Wesser sandy loam in an area of Alarka-Wesser complex, 0 to 8 percent slopes, occasionally flooded; in Swain County, North Carolina; about 7.0 miles south of Whittier in the Alarka Creek watershed, from Whittier on Secondary Road 1173 to Secondary 1193, west on Secondary Road 1193 to Secondary Road 1177, south on Secondary Road 1177 to U.S. Forest Service Road 86, south on U.S. Forest Service Road 86 to Wesser Gap, about 1.1 miles south from Wesser Gap on U.S. Forest Service Road 86, about 150 feet west of the road, along a small branch; USGS Green’s Creek topographic quadrangle; lat. 35 degrees 20 minutes 6 seconds N. and long. 83 degrees 21 seconds 18 minutes W. (A representative map unit for Graham

County is on USGS Marble topographic quadrangle; lat. 35 degrees 13 minutes 46 seconds N. and long. 83 degrees 58 minutes 43 seconds W.)

Oa—0 to 3 inches; highly decomposed organic litter and root mat; extremely acid; clear wavy boundary.

A—3 to 6 inches; very dark grayish brown (10YR 3/2) sandy loam; moderate medium granular structure; very friable; many fine to coarse and common very fine roots; common fine and medium prominent strong brown (7.5YR 4/6) irregularly shaped soft masses of iron accumulations throughout; few coarse manganese concretions throughout; few fine mica flakes throughout; extremely acid; clear wavy boundary.

Cg1—6 to 13 inches; black (10YR 2/1) loamy fine sand; single grain; very friable; few fine and common medium roots; few medium and many coarse distinct very dark brown (7.5YR 2.5/3) irregularly shaped soft masses of iron accumulations throughout; few coarse manganese concretions throughout; few fine mica flakes throughout; extremely acid; clear wavy boundary.

Cg2—13 to 19 inches; black (10YR 2/1) sand; single grain; loose; few fine roots; few medium prominent strong brown (7.5YR 4/6) irregularly shaped soft masses of iron accumulations throughout; few coarse manganese concretions throughout; few fine mica flakes throughout; 5 percent, by volume, gravel; extremely acid; abrupt wavy boundary.

2C—19 to 80 inches; black (10YR 2/1) extremely gravelly sand; single grain; loose; few fine mica flakes throughout; 63 percent, by volume, gravel, 10 percent cobbles, and 5 percent stones; very strongly acid.

Range in Characteristics

Solum thickness: 11 to 20 inches

Depth to contrasting material: 11 to 20 inches to deposits of cobbles and gravel that are stratified with sandy or loamy material

Depth to bedrock: More than 60 inches

Content of mica flakes: Few or common

Content and size of rock fragments: 5 to 35 percent in horizons above the 2Cg horizon and 35 to 80 percent in the 2Cg horizon; dominantly well rounded gravel or cobbles but including stones

Soil reaction: Ultra acid to extremely acid in the O horizon and extremely acid to strongly acid in the A, B, and C horizons

O horizon:

Thickness—0 to 6 inches but can vary depending on extent and type of vegetative cover

Texture—highly decomposed to moderately decomposed organic litter and root mat

A horizon:

Color—hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 to 3

Thickness—2 to 6 inches

Texture (fine-earth fraction)—very fine sandy loam, fine sandy loam, or loam

Redoximorphic features—iron or clay depletions in shades of brown, yellow, olive, or gray

Cg horizon:

Color—hue of 10YR or 2.5Y, value of 2 to 4, and chroma of 1 to 2

Texture (fine-earth fraction)—loamy fine sand, loamy sand, or sand alluvium

Redoximorphic features—iron or clay depletions in shades of brown, yellow, olive, or gray

2C horizon:

Color—hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 or 2

Texture (fine-earth fraction)—loamy sand or sand alluvium
Other characteristics—horizon is at or below the free water table and is continually saturated year-round

Whiteoak Series

Depth class: Very deep
Drainage class: Well drained
Depth to seasonal high water table: More than 6.0 feet
Permeability: Moderately rapid in the surface horizon, moderate in the subsoil, and moderately rapid in the underlying material
Parent material: Colluvium derived from low-grade metasedimentary rock
Landscape: Low and intermediate mountains throughout the county
Landform: Coves, colluvial fans, drainageways, and benches
Landform position: Head slopes, footslopes, and toeslopes
Slope range: 8 to 30 percent
Taxonomic classification: Fine-loamy, isotic, mesic Humic Dystrudepts

Typical Pedon

Whiteoak loam in an area of Spivey-Whiteoak complex, 15 to 30 percent slopes, bouldery; in Graham County; about 4 miles south of Robbinsville, 1.90 miles north of Tatham Gap on U.S. Forest Service Road 423, about 30 feet west of the road, in woods; USGS Robbinsville topographic quadrangle; lat. 35 degrees 15 minutes 53 seconds N. and long. 83 degrees 49 minutes 13 seconds W.

Oe—0 to 1 inch; moderately decomposed organic litter and root mat; abrupt smooth boundary.
A—1 to 9 inches; very dark grayish brown (10YR 3/2) loam; moderate fine and medium granular structure; very friable; many fine and common medium and coarse roots; common fine flakes of mica; 7 percent, by volume, channers; very strongly acid; clear wavy boundary.
Bw1—9 to 34 inches; dark yellowish brown (10YR 4/4) loam; weak medium subangular blocky structure; friable; few fine and common medium roots; common fine flakes of mica; 7 percent, by volume, channers; strongly acid; gradual wavy boundary.
Bw2—34 to 46 inches; yellowish brown (10YR 5/6) loam; weak medium subangular blocky structure; friable; few medium and coarse roots; common fine flakes of mica; 5 percent, by volume, channers; strongly acid; gradual wavy boundary.
C1—46 to 60 inches; yellowish brown (10YR 5/6) channery loam; massive; very friable; common fine flakes of mica; 20 percent, by volume, channers; very strongly acid; gradual wavy boundary.
C2—60 to 80 inches; mottled dark yellowish brown (10YR 4/6), dark brown (10YR 3/3), and yellowish brown (10YR 5/6) very channery loam; massive; very friable; common fine flakes of mica; 25 percent, by volume, channers and 15 percent flagstones; very strongly acid.

Range in Characteristics

Solum thickness: 40 to more than 60 inches
Depth to bedrock: More than 60 inches
Content of mica flakes: Few or common
Content and size of rock fragments: Less than 30 percent, by volume, to a depth of 40 inches and less than 60 percent below a depth of 40 inches; ranging from channers to boulders; size and number of coarse fragments generally increase as depth increases

Soil reaction: Very strongly acid to moderately acid throughout the profile, except where surface layers have been limed

A or Ap horizon:
Color—hue of 10YR, value of 2 or 3, and chroma of 1 to 4
Thickness of the A horizon—7 to 10 inches
Texture (fine-earth fraction)—loam, silt loam, or fine sandy loam

AB or BA horizon (if it occurs):
Color—hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 8
Texture (fine-earth fraction)—loam, silt loam, or fine sandy loam

Bw horizon:
Color—hue of 7.5YR to 10YR, value of 4 to 6, and chroma of 3 to 8
Texture (fine-earth fraction)—loam, sandy clay loam, silt loam, silty clay loam, or clay loam

BC horizon (if it occurs):
Color—hue of 7.5YR to 10YR, value of 4 to 6, and chroma of 3 to 8
Texture (fine-earth fraction)—loam, sandy clay loam, silt loam, or clay loam

C horizon:
Color—variegated in shades of brown and yellow
Texture (fine-earth fraction)—loam, silt loam, fine sandy loam, sandy loam, or sandy clay loam colluvium

Formation of the Soils

This section describes the factors of soil formation and relates them to the soils in the survey area. It also discusses the processes of horizon differentiation.

Factors of Soil Formation

Soil is a three-dimensional natural body consisting of mineral and organic material that can support life. The nature of any soil at a given site is a result of the interaction of five general factors: parent material, climate, plants and animals, relief, and time. Climate and plants and animals have an effect on parent material that is modified by relief over time. Theoretically, if all these factors were identical at different sites, the soils at these sites would be identical. Differences among soils are caused by variations in one or more of these factors.

Parent Material

Parent material is the unconsolidated mass in which soil forms. It is derived from the physical and chemical breakdown of rocks. The physical and chemical composition of parent material has an important effect on the kind of soil that forms. Parent material influences the amount of sand, silt, and clay in a soil as well as acidity, color, erodibility, and other soil characteristics that affect use and management. For example, the amount of clay in a soil is directly related to the minerals that occur in the parent material. The amount of clay affects such factors as workability, fertilizer and water retention, and the performance of septic tank filter fields.

The soils of Graham County formed from parent material that has slowly accumulated from the weathering of consolidated bedrock or has been transported and deposited by the forces of water and gravity. Major differences in parent material, such as texture, can be observed in the field. Less distinct differences, such as in mineralogical composition, are determined by careful laboratory analysis. The three main types of parent material in Graham County are residuum, colluvium, and alluvium (fig. 53).

Residuum

Residuum occurs throughout the county on ridgetops and side slopes of intermountain hills and low, intermediate, and high mountains. Residual parent material is the result of bedrock weathering in place. The kind and thickness of the residuum is, in part, related to the mineral composition of the consolidate bedrock and its degree of resistance to weathering. In Graham County, residuum is derived from low-grade metasedimentary rocks.

Low-grade metasedimentary rocks such as phyllite, metasandstone, and metagraywacke are the parent material for Soco, Junaluska, Sylco, and Jeffrey soils (fig. 54). These soils are brown, yellow, or red, have bedrock dominantly within a depth of 60 inches, and are low in natural fertility. They occur throughout the county.

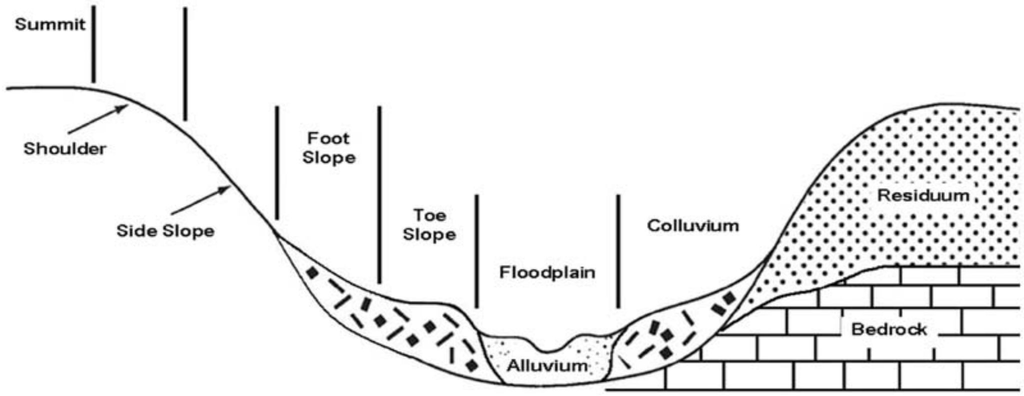


Figure 53.—Relationships between landform position and parent material.

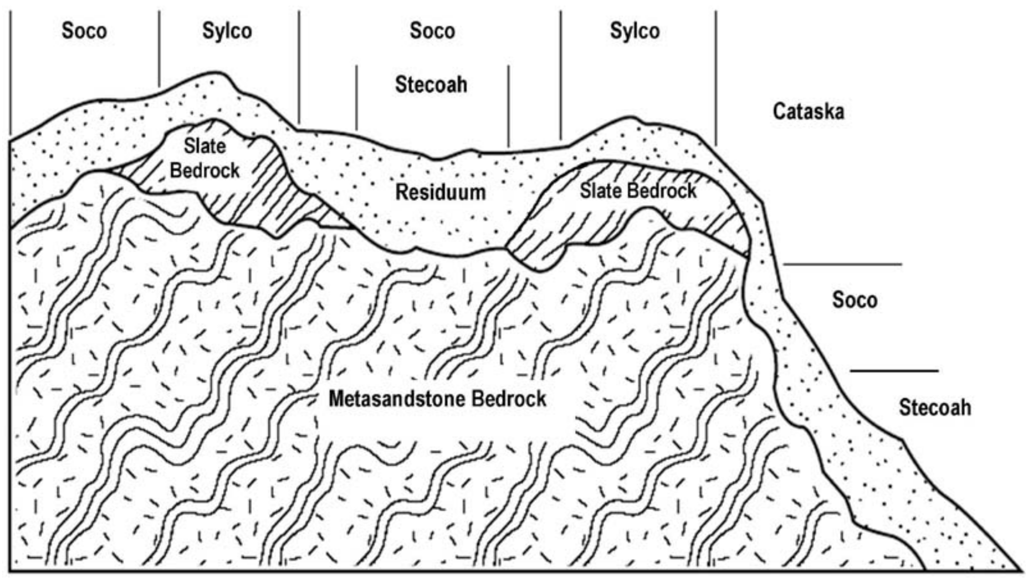


Figure 54.—A cross section showing the relationship of Soco, Sylco, Stecoah, and Cataska soils to landscape. Areas of slate are thinly bedded, more resistant to weathering, and typically shallower to bedrock. Soils are variable in these areas due to the natural fluctuation of the rock layers.

Colluvium

Colluvium is distributed throughout Graham County in coves, on benches, on footslopes, on toeslopes, and in sloping drainageways. Colluvial soils formed in parent material that has slid or fallen down slope under the influence of gravity. This can occur slowly over time or by sudden movements. Colluvial soils are loamy and very deep and contain angular to subrounded rock fragments that increase in quantity as depth increases. Surface stones are common. Examples of these soils are Thurmont, Lonon, Northcove, Whiteoak, Spivey, Santeetlah, and Alarka (fig. 55). Dillard, Statler, and Hemphill soils are unique in that they formed in colluvium on toeslopes and old alluvium on low terraces. Braddock and Unison soils formed in old alluvium on high terraces.

Figure 55.—An area of Lonon-Northcove complex, 8 to 15 percent slopes, bouldery. Surface fragments may inhibit land use and management.

Large mountain coves are the result of sudden, swift mass movements called debris avalanches. These areas produce extremely stony or bouldery colluvium. Smaller cove and footslope landscapes are scattered throughout the mountains. In these areas, the colluvial material contains fewer rock fragments and was deposited in a slower process called soil creep. Upland soils that have steep or very steep slopes typically formed from a combination of residuum and soil creep material.

Alluvium

Alluvium is soil material or rock fragments, or both, that were deposited by moving water. Soils that formed in recent alluvium are on active flood plains along the larger streams, such as the Little Tennessee and Cheoah Rivers. Alluvial soils have very little development because the soil-forming processes are interrupted by each flooding event. The texture of the alluvial material varies depending on the speed of the flood water, the duration of flooding, and the distance from the streambank. Alluvial soils are commonly stratified with rounded rock fragments. Soils that formed in old alluvium occur on the higher stream terraces and on some hillslopes, typically adjacent to flood plains. Stream terraces are the remnants of ancient, higher flood plains, and most are no longer subject to deposition by recent alluvium.

Soils that formed in recent alluvium can be coarse or fine textured, depending upon their location on the flood plain. Coarse textured soils commonly occur adjacent to the stream channel and on the upper reaches of flood plains, near the base of the mountains. These soils do not have a high degree of profile development and consist mainly of sand or sand and gravel. Fine textured alluvium is deposited on the main part of the flood plain and in backwater areas adjacent to uplands. Soils that formed in fine textured alluvium have moderate profile development and predominantly loamy textures. In general, soils closest to the headwaters show the least soil development and are shallower to strata with a high content of rock fragments. Dellwood, Cullowhee, Ela, and Wesser soils are examples. Flood plains farther downstream

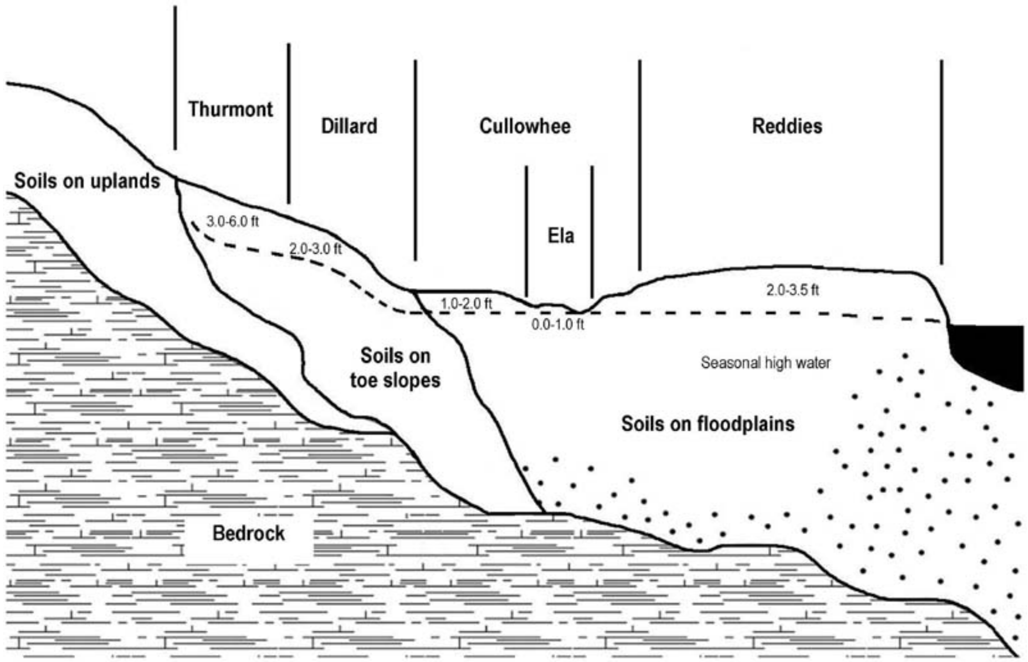


Figure 56.—A cross section showing the relationship between flood plains, low terraces, and colluvial soils with a seasonal high water table.

receive more parent material that has undergone more mechanical weathering. The soils in these areas show slightly more development. Reddies soils are an example. Adjacent to the largest streams and the Little Tennessee River system, where flooding is frequent and water velocity is high, small areas of sandier soils may form (fig. 56).

Soils on stream terraces and footslopes that formed in old alluvium have well developed profiles and horizons. They have a loamy or clayey subsoil, depending upon the geologic time period in which the alluvium was deposited. Soils that have a clayey subsoil formed in the most ancient alluvial deposits. Loamy soils formed in less ancient alluvium. Dillard, Statler, and Hemphill soils are unique in that they formed in colluvium on toeslopes and old alluvium on low terraces. Braddock and Unison soils formed in old alluvium on high terraces.

Parent material in the county is a major factor in determining what kind of soil forms and can be correlated to some degree to geologic formations. The general soil map may serve as an approximate guide to the geology of the county.

Climate

Climate affects the chemical, biological, and physical relationships in the soil primarily through the influences of precipitation and temperature. Annual rainfall varies considerably across Graham County. It ranges from about 60 to more than 82 inches.

Rain water, a weak acid, chemically dissolves rocks, minerals, and organic matter, releasing the nutrients needed for life in the soil. Water transports organic matter, soil particles, and nutrients through the soil. The effects of climate also control the biological relationships among plants and other soil life. Temperature influences the kind and growth of organisms and the speed of physical and chemical reactions in the soil. The freeze-thaw cycle also affects the formation of soils by assisting in the breakdown of rock into parent material.

Localized microclimates, the result of unique combinations of climate, aspect, landscape position, and elevation, are important to the soil-forming process (fig. 57).

Figure 57.—Aspect, elevation, and relief influence soil formation. Microclimates on cool, shaded slopes, shown here, have higher moisture and organic matter contents and lower soil temperatures.

For example, the high amounts of rainfall and cool temperatures of high mountains produce brown, medium textured soils that have a high content of organic matter in the surface layer. The warmer temperatures and lower amounts of rainfall of the low mountains typically produce redder soils that have less organic matter in the surface layer and more clay in the subsoil. Both areas host distinctly different plant and animal communities, indicating that unique environmental factors are at work.

Plant and Animal Life

Plant and animal life influences the formation of soil, including the differentiation of soil horizons. The kind and number of organisms that exist in and on the soil are determined to a large extent by climate, parent material, relief, and the age of the soil. Bacteria, fungi, and other microscopic organisms aid in the weathering of rock, the decomposition of organic matter, and the mixing of the surface layers. The larger plants and animals furnish organic matter and transfer elements from the subsoil to the surface soil. The soil properties this affects include color, structure, reaction, and the content and distribution of organic matter.

Trees and plants take up nutrients from deeper parts of the soil and add them to the surface as leaves, twigs, roots, etc. This organic matter is chemically and physically altered by micro-organisms, earthworms, and higher forms of life. The nutrients are mineralized and leach into the root zone. Other plants take up these nutrients, continuing the cycle. This process is called biocycling. Where deep-rooted plants are removed, the accumulated nutrients are lost from the system.

Human activity has significantly influenced soil formation. Native forests have been cleared for farming and other uses. Cultivation has accelerated erosion on sloping soils; wet soils have been drained; and manure, lime, chemical fertilizer, and pesticides have been applied across the landscape. Cultivation has affected soil structure and lowered the content of organic matter. The development of land for urban uses or for mining has significantly influenced the soil in some areas.

Relief

The relief or topography in Graham County is a result of mountain building, slope retreat, and the dissection of the land surfaces by major streams and tributaries. Slope retreat and dissection of the land surface are controlled by the hardness of the bedrock and the amount of uplift in the area. Relief, in turn, influences soil formation by creating differences in internal drainage, surface runoff, geologic erosion, soil temperature, and plant cover. Mountains also influence weather patterns and, thus, local climate.

Internal soil drainage is affected by landscape position. Soils on ridgetops and side slopes are well drained. Soils at the base of slopes and in coves can be affected by seeps and springs. On flood plains, soils next to the streams are commonly well drained while soils farther back can have a high water table.

Surface runoff and geologic erosion increase as slope increases. This reduces the amount of water that percolates through the soil. Thus, soils on steep side slopes are less developed. Soil creep also influences soil formation on mountainous terrain. Generally, the upper part of most soils on side slopes formed in material that is very slowly moving down slope. The extent of soil creep is controlled by time, steepness of slope, and slope length. Soils that formed on ridgetops and shoulder slopes are much less affected by soil creep and may be the only soils that are completely residual. Generally, soil depth increases as distance down slope increases. Maximum soil thickness occurs in concave areas, in coves, and on footslopes and toeslopes.

Relief influences soil temperature, moisture, and content of organic matter through aspect and elevation. For example, south- to west-facing slopes receive direct sunlight and warm up earlier in the spring. Soils on north- to east-facing slopes and those shaded by the higher mountains are cooler, retain more moisture, and thus have a higher content of organic matter in the surface layer. Conditions are similar for areas at elevations above 4,000 feet which are cooler and receive more rainfall. Together these conditions affect soil formation by regulating plant and animal activity and the weathering process.

Time

The amount of time parent material is exposed to the soil-forming processes accounts for some of the differences between soils. The horizons in a soil profile also take a long time to develop. This development proceeds at a rate dependent upon climate, relief, parent material, and the activity of plants and animals. Soil formation is a function of geologic time although flooding, erosion, and landslides affect soils in a human timeframe.

The soils of Graham County vary considerably in age. The oldest soils occur on warm, stable uplands. Brasstown and Junaluska soils are examples. Older soils generally have had more time for clay to form, move down through the soil profile, and accumulate. Their horizons are more defined than those of young soils.

Most soils in the county are relatively young and less developed. On uplands, these soils include Stecoah and Soco. One reason these soils have not had time to develop further is the steepness of slope. Geologic erosion and the movement of water down slope instead of through the soil work against soil formation. The soils at the high elevations, such as Luftee, Anakeesta, Breakneck, and Pullman, are young partially due to climatic factors that have not allowed enough time for favorable temperatures to drive soil development.

Northcove, Spivey, and Santeetlah are examples of young soils in coves. These soils are on more active landscapes where they receive material from geologic erosion. In addition, water moves through these soils as seeps and springs, carrying clay particles out of the soil.

Figure 58.—The reduction and oxidation of iron occurs in soils that have restricted natural drainage or are saturated with water on a regular basis.

The youngest soils formed in alluvium on flood plains. This landscape is also less stable or more active because flooding adds or takes away soil material. Examples of the youngest soils are Dellwood, Reddies, and Cullowhee.

Processes of Horizon Differentiation

One or more soil-forming processes are involved in the formation of soil horizons. These processes are the accumulation of organic matter; the leaching of bases and other soluble material; the chemical weathering, mainly by hydrolysis, of primary minerals into silicate clay minerals; the translocation of silicate clay and some silt-sized particles from one horizon to another; and the reduction and transfer of iron. These processes are also referred to as additions, removals, transfers, and transformations.

Some organic matter has accumulated in all of the soils in the survey area. Most of the soils contain moderate amounts of organic matter in the surface layer. The content of organic matter ranges from low, as in Braddock soils, to very high, as in Luftee soils.

Most of the soils in the survey area are acidic in the upper layers, unless the surface layer has been limed. The leaching of bases occurs as water percolates down through the soil profile. Over geologic time, the relatively high amount of rainfall in the survey area has created acidic conditions in the soils.

The translocation of clay minerals is an important process in the development of many soils in the survey area. As clay minerals are removed from the A horizon, they accumulate as clay films on the faces of peds, in pores, and in root channels in the B horizon. The amount of translocated clay is low in Soco and Stecoah soils and high in Braddock and Unison soils.

As silicate clay forms from primary minerals, some iron is commonly released as hydrated oxides. These oxides are generally red. Even if they occur in small amounts, they give the soil material a brownish color. They are largely responsible for the strong brown, yellowish brown, reddish brown, or red colors that are dominant in the subsoil of soils in the survey area.

The reduction and transfer of iron has occurred in all of the soils that are not characterized by good natural drainage. This process, known as gleying, is evidenced by a gray matrix color and by iron or clay depletions. Some of the iron may be reoxidized and segregated and thus form yellow, brown, red, or other brightly colored masses of iron accumulation in an essentially gray matrix in the subsoil (fig. 58). Nodules or concretions of iron or manganese also commonly form as a result of this process. Soil features associated with chemically reduced iron are referred to as redoximorphic features (Vepraskas, 1992). The somewhat poorly drained Cullowhee soils and the poorly drained Hemphill soils display many of these features.

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Glossary

Access road. A road constructed to facilitate the use and management of the land. Access roads are designed for limited traffic and typically consist of a cut slope, a roadbed, and a fill outslope.
Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.
Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.
Alluvial fan. The fanlike deposit of a stream where it issues from a gorge upon a plain or of a tributary stream near or at its junction with its main stream.
Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.
Alpha,alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.
Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.
Alteration zone. An area of mineralogic change in a rock brought about by physical or chemical means.
Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.
Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.
Aquifer. A water-bearing bed or stratum of permeable rock, sand, or gravel capable of fielding considerable quantities of water to wells or springs.
Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.
Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.
Arkose. A sandstone containing 25 percent or more of feldspar generally derived from the disintegration of felsic igneous rock.
Arkosic. Feldspar content in arenites (sandstones) generally exceeds 25 percent.
Aspect. The direction in which a slope faces.
Atterberg limits. Atterberg limits are measured for soil materials passing the No. 40 sieve. They include the liquid limit (LL), which is the moisture content at which the soil passes from a plastic to a liquid state, and the plasticity index (PI), which is the water content corresponding to an arbitrary limit between the plastic and semisolid states of consistency of a soil.
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:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Ball and burlap harvest. A method of harvesting nursery plants in which burlap is wrapped around a ball of soil that is attached to the root system.

Bare-root harvest. A method of harvesting in which nursery plants are removed from the soil with their roots bare and are packed in moist shipping material.

Basal area. The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock escarpment. An intermittent to continuous band of rock outcrop usually more than 50 feet in length and 5 feet wide. Commonly associated with moderately steep to very steep soils.

Benchmark soil. A soil of large extent that holds a key position in the soil classification system or is of special significance to farming, engineering, forestry, or other uses.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Black slate. Slate that is very dark gray to black and is rich in pyrite.

Biotite. A common rock-forming mineral consisting primarily of ferromagnesian silicate minerals. Color ranges from dark brown to green in thin section. Biotite is commonly referred to as “black mica” because of the natural black color.

Borrow pit. An open excavation from which the soil and underlying material have been removed, generally for use in road construction. Borrow pits support few or no plants without major reclamation. Areas identified on the detailed soil maps by a special symbol typically are less than 2 acres in size.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Broad-based dips. Short sections of access road having a reverse grade that intercept storm water. The dips are spaced about 200 feet apart and are designed to divert water away from stream crossings or steep grades.

Cable logging. A method of moving felled trees to a landing for transport to a processing facility. Most cable logging systems involve use of a truck-mounted drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are yarded and reeled in while one end is lifted or the entire log is suspended. Because this system minimizes road construction, it is used in logging steep side slopes and for reducing operational costs.

California bearing ratio (CBR). The load-supporting capacity of a soil as compared to that of standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Catsteps. Very small, irregular terraces on steep hillsides, especially in pasture, formed by the trampling of cattle or the slippage of saturated soil.

Channery soil material. Soil material that has, by volume, 15 to 35 percent thin, flat fragments of metasandstone, slate, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

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 depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

Clayey. A general textural term that includes sandy clay, silty clay, and clay. According to family level criteria in the soil taxonomic system, a specific textural name referring to fine earth (particles less than 2 millimeters in size) containing 35 percent or more clay, by weight, within the control section. The content of rock fragments is less than 35 percent, by volume.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

COLE (coefficient of linear extensibility). See Linear extensibility.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Coastal Plain. The physiographic region of eastern North Carolina that consists of ocean-deposited sediments of sand, silt, and clay. These sediments are in level to rolling areas and vary in thickness.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

Colluvial fan. A fan-shaped area of soils deposited by mass-wasting (direct gravitational action) and local unconcentrated runoff on and at the base of steeper side slopes.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the “Soil Survey Manual.”

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

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 that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cove. A gently sloping to very steep, concave colluvial area commonly located at the head of drains and along drainageways in mountainous areas. Coves are long and narrow along drainageways extending up into the mountains and become wide and bowl shaped where streams flow out of the mountains and into the valleys.

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.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cross-slope farming. Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Dbh (diameter at breast height). The diameter of a tree at 4.5 feet above the ground level on the uphill side.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Delineation. Each individual area drawn on the map. Soil delineations represent landforms, such as flood plains, terraces, coves, side slopes, and ridges. They contain the named components as well as similar and dissimilar inclusions. A collection of soil delineations with the same name is called a map unit.

Denitrification. The biochemical reduction of nitrate or nitrite to gaseous nitrogen either as molecular nitrogen or as an oxide of nitrogen.

Depression (depressional area). A portion of land surrounded on all sides by higher land. These areas generally do not have outlets for drainage.

Depth class. Refers to the depth to a root-restricting layer. Unless otherwise stated, this layer is understood to be consolidated bedrock. The depth classes in this survey are:

Very shallow	less than 10 inches
Shallow	10 to 20 inches
Moderately deep	20 to 40 inches
Deep	40 to 60 inches
Very deep	more than 60 inches

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Dispersion (soils). The breakup of compound particles, such as soil aggregates or saprolite, into single grains, resulting in a highly erosive condition. This phenomenon results from the failure of grains to adhere or bond to one another and generally is associated with a high water content in soil containing high levels of sodium.

Dissimilar inclusions (soil). Soils that affect use or management differently than the named components of a map unit. They comprise less than 25 percent of each map unit and vary from delineation to delineation. Nonlimiting dissimilar inclusions have soil properties that should not conflict with use and management. Limiting inclusions have soil properties that could interfere with use and management and special considerations may be necessary to overcome them.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Divided-slope farming. A form of field stripcropping in which crops are grown in a systematic arrangement of two strips, or bands, across the slope to reduce the hazard of water erosion. One strip is in a close-growing crop that provides protection from erosion, and the other strip is in a crop that provides less protection from erosion. This practice is used where slopes are not long enough to permit a full stripcropping pattern to be used.

Downcutting. The removal of material by the moving water in streams.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or near 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.

Drainage, surface. Runoff, or surface flow of water, from an area.

Drainageway. A narrow, gently sloping to very steep, concave colluvial area along an intermittent or perennial stream.

Droughty. The soil does not hold enough water for plants during dry periods.

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

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Environment hazard risk. The risk of polluting streams with sulfuric acid. It relates to amount of landslides and how much pyrite is in the slide material. The rock fragments in the slide material tend to weather when exposed on the surface, releasing sulfuric acid into the environment. Sulfuric acid rapidly lowers the pH in streams, adversely affecting aquatic life.

Eroded (soil phase). Because of erosion, the soil has lost an average of 25 to 75 percent of the original A horizon or the uppermost 2 to 6 inches if the original A horizon was less than 8 inches thick.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Erosion classes. Classes based on estimates of past erosion. The classes are as follows:

Class 1.—Soils have lost some of the original A horizon but on average less than 25 percent of the original A horizon or of the uppermost 8 inches (if the original A horizon was less than 8 inches thick). Throughout most areas, the thickness of the surface layer is within the normal range of variability of the uneroded soil. Class 1 erosion typically is not designated in the name of the map unit or in the map symbol.

Class 2.—Soils have lost an average of 25 to 75 percent of the original A horizon or of the uppermost 8 inches (if the original A horizon was less than 8 inches thick). Throughout most cultivated areas, the surface layer consists of a mixture of the original A horizon and material from below. Some areas may have intricate patterns ranging from uneroded spots to spots where all of the original A horizon has been removed.

Class 3.—Soils have lost an average of 75 percent or more of the original A horizon or of the uppermost 8 inches (if the original A horizon was less than 8 inches thick). In most cultivated areas, material that was below the original A horizon is exposed. The plow layer consists entirely or largely of this material.

Class 4.—Soils have lost all of the original A horizon or of the uppermost 8 inches (if the original A horizon was less than 8 inches thick) plus some or all of the deeper horizons in most areas. The original soil can be identified only in spots. Some areas may be smooth, but most have an intricate pattern of gullies.

Erosion hazard. A term describing the potential for future erosion, inherent in the soil itself, in inadequately protected areas. The following definitions are based on estimated annual soil loss in metric tons per hectare (values determined by the Universal Soil Loss Equation assuming bare soil conditions and using rainfall and climate factors for North Carolina):

0 tons per hectare	none
Less than 2.5 tons per hectare	slight
2.5 to 10 tons per hectare	moderate
10 to 25 tons per hectare	severe
More than 25 tons per hectare	very severe

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

Evapotranspiration. The combined loss of water from a given area through surface evaporation and through transpiration by plants during a specified period.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fast intake (in tables). The rapid movement of water into the soil.

Fault. A surface of rock rupture along which there has been differential movement.

Faulting. The process of fracturing and displacement that produces a fault.

Fen (bog). An area of very poorly drained, organic soils that are saturated throughout most of the year. Areas identified on the detailed soil maps by a special symbol typically are less than 2 acres in size.

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.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field border. A strip of perennial vegetation (trees, shrubs, or herbaceous plants) established on the edge of a field to control erosion, provide travel lanes for farm machinery, control competition from adjacent woodland, or provide food and cover for wildlife.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fill slope. A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

Fine textured soil. Sandy clay, silty clay, or clay.

Firebreak. An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

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

Flaggy soil material. Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone. A thin fragment of sandstone, slate, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flat. A general term for a level or nearly level surface or small area of land marked by little or no relief.

Flooding. The temporary covering of the soil surface by flowing water from any source, such as overflowing streams, runoff from adjacent or surrounding slopes, and inflow from high tides. The frequency of flooding generally is expressed as none, rare, occasional, or frequent. *None* means that flooding is not probable. *Rare* means that flooding is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year). *Occasional* means that flooding occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year). *Frequent* means that flooding occurs often under normal weather conditions (the chance of flooding is more than 50 percent in any year). The duration of flooding is expressed as *very brief* (less than 2 days), *brief* (2 to 7 days), *long* (7 days to 1 month), and *very long* (more than 1 month).

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Footslope. The position that forms the inner, gently inclined surface at the base of a hillslope. In profile, footslopes are commonly concave. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb. Any herbaceous plant not a grass or a sedge.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Gap. A concave, lower area between ridge crests that generally has lesser slope.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Geomorphic surface. A part of the surface of the land that represents an episode of landscape development and consists of one or more landforms. It is a mappable part of the land surface that is defined in terms of morphology (relief, slope, aspect, etc.); origin (erosional, constructional, etc.); age (absolute or relative); and stability of component landforms.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

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 as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Gravelly spot. An area of soils where the content of rock fragments generally less than 3 inches in diameter is more than 15 percent, by volume, in the surface layer, occurring in a map unit in which the surface layer of the dominant soil or soils has less than 15 percent gravel. Areas identified on the detailed soil maps by a special symbol typically are less than 2 acres in size.

Gravel pit. An open excavation in which the soil and underlying material are used as a source of sand and gravel. The excavated material is not crushed for use. Areas identified on the detailed soil maps by a special symbol typically are less than 2 acres in size.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hanging coves. Hanging coves are detached coves that are upstream and upslope from very steep side slopes where the colluvial body ends. Cascades or waterfalls usually terminate hanging coves. The colluvium ends at the base of very steep side slopes which is losing material much faster than the colluvial bodies can form.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hard to pack (in tables). The soil material is difficult to compact using regular earth-moving equipment.

Head slope. A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

High mountains. The part of the landscape that is above an elevation of about 4,600 feet. It is dominated by frigid soil temperatures.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

High-value crop. Crops, such as tobacco, vegetables, and ornamentals, that require a high level of management, are labor intensive, and have a potential for high profit per acre.

High water table (seasonal). The highest level of a saturated zone in the soil (the apparent or perched water table) over a continuous period of more than 2 weeks in most years, but not a permanent water table.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the “Soil Survey Manual.” The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

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 overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Hard, consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Hydroseeding. Applying seed, fertilizer, and mulch to steep areas by spraying a mixture of those ingredients and water under pressure from a truck.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Interbedded schist and metasandstone. Schist and metasandstone are sedimentary in origin. All the minerals in these rocks have gone through the chemical weathering cycle.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Intermediate mountains. The part of the landscape that ranges from about 3,000 to 4,800 feet in elevation. It is dominated by mesic soil temperatures.

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Intermontane valley. A narrow, low area surrounded by mountains.

Intermountain hills. Low hills in valleys between mountain ranges. They are dominated by mesic soil temperatures.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Kaolinite. An aluminosilicate clay mineral with a 1:1 layer structure; that is, a silicon tetrahedral sheet alternating with an aluminum octahedral sheet. Little or no expansion occurs when water mixes with the clay.

Jointing. The presence of fractures in a rock along which there has been no displacement.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Ksat. Saturated hydraulic conductivity. (See Permeability.)

Landfill. An area of accumulated wastes produced by human activities. These areas can be above or below the natural ground level. Areas identified on the detailed soil maps by a special symbol typically are less than 2 acres in size.

Landform. Part of a landscape, such as a ridge, mountain slope, hillslope, cove, colluvial fan, drainageway, bench, or flood plain.

Landform position. Part of a landform, such as a summit, shoulder slope, nose slope, side slope, toeslope, footslope, or bottomland slope.

Landing. An area where felled trees are brought for loading and transport to a processing facility.

Landscape. A relatively large portion of land. Examples are high, intermediate, and low mountains; intermountain hills; and valleys.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

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

Leeward. The direction downwind from the point of reference. The area protected from the elements; the dry portion of a rain shadow.

Linear extensibility. Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at $^1/_3$- or $^1/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Line-out beds. Elevated planting beds where woody ornamentals and Christmas tree seedlings are grown for 1 or 2 years until they are of adequate size for planting and rapid establishment in the field.

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.

Loamy. A general textural term that includes coarse sandy loam, sandy loam, fine sandy loam, very fine sandy loam, loam, silt loam, silt, clay loam, sandy clay loam, and silty clay loam. According to family level criteria in the soil taxonomic system, a specific textural name referring to fine earth (particles less than 2 millimeters in size) of loamy very fine sand or finer textured material that contains less than 35 percent clay, by weight, within the control section. The content of rock fragments is less than 35 percent, by volume.

Locally important farmland. Farmland not identified as having national or statewide importance but used in the production of food, feed, fiber, forage, and oilseed crops. It includes land previously cleared and at least in pasture or hayland production or orchards and vineyards, seed beds and line-out beds for ornamental crop production, and Christmas tree production. Most areas require a more hands-on approach to production, less mechanization, and less ground-disturbing activities than typical row crop production. The costs of production are considered acceptable by the producer and the agricultural community.

Low mountains. The part of the landscape that ranges from about 2,500 to 3,500 feet in elevation. It is dominated by mesic soil temperatures.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Low stream terrace. A terrace in an area that floods, commonly 3 to 10 feet higher in elevation than the adjacent flood plain.

Low strength. The soil has a low resistance to deforming, sliding, or failure. It is not strong enough to support loads.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Mass wasting. A single event in which a large amount of soil and rock material is moved; a landslide.

Mean annual increment. The average annual volume of a stand of trees from the year of origin to the age under consideration.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Meta-arkose. An arkose that has undergone some degree of metamorphism.

Metagraywacke. A metamorphosed, dark gray, firmly indurated, coarse grained sandstone that consists of poorly sorted, angular to subangular grains of quartz and feldspar with a variety of dark rock and mineral fragments embedded in a complex clayey matrix.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Metasedimentary rock. Metamorphosed sedimentary rocks, such as phyllite, metasandstone, and conglomerate.

Micas. A group of silicate minerals characterized by sheet or scale cleavage. Biotite is the ferromagnesian black mica. Muscovite is the potassic white mica.

Microrelief. The concave to convex changes in the land surface occurring over a relatively short distance or within a small area, such as 1 acre.

Mine or quarry (map symbol). An open excavation from which the soil and underlying material have been removed, exposing bedrock; or the surface opening to underground mines. Areas identified on the detailed soil maps by a special symbol typically are less than 2 acres in size.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

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

Mottling, soil. Irregular spots of different colors that vary in number and size. 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).

Mountain. A natural elevation of the land surface, rising more than 1,000 feet above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can occur as a single, isolated mass or in a group forming a chain or range.

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Muscovite. A nonferromagnesian rock-forming silicate mineral that has tetrahedra arranged in sheets. Commonly called “white mica” and sometimes called potassic mica.

Native pasture. Pasture that has seeded naturally in native grasses. It is on slopes too steep to manage with modern machinery.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

Nose slope. A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent. Nose slopes are convex down the slope and convex across the slope.

No-till planting. A method of planting crops in which there is virtually no seedbed preparation. A thin slice of the soil is opened, and the seed is planted at the desired depth.

Nutrient leaching. The movement of soluble fertilizer (and soil-applied pesticides) by percolating water below plant roots and possibly into the water table.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic mats. Organic mats are thin layers (4 to 8 inches) of organic material over mineral soil. The organic mats are largely from rhododendron or laurel litter with lesser amounts of red spruce or white pine and hemlock.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Overstory. The portion of the trees in a forest stand forming the upper crown cover.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Perched water table. A saturated zone of water in the soil standing above an unsaturated zone. It is usually caused by abrupt textural changes between soil horizons or the occurrence of compacted layers. These conditions cause percolating water to become restricted or perched within the soil.

Percolation. The movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Perennial stream. A stream, or reach of a stream, that flows continuously throughout the year.

Perennial water. An area that generally provides water for human or livestock consumption; commonly a lake, pond, river, or stream. Areas identified on the detailed soil maps by a special symbol typically are less than 2 acres in size.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Pesticide. Chemical formulations used to control insects and other animals, disease, and plant growth. Common pesticides include insecticides, animal repellents and baits, fungicides, defoliants, and herbicides. Their use and application is controlled by State and Federal regulations.

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Phytophthora root rot. A soil-borne disease caused by the fungus *Phytophthora cinnamomi*. Originally introduced from Asia, the disease is spread by the movement of contaminated soil, water, or infected plant material. Out of a thousand species of woody plants that are hosts to phytophthora root rot, Fraser fir is one of the most susceptible. Growth of the disease is favored by soil and landform conditions that restrict the movement of air and water in the soil. Conditions include high clay contents, saturation by high water tables, flooding and ponding, and water retention for extended periods by a high content of organic matter in the surface layer.

Piedmont. The physiographic region of central North Carolina characterized by rolling landscapes formed from the weathering of residual rock material.

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Pods. Metamorphic rock bodies that are long in one dimension and short in two dimensions with their long axis most commonly parallel to layering.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture, and at the proper time of day.

Prime farmland. Land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. The slope ranges mainly from 0 to 8 percent.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Rain shadow. A region on the lee side of mountains or hills that receives significantly less rainfall than land on the windward side, because prevailing winds rise, cool, and thereby lose most of their moisture through precipitation before reaching the lee side. An area on the side of a mountain barrier that is sheltered from prevailing winds and rain-bearing clouds, resulting in relatively dry conditions.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly 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

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth’s surface; the loose earth material above the solid rock.

Reforestation. The process in which tree seedlings are planted or become naturally established in an area that was once forested.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Ridge. A long, narrow elevation of the land surface, usually having a sharp crest and steep sides.

Ridge nose. The downward-sloping convex terminal point of a main ridge or a spur ridge.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Rime ice. Windblown ice that accumulates on tree branches mainly on exposed ridges and upper side slopes and at the higher elevations. The weight of the ice can cause branches to break.

Rippable. Bedrock or a hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 drawbar horsepower rating.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rock outcrop. An area of exposed bedrock in a map unit that has less than 0.1 percent exposed bedrock. Areas identified on the detailed soil maps by a special symbol typically are less than 2 acres in size.

Rooting depth (in tables). The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Runoff class (surface). Refers to the rate at which water flows away from the soil over the surface without infiltrating. Six classes are recognized:

Ponded.—Little of the precipitation and water that runs onto the soil escapes as runoff, and free water stands on the surface for significant periods. The amount of water that is removed from ponded areas by movement through the soil, by plants, or by evaporation is usually greater than the total rainfall. Ponding normally occurs on level and nearly level soils in depressions. The water depth may fluctuate greatly.

Very slow.—Surface water flows away slowly, and free water stands on the surface for long periods or immediately enters the soil. Most of the water passes through the soil, is used by plants, or evaporates. The soils are commonly level or nearly level or are very porous.

Slow.—Surface water flows away so slowly that free water stands on the surface for moderate periods or enters the soil rapidly. Most of the water passes through the soil, is used by plants, or evaporates. The soils are nearly level or very gently sloping, or they are steeper but absorb precipitation very rapidly.

Medium.—Surface water flows away so rapidly that free water stands on the surface for only short periods. Part of the precipitation enters the soil and is used by plants, is lost by evaporation, or moves into underground channels. The soils are nearly level to gently sloping and absorb precipitation at a moderate rate, or they are steeper but absorb water rapidly.

Rapid.—Surface water flows away so rapidly that the period of concentration is brief and free water does not stand on the surface. Only a small part of the water enters the soil. The soils are mainly moderately steep or steep and have moderate or slow rates of absorption.

Very rapid.—Surface water flows away so rapidly that the period of concentration is very brief and free water does not stand on the surface. Only a small part of the water enters the soil. The soils are mainly steep or very steep and absorb precipitation slowly.

Saddle. A localized concave dip in a main ridge where intermittent drainage commences on the adjacent side slope.

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-sized particles.

Sandy. A general textural term that includes coarse sand, sand, fine sand, very fine sand, loamy coarse sand, loamy sand, loamy fine sand, and loamy very fine sand. According to family level criteria in the soil taxonomic system, a specific textural name referring to fine earth (particles less than 2 millimeters in size) of sand or loamy sand that contains less than 50 percent very fine sand, by weight, within the control section. The content of rock fragments is less than 35 percent, by volume.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saprolite. Unconsolidated residual material underlying the soil and grading to hard bedrock below.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Schist. A metamorphic rock that is dominantly fibrous or platy minerals. It has schistose cleavage and is a product of regional metamorphism.

Second bottom. The first terrace above the normal flood plain (or first bottom) of a river.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seep. A small area on the landscape where water oozes through the soil and causes the surface to remain wet. The water does not flow on the surface.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Severely eroded spot. An area of soil that has lost an average of 75 percent or more of the original surface layer because of accelerated erosion, occurring in a map unit in which the dominant soil or soils have lost less than 25 percent of the original surface layer. Areas identified on the detailed soil maps by a special symbol typically are less than 2 acres in size.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Short, steep slope. An area of soils that are at least two slope classes steeper than the named soils in the surrounding map unit. Areas identified on the detailed soil maps by a special symbol typically are long, narrow bands that are less than 2 acres in size. (See Slope.)

Shoulder. The position that forms the uppermost inclined surface near the top of a hillslope. It is a transition from backslope to summit. The surface is dominantly convex in profile and erosional in origin.

Shrink-swell (in tables). 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.

Side slope. A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Similar inclusions (soil). Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements. They comprise less than 50 percent each map unit and vary from delineation to delineation.

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.

Skeletal (soils). Soils that contain more than 35 percent, by volume, coarse fragments (channers, gravel, flagstones, cobbles, stones, and/or boulders).

Skidding. A method of moving felled trees to a nearby central area for transport to a processing facility. Most systems involve pulling the trees with wire cables attached to a bulldozer or a rubber-tired tractor. Generally, felled trees are skidded or pulled with one end lifted to reduce friction and soil disturbance.

Skid trails. A system of bulldozer or tractor trails quickly built to allow for the skidding or pulling of felled trees by a tractor, bulldozer, or skidder to a landing for loading and transport to a processing facility.

Slate. A fine grained metamorphic rock with well developed slaty cleavage. Formed by the low-grade regional metamorphism of shale.

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. In this survey, slope classes are as follows:

Nearly level	0 to 3 percent
Gently sloping	2 to 8 percent
Strongly sloping	8 to 15 percent
Moderately steep	15 to 30 percent
Steep	30 to 50 percent
Very steep	50 to 95 percent

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow air drainage. Cold, moist, heavy air moves slowly (drains) up and down valleys and coves and in drainageways. Where this air accumulates in low areas, frost pockets occur.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil compaction. An alteration of soil structure that ultimately can affect the biological and chemical properties of the soil. Compaction decreases the extent of voids and increases bulk density.

Soil creep. The slow mass movement of soil and soil materials down slope, primarily under the influence of gravity, facilitated by water saturation and by alternating periods of freezing and thawing.

Soil map unit. A kind of soil or miscellaneous area or a combination of two or more soils or one or more soils and one or more miscellaneous areas that can be shown at the scale of mapping for the defined purposes and objectives of the soil survey. Soil map units generally are designed to reflect significant differences in use and management among the soils of a survey area.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Soil strength. The load-supporting capacity of a soil at specific moisture and density conditions.

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Specialty crops. Crops, such as Fraser fir grown for use as Christmas trees, that require intensive management and a specific combination of soils and climate.

Spring. A small area on the landscape where water flows naturally through the soil onto the surface.

Spur ridge. A sharply convex portion of a mountain side slope extending from the main ridge to some point at a lower elevation.

Stand density. The degree to which an area is covered with living trees. It is usually expressed in units of basal areas per acre, number of trees per acre, or the percentage of ground covered by the tree canopy as viewed from above.

Statewide important farmland. Farmland that is nearly prime farmland and can economically produce high yields of crops when treated and managed according to acceptable farming methods. Some areas may produce as high a yield as prime farmland if conditions are favorable. In general, soils that do not quite meet the requirements for prime farmland fall into this category. This could be due to steepness of slope, permeability, susceptibility to erosion, low available water capacity, or some other soil property. The following guidelines were selected to help define farmland of statewide importance in North Carolina:

1. Soils with slopes of more than 15 percent are excluded.
2. Soils with stony, very stony, extremely stony, very cobbly, and bouldery phases are excluded.
3. Soils with severely eroded phases are excluded.
4. Wet soils that have very slow permeability (0.06 in/hr) are excluded.
5. Somewhat poorly drained, poorly drained, and very poorly drained soils that are not drained are excluded.
6. Soils that are frequently flooded during the growing season are excluded.
7. Soils that are droughty (have an available water capacity of 3 inches or less to a limiting layer or to a depth of 40 inches) are excluded.
8. Soils with rocky phases or soils that have rock outcrop in the map unit name are excluded.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stony spot. An area where 0.01 to 0.1 percent of the surface is covered by rock fragments larger than 10 inches in diameter. Areas identified on the detailed soil maps by a special symbol typically are less than 2 acres in size.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsidence. A pronounced reduction in volume in some drained soils because of the removal of water, shrinkage of organic material, and oxidation of organic compounds. Generally associated with soils that have a high content of organic matter.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon that has a lower organic matter content than the overlying surface layer.

Suitability ratings. Ratings for the degree of suitability of soils for pasture, crops, woodland, and engineering uses. The ratings and the general criteria used for their selection are as follows:

Well suited.—The intended use may be initiated and maintained by using only the standard materials and methods typically required for that use. Good results can be expected.

Suited.—The limitations affecting the intended use make special planning, design, or maintenance necessary.

Poorly suited.—The intended use is difficult or costly to initiate and maintain because of certain soil properties, such as steep slopes, a severe hazard of erosion, a high water table, low fertility, and a hazard of flooding. Major soil reclamation, special design, or intensive management practices are needed.

Unsuited.—The intended use is very difficult or costly to initiate and maintain, and thus it generally should not be undertaken.

Summit. The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the “plow layer,” or the “Ap horizon.”

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is 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 stream, river, lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying “coarse,” “fine,” or “very fine.”

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The position that forms the gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

Topography. The relative positions and elevations of the natural or manmade features of an area that describe the configuration of its surface.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.
Underlying material. Technically the C horizon; the part of the soil below the biologically altered A and B horizons.
Understory. The trees and other woody species growing under a more or less continuous cover of branches and foliage formed collectively by the upper portions of adjacent trees and other woody growth.
Upland. Land at a higher elevation, in general, than an alluvial plain or stream terrace; land above the lowlands along streams.
Very stony spot. An area where 0.1 to 3.0 percent of the surface is covered by rock fragments larger than 10 inches in diameter. Areas identified on the detailed soil maps by a special symbol typically are less than 2 acres in size.
Vitreous. Having the appearance and luster of glass.
Water bars. Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.
Water table (apparent). A thick zone of free water in the soil. The 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 saturated zone of water in the soil standing above an unsaturated zone.
Water turnouts. Small, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and to divert water off and away from the road surface.
Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.
Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.
Wetness. A general term applied to soils that hold water at or near the surface long enough to be a common management problem.
Wet spot. An area of somewhat poorly drained to very poorly drained soils that are at least two drainage classes wetter than the named soils in the surrounding map unit. Areas identified on the detailed soil maps by a special symbol typically are less than 2 acres in size. (See Drainage class.)
Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.
Windswept. A phase of a soil map unit where hardwood trees have been stunted, twisted, and gnarled due to exposure to high winter winds and frequent ice storms.
Windthrow. The uprooting and tipping over of trees by the wind.
Windward. The direction from which the wind is blowing at the time in question. The area exposed to the elements; the wet portion of a rain shadow.
Yarding paths. The paths left by cable-yarded logs that were pulled uphill or downhill to a nearby area.
Yield (forestland). The volume of wood fiber from trees harvested in a certain unit of area. Yield is usually measured in board feet or cubic feet per acre.

Tables

Table 1.—Temperature and Precipitation

(Recorded in the period 1971-2000 at Tapoco, North Carolina)

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temp. higher than--	2 years in 10 will have-- Minimum temp. lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snow-fall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January--	50.1	29.2	39.7	71	3	47	5.82	3.44	7.94	9	1.2
February-	54.6	31.3	43.0	76	6	29	5.21	3.18	7.04	9	2.2
March----	63.2	38.0	50.6	84	15	130	6.28	3.76	8.54	10	0.5
April----	72.4	44.2	58.3	89	25	254	4.76	2.75	6.55	8	0.3
May------	78.7	52.1	65.4	90	34	477	5.63	3.60	7.46	9	0.0
June-----	84.5	59.1	71.8	94	43	653	5.56	2.97	7.83	9	0.0
July-----	87.4	62.6	75.0	96	51	774	5.61	3.00	7.91	9	0.0
August---	86.4	62.0	74.2	96	51	750	4.10	2.13	5.83	8	0.0
September	80.7	57.5	69.1	93	39	574	4.15	2.08	5.94	7	0.0
October--	71.4	46.1	58.8	85	28	293	3.23	1.47	4.79	6	0.0
November-	61.8	38.2	50.0	80	18	105	4.58	3.07	5.95	7	0.0
December-	53.2	32.0	42.6	74	8	52	5.10	2.97	6.99	8	0.2
Yearly :											
Average	70.4	46.0	58.2	---	---	---	---	---	---	---	---
Extreme	101	-14	---	97	-2	---	---	---	---	---	---
Total--	---	---	---	---	---	4,138	60.03	51.98	67.78	98	4.4

* 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 degrees F).

Table 2.—Freeze Dates in Spring and Fall

(Recorded in the period 1971-2000 at Tapoco, North Carolina)

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--	Apr. 6	Apr. 23	May 2
2 years in 10 later than--	Mar. 29	Apr. 14	Apr. 27
5 years in 10 later than--	Mar. 13	Mar. 29	Apr. 17
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 31	Oct. 16	Oct. 5
2 years in 10 earlier than--	Nov. 7	Oct. 22	Oct. 14
5 years in 10 earlier than-	Nov. 22	Nov. 3	Oct. 26

Table 3.—Growing Season

(Recorded in the period 1971-2000 at Tapoco, North Carolina)

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	223	185	169
8 years in 10	233	197	177
5 years in 10	252	218	191
2 years in 10	271	240	206
1 year in 10	281	251	213

Table 4.—Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
AkB	Alarka-Wesser complex, 0 to 8 percent slopes, occasionally flooded	538	0.3
BkB2	Braddock clay loam, 2 to 8 percent slopes, moderately eroded	53	*
BkC2	Braddock clay loam, 8 to 15 percent slopes, moderately eroded	219	0.1
BkD2	Braddock clay loam, 15 to 30 percent slopes, moderately eroded	241	0.1
BnC	Braddock-Urban land complex, 2 to 15 percent slopes	137	*
BuC	Breakneck-Pullback complex, windswept, 8 to 15 percent slopes, very rocky	144	*
BuD	Breakneck-Pullback complex, windswept, 15 to 30 percent slopes, very rocky	622	0.3
BuE	Breakneck-Pullback complex, windswept, 30 to 50 percent slopes, very rocky	2,137	1.1
BuF	Breakneck-Pullback complex, windswept, 50 to 95 percent slopes, very rocky	393	0.2
ChE	Cheoah channery loam, 30 to 50 percent slopes, stony	1,899	1.0
ChF	Cheoah channery loam, 50 to 95 percent slopes, stony	4,045	2.1
CrD	Cheoah-Jeffrey complex, 15 to 30 percent slopes, rocky	1,589	0.8
CrE	Cheoah-Jeffrey complex, 30 to 50 percent slopes, rocky	5,881	3.0
CsF	Cheoah-Jeffrey complex, 50 to 95 percent slopes, very rocky	13,248	6.9
CwA	Cullowhee-Ela complex, 0 to 3 percent slopes, occasionally flooded	1,417	0.7
DAM	Dam	14	*
DeB	Dellwood-Reddies complex, 0 to 5 percent slopes, occasionally flooded	1,417	0.7
DrB	Dillard loam, 1 to 5 percent slopes, rarely flooded	368	0.2
DtD	Ditney-Unicoi-Rock outcrop complex, 15 to 30 percent slopes, very stony	726	0.4
DtE	Ditney-Unicoi-Rock outcrop complex, 30 to 50 percent slopes, very stony	1,409	0.7
DtF	Ditney-Unicoi-Rock outcrop complex, 50 to 95 percent slopes, very stony	11,983	6.2
EtA	Ela silt loam, 0 to 2 percent slopes, occasionally flooded	539	0.3
FvA	Fluvaquents, ponded, 0 to 3 percent slopes, frequently flooded	104	*
HcD	Heintooga-Chiltoskie complex, 15 to 30 percent slopes, bouldery	543	0.3
HdE	Heintooga-Chiltoskie complex, 30 to 50 percent slopes, very bouldery	296	0.2
HmA	Hemphill loam, 0 to 3 percent slopes, rarely flooded	66	*
JbC	Junaluska-Brasstown complex, 8 to 15 percent slopes	301	0.2
JbD	Junaluska-Brasstown complex, 15 to 30 percent slopes	6,978	3.6
JbE	Junaluska-Brasstown complex, 30 to 50 percent slopes	12,671	6.6
JnD	Junaluska-Brasstown-Urban land complex, 8 to 50 percent slopes	208	0.1
JtD	Junaluska-Tsali complex, 15 to 30 percent slopes	2,683	1.4
JtE	Junaluska-Tsali complex, 30 to 50 percent slopes	4,331	2.2
JtF	Junaluska-Tsali complex, 50 to 95 percent slopes	5,678	2.9
LnC	Lonon-Northcove complex, 8 to 15 percent slopes, bouldery	2,020	1.0
LnD	Lonon-Northcove complex, 15 to 30 percent slopes, bouldery	2,835	1.5
LtD	Luftee-Anakeesta complex, windswept, 15 to 30 percent slopes, very rocky	109	*
LtE	Luftee-Anakeesta complex, windswept, 30 to 50 percent slopes, very rocky	63	*
LtF	Luftee-Anakeesta complex, windswept, 50 to 95 percent slopes, very rocky	167	*
NtE	Northcove-Lonon complex, 30 to 50 percent slopes, very bouldery	1,301	0.7
RdA	Reddies fine sandy loam, 0 to 3 percent slopes, occasionally flooded	1,025	0.5
SbE	Snowbird loam, 30 to 50 percent slopes, stony	5,036	2.6
SbF	Snowbird loam, 50 to 95 percent slopes, stony	5,650	2.9
ScD	Soco-Stecoah complex, 15 to 30 percent slopes, stony	1,577	0.8
ScE	Soco-Stecoah complex, 30 to 50 percent slopes, stony	2,960	1.5
ScF	Soco-Stecoah complex, 50 to 95 percent slopes, stony	9,339	4.8
SdD	Soco-Stecoah complex, 15 to 30 percent slopes, rocky	1,288	0.7
SdE	Soco-Stecoah complex, 30 to 50 percent slopes, rocky	3,584	1.9
SdF	Soco-Stecoah complex, 50 to 95 percent slopes, rocky	11,541	6.0
SnD	Soco-Stecoah complex, windswept, 15 to 30 percent slopes, stony	261	0.1
SnE	Soco-Stecoah complex, windswept, 30 to 50 percent slopes, stony	57	*
SpE	Spivey-Santeetlah complex, 30 to 50 percent slopes, very bouldery	14,657	7.6
SpF	Spivey-Santeetlah complex, 50 to 95 percent slopes, very bouldery	796	0.4
SvC	Spivey-Whiteoak complex, 8 to 15 percent slopes, bouldery	3,648	1.9
SvD	Spivey-Whiteoak complex, 15 to 30 percent slopes, bouldery	14,435	7.5
SwB	Statler loam, 2 to 8 percent slopes, rarely flooded	305	0.2
SyD	Sylco-Cataska complex, 15 to 30 percent slopes, very rocky	1,331	0.7
SyE	Sylco-Cataska complex, 30 to 50 percent slopes, very rocky	2,180	1.1
SyF	Sylco-Cataska complex, 50 to 95 percent slopes, very rocky	13,879	7.2

See footnote at end of table.

Table 4.—Acreage and Proportionate Extent of the Soils—Continued

Map symbol	Soil name	Acres	Percent
ThB	Thurmont-Dillard complex, 2 to 8 percent slopes	1,843	1.0
UdD	Udorthents-Urban land complex, 2 to 15 percent slopes	641	0.3
UdE	Udorthents-Urban land complex, 15 to 95 percent slopes	224	0.1
UnB	Unison loam, 2 to 8 percent slopes	258	0.1
UnC	Unison loam, 8 to 15 percent slopes	84	*
UoA	Udorthents-Urban land complex, 0 to 5 percent slopes, rarely flooded	558	0.3
W	Water	6,488	3.4
	Total	193,018	100.0

* Less than 0.1 percent.

Table 5.—Orchard and Ornamental Crops

(See text for definitions of "well suited," "suited," "poorly suited," and "unsuited." See detailed map unit descriptions for composition and behavior characteristics of these soils. "Slope" is considered as a limitation for safe equipment use)

Soil name and map symbol	Apples	Fraser fir[1]	Ball and burlap	Line-out beds[2]	Vegetables[3]
AkB:					
Alarka, occasionally flooded	Unsuited Flooding Wetness Climate-frost	Unsuited Flooding Wetness Phytophthora	Unsuited Flooding Wetness Phytophthora	Unsuited Flooding Wetness Phytophthora	Unsuited Flooding Wetness Climate-frost
Wesser, occasionally flooded	Unsuited Flooding Wetness Climate-frost	Unsuited Flooding Wetness Phytophthora	Unsuited Flooding Wetness Phytophthora	Unsuited Flooding Wetness Phytophthora	Unsuited Flooding Wetness Climate-frost
BkB2:					
Braddock, moderately eroded	Well suited	Poorly suited High clay Phytophthora Warm aspect	Poorly suited High clay Eroded	Unsuited High clay Phytophthora	Well suited High clay Eroded
BkC2:					
Braddock, moderately eroded	Suited Slope	Poorly suited High clay Phytophthora Warm aspect	Poorly suited High clay Eroded	Unsuited High clay Phytophthora Slope	Suited High clay Eroded Slope
BkD2:					
Braddock, moderately eroded	Suited Slope	Poorly suited Slope High clay Phytophthora Warm aspect	Poorly suited Slope High clay Eroded	Unsuited Slope High clay Phytophthora	Poorly Slope High clay Eroded
BnC:					
Braddock	Unsuited	Unsuited	Unsuited	Unsuited	Unsuited
Urban land	Unsuited	Unsuited	Unsuited	Unsuited	Unsuited
BuC, BuD, BuE, BuF:					
Breakneck, windswept	Unsuited Slope Depth to rock Climate	Unsuited Slope Depth to rock Climate	Unsuited Slope Depth to rock Climate	Unsuited Slope Depth to rock Climate	Unsuited Slope Depth to rock Climate
Pullback, windswept	Unsuited Slope Depth to rock Climate	Unsuited Slope Depth to rock Climate	Unsuited Slope Depth to rock Climate	Unsuited Slope Depth to rock Climate	Unsuited Slope Depth to rock Climate
ChE:					
Cheoah, stony	Poorly suited Slope Climate-frost	Poorly suited Slope	Poorly suited Slope Low clay	Poorly suited Slope Climate-frost	Unsuited Slope Climate-frost
ChF:					
Cheoah, stony	Unsuited Slope	Unsuited Slope	Unsuited Slope	Unsuited Slope	Unsuited Slope

Table 5.—Orchard and Ornamental Crops—Continued

Soil name and map symbol	Apples	Fraser fir[1]	Ball and burlap	Line-out beds[2]	Vegetables[3]
CrD, CrE:					
Cheoah, rocky	Poorly suited Slope Climate-frost	Poorly suited Slope	Poorly suited Slope Low clay	Poorly suited Slope Climate-frost	Unsuited Slope
Jeffrey, rocky	Unsuited Slope Depth to rock Climate-frost	Unsuited Slope Depth to rock	Unsuited Slope Depth to rock	Unsuited Slope Depth to rock	Unsuited Slope Depth to rock
CsF:					
Cheoah, very rocky	Unsuited Slope	Unsuited Slope	Unsuited Slope	Unsuited Slope	Unsuited Slope
Jeffrey, very rocky	Unsuited Slope Depth to rock	Unsuited Slope Depth to rock	Unsuited Slope Depth to rock	Unsuited Slope Depth to rock	Unsuited Slope Depth to rock
CwA:					
Ela, occasionally flooded	Unsuited Flooding Wetness Climate-frost	Unsuited Flooding Wetness Phytophthora	Unsuited Flooding Wetness	Unsuited Flooding Wetness Phytophthora	Unsuited Flooding Wetness Climate-frost
Cullowhee, occasionally flooded	Unsuited Flooding Wetness Climate-frost	Unsuited Flooding Wetness Phytophthora	Unsuited Flooding Wetness	Unsuited Flooding Wetness Phytophthora	Unsuited Flooding Wetness Climate-frost
DAM:					
Dam	Unsuited	Unsuited	Unsuited	Unsuited	Unsuited
DeB:					
Dellwood, occasionally flooded	Unsuited Flooding Droughty Climate-frost	Poorly suited Flooding Droughty Low elevation	Poorly suited Flooding Too sandy Small stones	Poorly suited Flooding Droughty Small stones Climate-frost	Poorly Flooding Droughty Small stones Climate-frost
Reddies, occasionally flooded	Unsuited Flooding Droughty Climate-frost	Poorly suited Flooding Droughty Low elevation	Poorly suited Flooding Too sandy	Suited Flooding Droughty Climate-frost	Suited Flooding Droughty Climate-frost
DrB:					
Dillard, rarely flooded	Poorly suited Climate-frost Flooding	Poorly suited High clay Phytophthora Flooding	Poorly suited Flooding Phytophthora	Poorly suited Surface clay Phytophthora Flooding	Well suited Flooding Climate-frost
DtD, DtE, DtF:					
Ditney, very stony	Unsuited Slope Depth to rock	Unsuited Slope Depth to rock Warm aspect	Unsuited Slope Depth to rock	Unsuited Slope Depth to rock	Unsuited Slope Depth to rock
Unicoi, very stony	Unsuited Slope Depth to rock	Unsuited Slope Depth to rock Warm aspect	Unsuited Slope Depth to rock	Unsuited Slope Depth to rock	Unsuited Slope Depth to rock

Table 5.—Orchard and Ornamental Crops—Continued

Soil name and map symbol	Apples	Fraser fir[1]	Ball and burlap	Line-out beds[2]	Vegetables[3]
EtA:					
Ela, occasionally flooded	Unsuited Flooding Wetness Climate-frost	Unsuited Flooding Wetness Phytophthora	Unsuited Flooding Wetness	Unsuited Flooding Wetness Phytophthora	Unsuited Flooding Wetness Climate-frost
FvA:					
Fluvaquents, frequently flooded	Unsuited Flooding Wetness Climate-frost	Unsuited Flooding Wetness Phytophthora	Unsuited Flooding Wetness	Unsuited Flooding Wetness Phytophthora Climate-frost	Unsuited Flooding Wetness Climate-frost
HcD, HdE:					
Heintooga, very stony	Unsuited Slope Large stones Climate	Unsuited Slope Large stones Climate	Unsuited Slope Large stones Climate	Unsuited Slope Large stones Climate	Unsuited Slope Large stones Climate
Chiltoskie, very stony	Unsuited Slope Large stones Climate	Unsuited Slope Large stones Climate	Unsuited Slope Large stones Climate	Unsuited Slope Large stones Climate	Unsuited Slope Large stones Climate
HmA:					
Hemphill, rarely flooded	Unsuited Wetness Climate-frost Flooding	Unsuited Wetness Phytophthora Flooding	Unsuited Wetness High clay Flooding	Unsuited Wetness Surface clay Flooding	Unsuited Wetness High clay Flooding Climate-frost
JbC:					
Junaluska	Poorly suited Depth to rock Slope	Poorly suited Depth to rock Warm aspect	Poorly suited Depth to rock	Poorly suited Depth to rock Slope	Poorly Depth to rock Slope
Brasstown	Suited Slope	Suited Warm aspect Phytophthora	Suited Slope	Poorly suited Slope Phytophthora	Suited Slope
JbD:					
Junaluska	Poorly suited Slope Depth to rock	Poorly suited Slope Depth to rock Warm aspect	Poorly suited Slope Depth to rock	Poorly suited Slope Depth to rock	Unsuited Slope Depth to rock
Brasstown	Suited Slope	Poorly suited Slope Warm aspect	Suited Slope	Poorly suited Slope	Poorly Slope
JbE:					
Junaluska	Poorly suited Slope Depth to rock	Poorly suited Slope Depth to rock Warm aspect	Poorly suited Slope Depth to rock	Poorly suited Slope Depth to rock	Unsuited Slope Depth to rock
Brasstown	Poorly suited Slope	Poorly suited Slope Warm aspect	Poorly suited Slope	Poorly suited Slope	Unsuited Slope

Table 5.—Orchard and Ornamental Crops—Continued

Soil name and map symbol	Apples	Fraser fir[1]	Ball and burlap	Line-out beds[2]	Vegetables[3]
JnD:					
Junaluska	Unsuited	Unsuited	Unsuited	Unsuited	Unsuited
Brasstown	Unsuited	Unsuited	Unsuited	Unsuited	Unsuited
Urban land	Unsuited	Unsuited	Unsuited	Unsuited	Unsuited
JtD, JtE:					
Junaluska	Poorly suited Slope Depth to rock	Poorly suited Slope Depth to rock Warm aspect	Poorly suited Slope Depth to rock	Poorly suited Slope Depth to rock	Unsuited Slope Depth to rock
Tsali	Poorly suited Slope Depth to rock	Poorly suited Slope Depth to rock Warm aspect	Poorly suited Slope Depth to rock	Poorly suited Slope Depth to rock	Unsuited Slope Depth to rock
JtF:					
Junaluska	Unsuited Slope Depth to rock	Unsuited Slope Depth to rock Warm aspect	Unsuited Slope Depth to rock	Unsuited Slope Depth to rock	Unsuited Slope Depth to rock
Tsali	Unsuited Slope Depth to rock	Unsuited Slope Depth to rock Warm aspect	Unsuited Slope Depth to rock	Unsuited Slope Depth to rock	Unsuited Slope Depth to rock
LnC, LnD:					
Lonon, bouldery	Suited Slope Large stones Climate-frost	Suited Slope Large stones	Suited Slope Large stones	Poorly suited Slope Large stones Climate-frost	Poorly Slope Large stones Climate-frost
Northcove, bouldery	Unsuited Slope Large stones	Unsuited Slope Large stones	Unsuited Slope Large stones	Unsuited Slope Large stones	Unsuited Slope Large stones
LtD, LtE, LtF:					
Luftee, windswept	Unsuited Slope Climate Large stones	Unsuited Slope Climate Large stones	Unsuited Slope Climate Large stones	Unsuited Slope Climate Large stones	Unsuited Slope Climate Large stones
Anakeesta, windswept	Unsuited Slope Depth to rock Climate Large stones	Unsuited Slope Depth to rock Climate Large stones	Unsuited Slope Depth to rock Climate Large stones	Unsuited Slope Depth to rock Climate Large stones	Unsuited Slope Depth to rock Climate Large stones
NtE:					
Northcove, very bouldery	Unsuited Slope Large stones Climate-frost	Unsuited Slope Large stones	Unsuited Slope Large stones	Unsuited Slope Large stones	Unsuited Slope Large stones
Lonon, very bouldery	Unsuited Slope Large stones Climate-frost	Unsuited Slope Large stones	Unsuited Slope Large stones	Unsuited Slope Large stones	Poorly Slope Large stones

Table 5.—Orchard and Ornamental Crops—Continued

Soil name and map symbol	Apples	Fraser fir[1]	Ball and burlap	Line-out beds[2]	Vegetables[3]
RdA:					
Reddies, occasionally flooded	Unsuited Flooding Droughty Climate-frost	Poorly suited Flooding Droughty Low elevation	Poorly suited Flooding Too sandy	Suited Flooding Droughty Climate-frost	Suited Flooding Droughty Climate-frost
SbE:					
Snowbird, stony	Poorly suited Slope	Poorly suited Slope	Poorly suited Slope	Poorly suited Slope	Unsuited Slope
SbF:					
Snowbird, stony	Unsuited Slope	Unsuited Slope	Unsuited Slope	Unsuited Slope	Unsuited Slope
ScD, ScE:					
Soco, stony	Poorly suited Slope Depth to rock Low clay	Poorly suited Slope Depth to rock Warm aspect	Poorly suited Slope Low clay Depth to rock	Poorly suited Slope Depth to rock	Unsuited Slope Depth to rock
Stecoah, stony	Poorly suited Slope Low clay	Poorly suited Slope Warm aspect	Poorly suited Slope Low clay	Poorly suited Slope	Unsuited Slope
ScF:					
Soco, stony	Unsuited Slope Depth to rock Low clay	Unsuited Slope Depth to rock Warm aspect	Unsuited Slope Low clay Depth to rock	Unsuited Slope Depth to rock	Unsuited Slope Depth to rock
Stecoah, stony	Unsuited Slope Low clay	Unsuited Slope Warm aspect	Unsuited Slope Low clay	Unsuited Slope	Unsuited Slope
SdD, SdE, SdF:					
Soco, rocky	Unsuited Slope Depth to rock Low clay	Unsuited Slope Depth to rock Warm aspect	Unsuited Slope Low clay Depth to rock	Unsuited Slope Depth to rock	Unsuited Slope Depth to rock
Stecoah, rocky	Unsuited Slope Low clay	Unsuited Slope Warm aspect	Unsuited Slope Low clay	Unsuited Slope	Unsuited Slope
SnD, SnE:					
Soco, windswept	Unsuited Slope Depth to rock Low clay Climate	Unsuited Slope Depth to rock Warm aspect Climate	Unsuited Slope Low clay Depth to rock Climate	Unsuited Slope Depth to rock Climate	Unsuited Slope Depth to rock Climate
Stecoah, windswept	Unsuited Slope Low clay Climate	Unsuited Slope Warm aspect Climate	Unsuited Slope Low clay Climate	Unsuited Slope Climate	Unsuited Slope Climate

Table 5.—Orchard and Ornamental Crops—Continued

Soil name and map symbol	Apples	Fraser fir[1]	Ball and burlap	Line-out beds[2]	Vegetables[3]
SpE, SpF:					
Spivey, very bouldery	Unsuited Slope Large stones	Unsuited Slope Large stones	Unsuited Slope Large stones	Unsuited Slope Large stones	Unsuited Slope Large stones
Santeetlah,very bouldery	Unsuited Slope Large stones	Unsuited Slope Large stones	Unsuited Slope Large stones	Unsuited Slope Large stones	Unsuited Slope Large stones
SvC:					
Spivey, bouldery	Unsuited Large stones Slope	Unsuited Large stones	Unsuited Large stones	Unsuited Large stones Slope	Unsuited Slope Large stones
Whiteoak, bouldery	Suited Large stones Climate-frost Slope	Suited Large stones	Suited Large stones Slope	Poorly suited Large stones Climate-frost	Suited Slope Large stones Climate-frost
SvD:					
Spivey, bouldery	Unsuited Large stones Slope	Unsuited Large stones	Unsuited Large stones	Unsuited Large stones Slope	Unsuited Slope Large stones
Whiteoak, bouldery	Suited Large stones Climate-frost Slope	Suited Large stones	Suited Large stones Slope	Poorly suited Large stones Climate-frost	Poorly Slope Large stones Climate-frost
SwB:					
Statler, rarely flooded	Poorly suited Climate-frost Flooding	Poorly suited High clay Phytophthora Flooding	Poorly suited Flooding	Poorly suited Surface clay Phytophthora Flooding Climate-frost	Well suited Flooding Climate-frost
SyD, SyE, SyF:					
Sylco, very rocky	Unsuited Slope Depth to rock Small stones	Unsuited Slope Depth to rock Warm aspect	Unsuited Slope Small stones Depth to rock	Unsuited Slope Depth to rock Small stones	Unsuited Slope Depth to rock Small stones
Cataska, very rocky	Unsuited Slope Depth to rock Small stones	Unsuited Slope Depth to rock Warm aspect	Unsuited Slope Small stones Depth to rock	Unsuited Slope Small stones Depth to rock	Unsuited Slope Small stones Depth to rock
ThB:					
Dillard	Well suited Climate-frost	Suited Phytophthora Low elevation	Well suited	Poorly suited Surface clay Phytophthora Climate-frost	Well suited Climate-frost
Thurmont	Well suited Climate-frost	Suited Phytophthora Low elevation	Well suited	Poorly suited Surface clay Phytophthora Climate-frost	Well suited Climate-frost
UdD, UdE:					
Udorthents	Unsuited	Unsuited	Unsuited	Unsuited	Unsuited
Urban land	Unsuited	Unsuited	Unsuited	Unsuited	Unsuited

Table 5.—Orchard and Ornamental Crops—Continued

Soil name and map symbol	Apples	Fraser fir[1]	Ball and burlap	Line-out beds[2]	Vegetables[3]
UnB:					
Unison	Well suited Climate-frost	Poorly suited High clay Phytophthora	Poorly suited High clay	Poorly suited Surface clay Phytophthora	Well suited Climate-frost
UnC:	Suited Climate-frost Slope	Poorly suited High clay Phytophthora	Poorly suited High clay Slope	Poorly suited Surface clay Phytophthora Slope	Suited Slope Climate-frost
Unison					
UoA:					
Udorthents, rarely flooded	Unsuited	Unsuited	Unsuited	Unsuited	Unsuited
Urban land	Unsuited	Unsuited	Unsuited	Unsuited	Unsuited
W.					
Water					

1 In general, elevations below 3,000 or above 4,600 feet are considered marginal to unsuited for commercial Fraser fir production due to climatic limitations.
2 In general, elevations above 4,600 feet are considered marginal to unsuited for line-out beds, except for Fraser fir, due to climatic limitations.
3 Vegetables commonly include tomatoes, squash, bell peppers, sweet corn, cucumbers, pole/bush beans, potatoes, cabbage, greens, strawberries, and melons.

Table 6.—Land Capability and Yields per Acre of Crops and Pasture, Part I

(Yields are those that can be expected under a high level of management. They are for nonirrigated areas. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Map symbol and soil name	Land capability	Cabbage	Corn	Corn silage	Burley tobacco	Tomatoes
		Crates	Bu	Tons	Lbs	Tons
AkB:						
Alarka, occasionally flooded	7w	---	---	---	---	---
Wesser, occasionally flooded	7w	---	---	---	---	---
BkB2:						
Braddock, moderately eroded	2e	---	99.00	16.00	2,413.00	18.00
BkC2:						
Braddock, moderately eroded	3e	---	89.00	14.00	2,173.00	---
BkD2:						
Braddock, moderately eroded	4e	---	---	---	1,767.00	---
BnC:						
Braddock	3e	---	---	---	---	---
Urban land	8s	---	---	---	---	---
BuC:						
Breakneck, very rocky, windswept	4s	---	---	---	---	---
Pullback, very rocky, windswept	7s	---	---	---	---	---
BuD:						
Breakneck, very rocky, windswept	4s	---	---	---	---	---
Pullback, very rocky, windswept	7s	---	---	---	---	---
BuE:						
Breakneck, very rocky, windswept	7s	---	---	---	---	---
Pullback, very rocky, windswept	7s	---	---	---	---	---
BuF:						
Breakneck, very rocky, windswept	7s	---	---	---	---	---
Pullback, very rocky, windswept	7s	---	---	---	---	---
ChE:						
Cheoah, stony	6e	---	---	---	---	---

Table 6.—Land Capability and Yields per Acre of Crops and Pasture, Part I—Continued

Map symbol and soil name	Land capability	Cabbage	Corn	Corn silage	Burley tobacco	Tomatoes
		Crates	Bu	Tons	Lbs	Tons
ChF:						
Cheoah, stony	7e	---	---	---	---	---
CrD:						
Cheoah, rocky	4e	---	---	---	---	---
Jeffrey, rocky	6s	---	---	---	---	---
CrE:						
Cheoah, rocky	6e	---	---	---	---	---
Jeffrey, rocky	7s	---	---	---	---	---
CsF:						
Cheoah, very rocky	7s	---	---	---	---	---
Jeffrey, very rocky	7s	---	---	---	---	---
CwA:						
Cullowhee, occasionally flooded	3w	---	---	---	---	---
Ela, occasionally flooded	6w	---	---	---	---	---
DAM.						
Dam						
DeB:						
Dellwood, occasionally flooded	3s	---	---	---	---	---
Reddies, occasionally flooded	2w	---	---	---	---	---
DrB:						
Dillard, rarely flooded	2w	500.00	171.00	27.00	2,538.00	28.00
DtD:						
Ditney, very stony	6s	---	---	---	---	---
Unicoi, very stony	7s	---	---	---	---	---
Rock outcrop	8s	---	---	---	---	---
DtE:						
Ditney, very stony	7s	---	---	---	---	---
Unicoi, very stony	7s	---	---	---	---	---
Rock outcrop	8s	---	---	---	---	---
DtF:						
Ditney, very stony	7s	---	---	---	---	---
Unicoi, very stony	7s	---	---	---	---	---
Rock outcrop	8s	---	---	---	---	---

Table 6.—Land Capability and Yields per Acre of Crops and Pasture, Part I—Continued

Map symbol and soil name	Land capability	Cabbage	Corn	Corn silage	Burley tobacco	Tomatoes
		Crates	Bu	Tons	Lbs	Tons
EtA:						
Ela, occasionally flooded	7w	---	---	---	---	---
Ela, undrained	7w	---	---	---	---	---
FvA:						
Fluvaquents, ponded	8w	---	---	---	---	---
HcD:						
Heintooga, bouldery	6s	---	---	---	---	---
Chiltoskie, bouldery	4c	---	---	---	---	---
HdE:						
Heintooga, very bouldery	7s	---	---	---	---	---
Chiltoskie, very bouldery	7s	---	---	---	---	---
HmA:						
Hemphill, rarely flooded	4w	---	---	---	---	---
Hemphill, undrained	6w	---	---	---	---	---
JbC:						
Junaluska	3e	---	62.00	9.80	1,245.00	---
Brasstown	3e	---	76.00	12.00	1,518.00	---
JbD:						
Junaluska	4e	---	---	---	1,095.00	---
Brasstown	4e	---	---	---	---	---
JbE:						
Junaluska	6e	---	---	---	---	---
Brasstown	6e	---	---	---	---	---
JnD:						
Junaluska	6e	---	---	---	---	---
Brasstown	6e	---	---	---	---	---
Urban land	8s	---	---	---	---	---
JtD:						
Junaluska	4e	---	---	---	---	---
Tsali	6s	---	---	---	---	---
JtE:						
Junaluska	6e	---	---	---	---	---
Tsali	6s	---	---	---	---	---
JtF:						
Junaluska	7e	---	---	---	---	---
Tsali	7s	---	---	---	---	---

Table 6.—Land Capability and Yields per Acre of Crops and Pasture, Part I—Continued

Map symbol and soil name	Land capability	Cabbage	Corn	Corn silage	Burley tobacco	Tomatoes
		Crates	Bu	Tons	Lbs	Tons
LnC:						
Lonon, bouldery	3e	---	---	---	---	---
Northcove, bouldery	6s	---	---	---	---	---
LnD:						
Lonon, bouldery	4e	---	---	---	---	---
Northcove, bouldery	6s	---	---	---	---	---
LtD:						
Luftee, very rocky, windswept	6s	---	---	---	---	---
Anakeesta, very rocky, windswept	6s	---	---	---	---	---
LtE:						
Luftee, very rocky, windswept	7s	---	---	---	---	---
Anakeesta, very rocky, windswept	7s	---	---	---	---	---
LtF:						
Luftee, very rocky, windswept	7s	---	---	---	---	---
Anakeesta, very rocky, windswept	7s	---	---	---	---	---
NtE:						
Northcove, very bouldery	6s	---	---	---	---	---
Lonon, very bouldery	6s	---	---	---	---	---
RdA:						
Reddies, occasionally flooded	2w	450.00	205.00	32.00	2,600.00	26.00
SbE:						
Snowbird, stony	6e	---	---	---	---	---
SbF:						
Snowbird, stony	7e	---	---	---	---	---
ScD:						
Soco, stony	4s	---	---	---	---	---
Stecoah, stony	4e	---	---	---	---	---
ScE:						
Soco, stony	6s	---	---	---	---	---
Stecoah, stony	6e	---	---	---	---	---
ScF:						
Soco, stony	7s	---	---	---	---	---
Stecoah, stony	7e	---	---	---	---	---

Table 6.—Land Capability and Yields per Acre of Crops and Pasture, Part I—Continued

Map symbol and soil name	Land capability	Cabbage	Corn	Corn silage	Burley tobacco	Tomatoes
		Crates	Bu	Tons	Lbs	Tons
SdD:						
Soco, rocky	4s	---	---	---	---	---
Stecoah, rocky	6e	---	---	---	---	---
SdE:						
Soco, rocky	6s	---	---	---	---	---
Stecoah, rocky	6e	---	---	---	---	---
SdF:						
Soco, rocky	7s	---	---	---	---	---
Stecoah, rocky	7s	---	---	---	---	---
SnD:						
Soco, stony, windswept	6c	---	---	---	---	---
Stecoah, stony, windswept	6c	---	---	---	---	---
SnE:						
Soco, stony, windswept	6s	---	---	---	---	---
Stecoah, stony, windswept	6c	---	---	---	---	---
SpE:						
Spivey, very bouldery	6s	---	---	---	---	---
Santeetlah, very bouldery	6s	---	---	---	---	---
SpF:						
Spivey, very bouldery	7s	---	---	---	---	---
Santeetlah, very bouldery	7s	---	---	---	---	---
SvC:						
Spivey, bouldery	6s	---	---	---	---	---
Whiteoak, bouldery	3e	---	---	---	---	---
SvD:						
Spivey, bouldery	6s	---	---	---	---	---
Whiteoak, bouldery	4e	---	---	---	---	---
SwB:						
Statler, rarely flooded	2e	400.00	200.00	31.00	2,733.00	30.00
SyD:						
Sylco, very rocky	6s	---	---	---	---	---
Cataska, very rocky	7s	---	---	---	---	---

Table 6.—Land Capability and Yields per Acre of Crops and Pasture, Part I—Continued

Map symbol and soil name	Land capability	Cabbage	Corn	Corn silage	Burley tobacco	Tomatoes
		Crates	Bu	Tons	Lbs	Tons
SyE:						
Sylco, very rocky	7s	---	---	---	---	---
Cataska, very rocky	7s	---	---	---	---	---
SyF:						
Sylco, very rocky	7s	---	---	---	---	---
Cataska, very rocky	7s	---	---	---	---	---
ThB:						
Thurmont	2e	---	112.00	20.00	1,920.00	---
Dillard	2w	500.00	171.00	27.00	2,538.00	28.00
UdD:						
Udorthents	7e	---	---	---	---	---
Urban land	8s	---	---	---	---	---
UdE:						
Udorthents	7e	---	---	---	---	---
Urban land	8s	---	---	---	---	---
UnB:						
Unison	2e	---	128.00	23.80	2,660.00	---
UnC:						
Unison	3e	---	108.00	20.00	2,240.00	---
UoA:						
Udorthents, rarely flooded	7e	---	---	---	---	---
Urban land, rarely flooded	8s	---	---	---	---	---
W.						
Water						

Table 6.—Land Capability and Yields per Acre of Crops and Pasture, Part II

(Yields are those that can be expected under a high level of management. They are for nonirrigated areas. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Map symbol and soil name	Land capability	Alfalfa hay	Cool-season grasses	Orchardgrass hay	Tall fescue hay	Timothy hay
		Tons	Tons	Tons	Tons	Tons
AkB:						
Alarka, occasionally flooded	7w	---	---	---	---	---
Wesser, occasionally flooded	7w	---	---	---	---	---
BkB2:						
Braddock, moderately eroded	2e	6.00	3.60	4.70	5.20	4.10
BkC2:						
Braddock, moderately eroded	3e	5.50	3.30	4.20	4.70	3.70
BkD2:						
Braddock, moderately eroded	4e	---	2.60	3.40	3.80	3.00
BnC:						
Braddock	3e	---	---	---	---	---
Urban land	8s	---	---	---	---	---
BuC:						
Breakneck, very rocky, windswept	4s	---	---	---	---	---
Pullback, very rocky, windswept	7s	---	---	---	---	---
BuD:						
Breakneck, very rocky, windswept	4s	---	---	---	---	---
Pullback, very rocky, windswept	7s	---	---	---	---	---
BuE:						
Breakneck, very rocky, windswept	7s	---	---	---	---	---
Pullback, very rocky, windswept	7s	---	---	---	---	---
BuF:						
Breakneck, very rocky, windswept	7s	---	---	---	---	---
Pullback, very rocky, windswept	7s	---	---	---	---	---
ChE:						
Cheoah, stony	6e	---	---	---	---	---

Table 6.—Land Capability and Yields per Acre of Crops and Pasture, Part II—Continued

Map symbol and soil name	Land capability	Alfalfa hay	Cool-season grasses	Orchardgrass hay	Tall fescue hay	Timothy hay
		Tons	Tons	Tons	Tons	Tons
ChF:						
Cheoah, stony	7e	---	---	---	---	---
CrD:						
Cheoah, rocky	4e	---	---	---	---	---
Jeffrey, rocky	6s	---	---	---	---	---
CrE:						
Cheoah, rocky	6e	---	---	---	---	---
Jeffrey, rocky	7s	---	---	---	---	---
CsF:						
Cheoah, very rocky	7s	---	---	---	---	---
Jeffrey, very rocky	7s	---	---	---	---	---
CwA:						
Cullowhee, occasionally flooded	3w	---	2.80	---	4.00	---
Ela, occasionally flooded	6w	---	2.10	---	3.00	---
DAM.						
Dam						
DeB:						
Dellwood, occasionally flooded	3s	---	2.70	---	3.90	---
Reddies, occasionally flooded	2w	---	3.50	---	5.00	---
DrB:						
Dillard, rarely flooded	2w	4.50	3.80	4.90	5.40	4.30
DtD:						
Ditney, very stony	6s	---	---	---	---	---
Unicoi, very stony	7s	---	---	---	---	---
Rock outcrop	8s	---	---	---	---	---
DtE:						
Ditney, very stony	7s	---	---	---	---	---
Unicoi, very stony	7s	---	---	---	---	---
Rock outcrop	8s	---	---	---	---	---
DtF:						
Ditney, very stony	7s	---	---	---	---	---
Unicoi, very stony	7s	---	---	---	---	---
Rock outcrop	8s	---	---	---	---	---

Table 6.—Land Capability and Yields per Acre of Crops and Pasture, Part II—Continued

Map symbol and soil name	Land capability	Alfalfa hay	Cool-season grasses	Orchardgrass hay	Tall fescue hay	Timothy hay
		Tons	Tons	Tons	Tons	Tons
EtA:						
Ela, occasionally flooded	7w	---	2.10	---	3.00	---
Ela, undrained	7w	---	---	---	---	---
FvA:						
Fluvaquents, ponded	8w	---	---	---	---	---
HcD:						
Heintooga, bouldery	6s	---	---	---	---	---
Chiltoskie, bouldery	4c	---	---	---	---	---
HdE:						
Heintooga, very bouldery	7s	---	---	---	---	---
Chiltoskie, very bouldery	7s	---	---	---	---	---
HmA:						
Hemphill, rarely flooded	4w	---	1.40	1.80	2.00	1.60
Hemphill, undrained	6w	---	---	---	---	---
JbC:						
Junaluska	3e	---	2.40	3.00	3.30	2.60
Brasstown	3e	---	2.90	3.70	4.00	3.20
JbD:						
Junaluska	4e	---	2.10	---	2.90	---
Brasstown	4e	---	2.50	---	3.50	---
JbE:						
Junaluska	6e	---	1.60	---	2.30	---
Brasstown	6e	---	2.00	---	2.80	---
JnD:						
Junaluska	6e	---	---	---	---	---
Brasstown	6e	---	---	---	---	---
Urban land	8s	---	---	---	---	---
JtD:						
Junaluska	4e	---	2.10	---	2.90	---
Tsali	6s	---	2.00	---	2.00	---
JtE:						
Junaluska	6e	---	1.60	---	---	---
Tsali	6s	---	---	---	---	---
JtF:						
Junaluska	7e	---	---	---	---	---
Tsali	7s	---	---	---	---	---

Table 6.—Land Capability and Yields per Acre of Crops and Pasture, Part II—Continued

Map symbol and soil name	Land capability	Alfalfa hay	Cool-season grasses	Orchardgrass hay	Tall fescue hay	Timothy hay
		Tons	Tons	Tons	Tons	Tons
LnC:						
Lonon, bouldery	3e	---	3.40	---	---	---
Northcove, bouldery	6s	---	---	---	---	---
LnD:						
Lonon, bouldery	4e	---	2.90	---	---	---
Northcove, bouldery	6s	---	---	---	---	---
LtD:						
Luftee, very rocky, windswept	6s	---	---	---	---	---
Anakeesta, very rocky, windswept	6s	---	---	---	---	---
LtE:						
Luftee, very rocky, windswept	7s	---	---	---	---	---
Anakeesta, very rocky, windswept	7s	---	---	---	---	---
LtF:						
Luftee, very rocky, windswept	7s	---	---	---	---	---
Anakeesta, very rocky, windswept	7s	---	---	---	---	---
NtE:						
Northcove, very bouldery	6s	---	---	---	---	---
Lonon, very bouldery	6s	---	---	---	---	---
RdA:						
Reddies, occasionally flooded	2w	4.50	3.50	4.50	5.00	4.00
SbE:						
Snowbird, stony	6e	---	---	---	---	---
SbF:						
Snowbird, stony	7e	---	---	---	---	---
ScD:						
Soco, stony	4s	---	2.20	---	3.20	---
Stecoah, stony	4e	---	2.60	---	3.60	---
ScE:						
Soco, stony	6s	---	---	---	---	---
Stecoah, stony	6e	---	---	---	---	---
ScF:						
Soco, stony	7s	---	---	---	---	---
Stecoah, stony	7e	---	---	---	---	---

Table 6.—Land Capability and Yields per Acre of Crops and Pasture, Part II—Continued

Map symbol and soil name	Land capability	Alfalfa hay	Cool-season grasses	Orchardgrass hay	Tall fescue hay	Timothy hay
		Tons	Tons	Tons	Tons	Tons
SdD:						
Soco, rocky	4s	---	---	---	---	---
Stecoah, rocky	6e	---	---	---	---	---
SdE:						
Soco, rocky	6s	---	---	---	---	---
Stecoah, rocky	6e	---	---	---	---	---
SdF:						
Soco, rocky	7s	---	---	---	---	---
Stecoah, rocky	7s	---	---	---	---	---
SnD:						
Soco, stony, windswept	6c	---	---	---	---	---
Stecoah, stony, windswept	6c	---	---	---	---	---
SnE:						
Soco, stony, windswept	6s	---	---	---	---	---
Stecoah, stony, windswept	6c	---	---	---	---	---
SpE:						
Spivey, very bouldery	6s	---	---	---	---	---
Santeetlah, very bouldery	6s	---	---	---	---	---
SpF:						
Spivey, very bouldery	7s	---	---	---	---	---
Santeetlah, very bouldery	7s	---	---	---	---	---
SvC:						
Spivey, bouldery	6s	---	---	---	---	---
Whiteoak, bouldery	3e	---	---	---	---	---
SvD:						
Spivey, bouldery	6s	---	---	---	---	---
Whiteoak, bouldery	4e	---	---	---	---	---
SwB:						
Statler, rarely flooded	2e	6.50	3.40	4.40	4.90	3.90
SyD:						
Sylco, very rocky	6s	---	---	---	---	---
Cataska, very rocky	7s	---	---	---	---	---

Table 6.—Land Capability and Yields per Acre of Crops and Pasture, Part II—Continued

Map symbol and soil name	Land capability	Alfalfa hay	Cool-season grasses	Orchardgrass hay	Tall fescue hay	Timothy hay
		Tons	Tons	Tons	Tons	Tons
SyE:						
Sylco, very rocky	7s	---	---	---	---	---
Cataska, very rocky	7s	---	---	---	---	---
SyF:						
Sylco, very rocky	7s	---	---	---	---	---
Cataska, very rocky	7s	---	---	---	---	---
ThB:						
Thurmont	2e	---	3.40	4.30	4.80	3.80
Dillard	2w	4.50	3.80	4.90	5.40	4.30
UdD:						
Udorthents	7e	---	---	---	---	---
Urban land	8s	---	---	---	---	---
UdE:						
Udorthents	7e	---	---	---	---	---
Urban land	8s	---	---	---	---	---
UnB:						
Unison	2e	6.00	3.30	4.30	4.80	3.80
UnC:						
Unison	3e	5.50	2.80	3.60	4.00	3.20
UoA:						
Udorthents, rarely flooded	7e	---	---	---	---	---
Urban land, rarely flooded	8s	---	---	---	---	---
W.						
Water						

Table 7.—Prime and Other Important Farmland

(Only the soils considered prime or other important farmland are listed. Urban or built-up areas of the soils listed are not considered prime or important farmland. If a soil is prime or important farmland only under certain conditions, the conditions are specified in the "Farmland classification" column)

Map symbol	Map unit name	Farmland classification
BkB2	Braddock clay loam, 2 to 8 percent slopes, moderately eroded	All areas are prime farmland
DrB	Dillard loam, 1 to 5 percent slopes, rarely flooded	All areas are prime farmland
RdA	Reddies fine sandy loam, 0 to 3 percent slopes, occasionally flooded	All areas are prime farmland
SwB	Statler loam, 2 to 8 percent slopes, rarely flooded	All areas are prime farmland
ThB	Thurmont-Dillard complex, 2 to 8 percent slopes	All areas are prime farmland
UnB	Unison loam, 2 to 8 percent slopes	All areas are prime farmland
BkD2	Braddock clay loam, 15 to 30 percent slopes, moderately eroded	Farmland of local importance
CwA	Cullowhee-Ela complex, 0 to 3 percent slopes, occasionally flooded	Farmland of local importance
JbD	Junaluska-Brasstown complex, 15 to 30 percent slopes	Farmland of local importance
JtD	Junaluska-Tsali complex, 15 to 30 percent slopes	Farmland of local importance
LnC	Lonon-Northcove complex, 8 to 15 percent slopes, bouldery	Farmland of local importance
LnD	Lonon-Northcove complex, 15 to 30 percent slopes, bouldery	Farmland of local importance
ScD	Soco-Stecoah complex, 15 to 30 percent slopes, stony	Farmland of local importance
BkC2	Braddock clay loam, 8 to 15 percent slopes, moderately eroded	Farmland of statewide importance
DeB	Dellwood-Reddies complex, 0 to 5 percent slopes, occasionally flooded	Farmland of statewide importance
HmA	Hemphill loam, 0 to 3 percent slopes, rarely flooded	Farmland of statewide importance
JbC	Junaluska-Brasstown complex, 8 to 15 percent slopes	Farmland of statewide importance
UnC	Unison loam, 8 to 15 percent slopes	Farmland of statewide importance

Table 8.—Hydric Soils

(This report lists only those map unit components that are rated as hydric. Definitions of hydric criteria codes are included at the end of the report)

Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
AkB:					
Alarka-Wesser complex, 0 to 8 percent slopes, occasionally flooded	Alarka, occasionally flooded	65	Coves, drainageways	Yes	2B3
	Wesser, occasionally flooded	25	Coves, drainageways	Yes	2B3
	Ela, undrained	2	Depressions, flood plains	Yes	2B3
BkB2:					
Braddock clay loam, 2 to 8 percent slopes, moderately eroded	Hemphill	1	Depressions, stream terraces	Yes	2B3
BnC:					
Braddock-Urban land complex, 2 to 15 percent slopes	Hemphill	2	Depressions, stream terraces	Yes	2B3
CwA:					
Cullowhee-Ela complex, 0 to 3 percent slopes, occasionally flooded	Ela, occasionally flooded	40	Depressions, flood plains	Yes	2B3
DeB:					
Dellwood-Reddies complex, 0 to 5 percent slopes, occasionally flooded	Ela, undrained	5	Depressions, flood plains	Yes	2B3
DrB:					
Dillard loam, 1 to 5 percent slopes, rarely flooded	Hemphill	2	Depressions, stream terraces	Yes	2B3
EtA:					
Ela silt loam, 0 to 2 percent slopes, occasionally flooded	Ela, occasionally flooded	80	Depressions, flood plains	Yes	2B3
	Ela, undrained	10	Depressions, flood plains	Yes	2B3
FvA:					
Fluvaquents, ponded, 0 to 3 percent slopes, frequently flooded	Fluvaquents, ponded	90	Depressions, flood plains	Yes	3, 2B3
	Ela, undrained	1	Depressions, flood plains	Yes	2B3
HmA:					
Hemphill loam, 0 to 3 percent slopes, rarely flooded	Hemphill, rarely flooded	75	Depressions, stream terraces	Yes	2B3
	Hemphill, undrained	5	Depressions, stream terraces	Yes	2B3
LnC:					
Lonon-Northcove complex, 8 to 15 percent slopes, bouldery	Nowhere, undrained	3	Coves, drainageways	Yes	2B3
LnD:					
Lonon-Northcove complex, 15 to 30 percent slopes, bouldery	Nowhere, undrained	3	Coves, drainageways	Yes	2B3

Table 8.—Hydric Soils—Continued

Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
NtE: Northcove-Lonon complex, 30 to 50 percent slopes, very bouldery	Nowhere, undrained	1	Coves, drainageways	Yes	2B3
RdA: Reddies fine sandy loam, 0 to 3 percent slopes, occasionally flooded	Ela, undrained	5	Depressions, flood plains	Yes	2B3
SpE: Spivey-Santeetlah complex, 30 to 50 percent slopes, very bouldery	Nowhere, undrained	2	Coves, drainageways	Yes	2B3
SpF: Spivey-Santeetlah complex, 50 to 95 percent slopes, very bouldery	Nowhere, undrained	1	Coves, drainageways	Yes	2B3
SvC: Spivey-Whiteoak complex, 8 to 15 percent slopes, bouldery	Nowhere, undrained	3	Coves, drainageways	Yes	2B3
SvD: Spivey-Whiteoak complex, 15 to 30 percent slopes, bouldery	Nowhere, undrained	3	Coves, drainageways	Yes	2B3
SwB: Statler loam, 2 to 8 percent slopes, rarely flooded	Hemphill, undrained	5	Depressions, stream terraces	Yes	2B3
ThB: Thurmont-Dillard complex, 2 to 8 percent slopes	Ela, undrained	5	Flood plains	Yes	2B3
UnB: Unison loam, 2 to 8 percent slopes	Hemphill, undrained	1	Depressions, stream terraces	Yes	2B3
UnC: Unison loam, 8 to 15 percent slopes	Hemphill, undrained	1	Depressions, stream terraces	Yes	2B3

Explanation of hydric criteria codes:

1. All Histels except for Folistels, and Histosols except for Folists.
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, or Andic, Cumulic, Pachic, or Vitrandic subgroups that:
   - A. are somewhat poorly drained and have a water table at the surface (0.0 feet) during the growing season, or
   - B. are poorly drained or very poorly drained and have either:
     - 1.) a water table at the surface (0.0 feet) during the growing season if textures are coarse sand, sand, or fine sand in all layers within a depth of 20 inches, or
     - 2.) a water table at a depth of 0.5 foot or less during the growing season if permeability is equal to or greater than 6.0 in/hr in all layers within a depth of 20 inches, or
     - 3.) a water table at a depth of 1.0 foot or less during the growing season if permeability is less than 6.0 in/hr in any layer within a depth of 20 inches.
3. Soils that are frequently ponded for long or very long duration during the growing season.
4. Soils that are frequently flooded for long or very long duration during the growing season.

Table 9.—Forestland Productivity

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
AkB:				
Alarka, occasionally flooded	eastern hemlock	---	---	---
	eastern white pine	---	---	
Wesser, occasionally flooded	eastern hemlock	---	---	---
	eastern white pine	---	---	
	red maple	---	---	
	yellow birch	---	---	
BkB2:				
Braddock, moderately eroded	eastern white pine	95	176	eastern white pine
	northern red oak	80	62	
	yellow-poplar	90	90	
BkC2:				
Braddock, moderately eroded	eastern white pine	95	176	eastern white pine
	northern red oak	80	62	
	yellow-poplar	90	90	
BkD2:				
Braddock, moderately eroded	eastern white pine	85	155	eastern white pine
	northern red oak	70	52	
	yellow-poplar	80	71	
BnC.				
Braddock-Urban land				
BuC:				
Breakneck, very rocky, windswept	American beech	---	---	---
	American chestnut	---	---	
	black cherry	---	---	
	eastern hemlock	---	---	
	Fraser fir	---	---	
	northern red oak	---	---	
	red spruce	---	---	
	striped maple	---	---	
	yellow birch	---	---	
Pullback, very rocky, windswept	American beech	---	---	---
	American chestnut	---	---	
	black cherry	---	---	
	eastern hemlock	---	---	
	Fraser fir	---	---	
	northern red oak	---	---	
	red spruce	---	---	
	striped maple	---	---	
	yellow birch	---	---	
	yellow buckeye	---	---	

Table 9.—Forestland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
BuD:				
Breakneck, very rocky, windswept	American beech	---	---	---
	American chestnut	---	---	
	black cherry	---	---	
	eastern hemlock	---	---	
	Fraser fir	---	---	
	northern red oak	---	---	
	red spruce	---	---	
	striped maple	---	---	
	yellow birch	---	---	
Pullback, very rocky, windswept	American beech	---	---	---
	American chestnut	---	---	
	black cherry	---	---	
	eastern hemlock	---	---	
	Fraser fir	---	---	
	northern red oak	---	---	
	red spruce	---	---	
	striped maple	---	---	
	yellow birch	---	---	
	yellow buckeye	---	---	
BuE:				
Breakneck, very rocky, windswept	American beech	---	---	---
	American chestnut	---	---	
	black cherry	---	---	
	eastern hemlock	---	---	
	Fraser fir	---	---	
	northern red oak	---	---	
	red spruce	---	---	
	striped maple	---	---	
	yellow birch	---	---	
Pullback, very rocky, windswept	American beech	---	---	---
	American chestnut	---	---	
	black cherry	---	---	
	eastern hemlock	---	---	
	Fraser fir	---	---	
	northern red oak	---	---	
	red spruce	---	---	
	striped maple	---	---	
	yellow birch	---	---	
	yellow buckeye	---	---	
BuF:				
Breakneck, very rocky, windswept	American beech	---	---	---
	American chestnut	---	---	
	black cherry	---	---	
	eastern hemlock	---	---	
	Fraser fir	---	---	
	northern red oak	---	---	
	red spruce	---	---	
	striped maple	---	---	
	yellow birch	---	---	

Table 9.—Forestland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
BuF:				
Pullback, very rocky, windswept	American beech	---	---	---
	American chestnut	---	---	
	black cherry	---	---	
	eastern hemlock	---	---	
	Fraser fir	---	---	
	northern red oak	---	---	
	red spruce	---	---	
	striped maple	---	---	
	yellow birch	---	---	
	yellow buckeye	---	---	
ChE:				
Cheoah, stony	northern red oak	83	65	yellow-poplar, eastern white pine, northern red oak, black cherry, white ash
	yellow-poplar	103	112	
	American beech	80	---	
	black cherry	74	---	
	eastern hemlock	---	---	
	black oak	---	---	
	yellow birch	---	---	
	sugar maple	---	---	
	red maple	---	---	
	yellow buckeye	---	---	
ChF:				
Cheoah, stony	northern red oak	83	65	yellow-poplar, eastern white pine, northern red oak, black cherry, white ash
	yellow-poplar	103	112	
	American beech	80	---	
	black cherry	74	---	
	eastern hemlock	---	---	
	black oak	---	---	
	yellow birch	---	---	
	sugar maple	---	---	
	red maple	---	---	
	yellow buckeye	---	---	
CrD:				
Cheoah, rocky	northern red oak	84	66	yellow-poplar, eastern white pine, northern red oak, black cherry, white ash
	yellow-poplar	103	112	
	American beech	80	---	
	black cherry	74	---	
	eastern hemlock	---	---	
	black oak	---	---	
	yellow birch	---	---	
	sugar maple	---	---	
	red maple	---	---	
	yellow buckeye	---	---	
Jeffrey, rocky	eastern white pine	70	114	eastern white pine, yellow-poplar, northern red oak
	northern red oak	60	43	
	yellow-poplar	80	72	

Table 9.—Forestland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
CrE:				
Cheoah, rocky	northern red oak	84	66	yellow-poplar, eastern white pine, northern red oak, black cherry, white ash
	yellow-poplar	103	112	
	American beech	80	---	
	black cherry	74	---	
	eastern hemlock	---	---	
	black oak	---	---	
	yellow birch	---	---	
	sugar maple	---	---	
	red maple	---	---	
	yellow buckeye	---	---	
Jeffrey, rocky	eastern white pine	70	114	eastern white pine, yellow-poplar, northern red oak
	northern red oak	60	43	
	yellow-poplar	80	72	
CsF:				
Cheoah, very rocky	northern red oak	84	66	yellow-poplar, eastern white pine, northern red oak, black cherry, white ash
	yellow-poplar	103	112	
	American beech	80	---	
	black cherry	74	---	
	eastern hemlock	---	---	
	black oak	---	---	
	yellow birch	---	---	
	sugar maple	---	---	
	red maple	---	---	
	yellow buckeye	---	---	
Jeffrey, very rocky	eastern white pine	70	114	eastern white pine, yellow-poplar, northern red oak
	northern red oak	60	43	
	yellow-poplar	80	72	
CwA:				
Cullowhee, occasionally flooded	yellow-poplar	103	112	eastern white pine, yellow-poplar
	eastern white pine	100	186	
	American sycamore	---	---	
	red maple	---	---	
	yellow birch	---	---	
	eastern hemlock	---	---	
Ela, occasionally flooded	yellow-poplar	88	86	eastern white pine, yellow-poplar
	eastern white pine	86	157	
	eastern hemlock	---	---	
	American sycamore	---	---	
	red maple	---	---	
	yellow birch	---	---	
	common winterberry	---	---	
DAM.				
Dam				

Table 9.—Forestland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
DeB:				
Dellwood, occasionally flooded	yellow-poplar	100	107	yellow-poplar, eastern white pine
	eastern white pine	91	168	
	red maple	---	---	
	river birch	---	---	
	American sycamore	---	---	
	eastern hemlock	---	---	
Reddies, occasionally flooded	yellow-poplar	105	115	yellow-poplar, eastern white pine
	American sycamore	---	---	
	red maple	---	---	
	eastern white pine	---	---	
	river birch	---	---	
DrB:				
Dillard, rarely flooded	eastern white pine	90	166	eastern white pine, yellow-poplar
	shortleaf pine	75	120	
	Virginia pine	80	112	
	yellow-poplar	95	98	
DtD:				
Ditney, very stony	shortleaf pine	59	86	---
	Virginia pine	58	86	
	pitch pine	---	---	
Unicoi, very stony	pitch pine	40	29	---
	Virginia pine	40	43	
Rock outcrop.				
DtE:				
Ditney, very stony	shortleaf pine	59	86	---
	Virginia pine	58	86	
	pitch pine	---	---	
Unicoi, very stony	pitch pine	40	29	---
	Virginia pine	40	43	
Rock outcrop.				
DtF:				
Ditney, very stony	shortleaf pine	59	86	---
	Virginia pine	58	86	
	pitch pine	---	---	
Unicoi, very stony	pitch pine	40	29	---
	Virginia pine	40	43	
Rock outcrop.				

Table 9.—Forestland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
EtA:				
Ela, occasionally flooded	yellow-poplar	88	86	---
	eastern white pine	86	157	
	eastern hemlock	---	---	
	American sycamore	---	---	
	red maple	---	---	
	yellow birch	---	---	
	common winterberry	---	---	
Ela, undrained	yellow-poplar	88	86	---
	eastern white pine	86	157	
	eastern hemlock	---	---	
	American sycamore	---	---	
	red maple	---	---	
	yellow birch	---	---	
	common winterberry	---	---	
FvA.				
Fluvaquents, ponded				
HcD:				
Heintooga, bouldery	black cherry	---	---	---
	Fraser fir	---	---	
	northern red oak	---	---	
	red spruce	---	---	
	sugar maple	---	---	
	yellow birch	---	---	
	yellow buckeye	---	---	
Chiltoskie, bouldery	black cherry	---	---	---
	Fraser fir	---	---	
	northern red oak	---	---	
	red spruce	---	---	
	sugar maple	---	---	
	yellow birch	---	---	
	yellow buckeye	---	---	
HdE:				
Heintooga, very bouldery	black cherry	---	---	---
	Fraser fir	---	---	
	northern red oak	---	---	
	red spruce	---	---	
	sugar maple	---	---	
	yellow birch	---	---	
	yellow buckeye	---	---	
Chiltoskie, very bouldery	black cherry	---	---	---
	Fraser fir	---	---	
	northern red oak	---	---	
	red spruce	---	---	
	sugar maple	---	---	
	yellow birch	---	---	
	yellow buckeye	---	---	

Table 9.—Forestland Productivity—Continued

Map symbol and soil name	Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
HmA:				
Hemphill, rarely flooded	yellow-poplar	88	86	---
	eastern white pine	84	153	
	American sycamore	---	---	
	red maple	---	---	
	eastern hemlock	---	---	
Hemphill, undrained	yellow-poplar	88	86	---
	eastern white pine	84	153	
	American sycamore	---	---	
	red maple	---	---	
	eastern hemlock	---	---	
JbC:				
Junaluska	scarlet oak	65	48	eastern white pine, shortleaf pine, chestnut oak, scarlet oak, white oak, hickory
	chestnut oak	65	48	
	white oak	61	44	
	shortleaf pine	68	106	
	Virginia pine	74	114	
	eastern white pine	86	157	
	pitch pine	---	---	
	black oak	---	---	
	hickory	---	---	
	black locust	---	---	
Brasstown	scarlet oak	80	62	eastern white pine, shortleaf pine, chestnut oak, scarlet oak, white oak, hickory
	white oak	80	62	
	eastern white pine	91	168	
	shortleaf pine	71	112	
	Virginia pine	74	114	
	pitch pine	---	---	
	black oak	---	---	
	chestnut oak	---	---	
	hickory	---	---	
	black locust	---	---	
JbD:				
Junaluska	scarlet oak	65	48	eastern white pine, shortleaf pine, chestnut oak, scarlet oak, white oak, hickory
	chestnut oak	65	48	
	white oak	61	44	
	shortleaf pine	68	106	
	Virginia pine	74	114	
	eastern white pine	86	157	
	pitch pine	---	---	
	black oak	---	---	
	hickory	---	---	
	black locust	---	---	
Brasstown	scarlet oak	80	62	eastern white pine, shortleaf pine, chestnut oak, scarlet oak, white oak, hickory
	white oak	80	62	
	eastern white pine	91	168	
	shortleaf pine	71	112	
	Virginia pine	74	114	
	pitch pine	---	---	
	black oak	---	---	
	chestnut oak	---	---	
	hickory	---	---	
	black locust	---	---	

Table 9.—Forestland Productivity—Continued

Map symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site index	Volume of wood fiber	
			cu ft/ac	
JbE:				
Junaluska	scarlet oak	65	48	eastern white pine, shortleaf pine, chestnut oak, scarlet oak, white oak, hickory
	chestnut oak	65	48	
	white oak	61	44	
	shortleaf pine	68	106	
	Virginia pine	74	114	
	eastern white pine	86	157	
	pitch pine	---	---	
	black oak	---	---	
	hickory	---	---	
	black locust	---	---	
Brasstown	scarlet oak	80	62	eastern white pine, shortleaf pine, chestnut oak, scarlet oak, white oak, hickory
	white oak	80	62	
	eastern white pine	91	168	
	shortleaf pine	71	112	
	Virginia pine	74	114	
	pitch pine	---	---	
	black oak	---	---	
	chestnut oak	---	---	
	hickory	---	---	
	black locust	---	---	
JnD. Junaluska-Brasstown-Urban land				
JtD:				
Junaluska	scarlet oak	65	48	eastern white pine, shortleaf pine, chestnut oak, scarlet oak, white oak
	chestnut oak	65	48	
	white oak	61	44	
	shortleaf pine	68	106	
	Virginia pine	74	114	
	eastern white pine	86	157	
	pitch pine	---	---	
	black oak	---	---	
	hickory	---	---	
	black locust	---	---	
Tsali	scarlet oak	52	36	shortleaf pine, Virginia pine
	shortleaf pine	60	86	
	Virginia pine	66	100	
	white oak	48	32	
	southern red oak	---	---	
	chestnut oak	---	---	
	black oak	---	---	
	hickory	---	---	
	pitch pine	---	---	
JtE:				
Junaluska	scarlet oak	65	48	eastern white pine, shortleaf pine, chestnut oak, scarlet oak, white oak
	chestnut oak	65	48	
	white oak	61	44	
	shortleaf pine	68	106	
	Virginia pine	74	114	
	eastern white pine	86	157	
	pitch pine	---	---	
	black oak	---	---	
	hickory	---	---	
	black locust	---	---	

Table 9.—Forestland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
JtE:				
Tsali	scarlet oak	52	36	shortleaf pine, Virginia pine
	shortleaf pine	60	86	
	Virginia pine	66	100	
	white oak	48	32	
	southern red oak	---	---	
	chestnut oak	---	---	
	black oak	---	---	
	hickory	---	---	
	pitch pine	---	---	
JtF:				
Junaluska	scarlet oak	65	48	eastern white pine, shortleaf pine, chestnut oak, scarlet oak, white oak
	chestnut oak	65	48	
	white oak	61	44	
	shortleaf pine	68	106	
	Virginia pine	74	114	
	eastern white pine	86	157	
	pitch pine	---	---	
	black oak	---	---	
	hickory	---	---	
	black locust	---	---	
Tsali	scarlet oak	52	36	shortleaf pine, Virginia pine
	shortleaf pine	60	86	
	Virginia pine	66	100	
	white oak	48	32	
	southern red oak	---	---	
	chestnut oak	---	---	
	black oak	---	---	
	hickory	---	---	
	pitch pine	---	---	
LnC:				
Lonon, bouldery	yellow-poplar	74	57	yellow-poplar, eastern white pine, northern red oak, black cherry, white ash
	eastern white pine	86	157	
	northern red oak	---	---	
	white oak	---	---	
	black oak	---	---	
	hickory	---	---	
	red maple	---	---	
	scarlet oak	---	---	
	chestnut oak	---	---	
	pitch pine	---	---	
Northcove, bouldery	yellow-poplar	---	---	yellow-poplar, eastern white pine, northern red oak, black cherry, white ash
	eastern white pine	80	143	
	white oak	---	---	
	eastern hemlock	---	---	
	yellow birch	---	---	
	northern red oak	---	---	
	black cherry	---	---	
	yellow buckeye	---	---	
	sugar maple	---	---	
	American beech	---	---	

Table 9.—Forestland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
LnD:				
Lonon, bouldery	yellow-poplar	74	57	yellow-poplar, eastern white pine, northern red oak, black cherry, white ash
	eastern white pine	86	157	
	northern red oak	---	---	
	white oak	---	---	
	black oak	---	---	
	hickory	---	---	
	red maple	---	---	
	scarlet oak	---	---	
	chestnut oak	---	---	
	pitch pine	---	---	
Northcove, bouldery	yellow-poplar	---	---	yellow-poplar, eastern white pine, northern red oak, black cherry, white ash
	eastern white pine	80	143	
	white oak	---	---	
	eastern hemlock	---	---	
	yellow birch	---	---	
	northern red oak	---	---	
	black cherry	---	---	
	yellow buckeye	---	---	
	sugar maple	---	---	
	American beech	---	---	
LtD:				
Luftee, very rocky, windswept	red spruce	---	---	---
	Fraser fir	---	---	
	northern red oak	---	---	
	black oak	---	---	
	yellow birch	---	---	
	American beech	---	---	
	black cherry	---	---	
	sugar maple	---	---	
	eastern hemlock	---	---	
	yellow buckeye	---	---	
Anakeesta, very rocky, windswept	red spruce	---	---	---
	Fraser fir	---	---	
	northern red oak	---	---	
	black oak	---	---	
	yellow birch	---	---	
	black cherry	---	---	
	American beech	---	---	
	sugar maple	---	---	
	eastern hemlock	---	---	
	yellow buckeye	---	---	
LtE:				
Luftee, very rocky, windswept	red spruce	---	---	---
	Fraser fir	---	---	
	northern red oak	---	---	
	black oak	---	---	
	yellow birch	---	---	
	American beech	---	---	
	black cherry	---	---	
	sugar maple	---	---	
	eastern hemlock	---	---	
	yellow buckeye	---	---	

Table 9.—Forestland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
LtE:				
Anakeesta, very rocky, windswept	red spruce	---	---	---
	Fraser fir	---	---	
	northern red oak	---	---	
	black oak	---	---	
	yellow birch	---	---	
	black cherry	---	---	
	American beech	---	---	
	sugar maple	---	---	
	eastern hemlock	---	---	
	yellow buckeye	---	---	
LtF:				
Luftee, very rocky, windswept	red spruce	---	---	---
	Fraser fir	---	---	
	northern red oak	---	---	
	black oak	---	---	
	yellow birch	---	---	
	American beech	---	---	
	black cherry	---	---	
	sugar maple	---	---	
	eastern hemlock	---	---	
	yellow buckeye	---	---	
Anakeesta, very rocky, windswept	red spruce	---	---	---
	Fraser fir	---	---	
	northern red oak	---	---	
	black oak	---	---	
	yellow birch	---	---	
	black cherry	---	---	
	American beech	---	---	
	sugar maple	---	---	
	eastern hemlock	---	---	
	yellow buckeye	---	---	
NtE:				
Northcove, very bouldery	yellow-poplar	---	---	yellow-poplar, eastern white pine, northern red oak, black cherry, white ash
	eastern white pine	80	143	
	white oak	---	---	
	eastern hemlock	---	---	
	yellow birch	---	---	
	northern red oak	---	---	
	black cherry	---	---	
	yellow buckeye	---	---	
	sugar maple	---	---	
	American beech	---	---	
Lonon, very bouldery	yellow-poplar	74	57	yellow-poplar, eastern white pine, northern red oak, black cherry, white ash
	eastern white pine	86	157	
	northern red oak	---	---	
	white oak	---	---	
	black oak	---	---	
	hickory	---	---	
	red maple	---	---	
	scarlet oak	---	---	
	chestnut oak	---	---	
	pitch pine	---	---	

Table 9.—Forestland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
RdA:				
Reddies, occasionally flooded	yellow-poplar	105	115	yellow-poplar, eastern white pine
	American sycamore	---	---	
	red maple	---	---	
	eastern white pine	---	---	
	river birch	---	---	
SbE:				
Snowbird, stony	yellow-poplar	102	114	yellow-poplar, eastern white pine, northern red oak, black cherry, white ash
	northern red oak	96	72	
	white oak	---	---	
	black cherry	---	---	
	black locust	---	---	
	American basswood	---	---	
	yellow buckeye	---	---	
	hickory	---	---	
	eastern hemlock	---	---	
	sweet birch	---	---	
	American beech	---	---	
	red maple	---	---	
SbF:				
Snowbird, stony	yellow-poplar	102	114	yellow-poplar, eastern white pine, northern red oak, black cherry, white ash
	northern red oak	96	72	
	white oak	---	---	
	black cherry	---	---	
	black locust	---	---	
	American basswood	---	---	
	yellow buckeye	---	---	
	hickory	---	---	
	eastern hemlock	---	---	
	sweet birch	---	---	
	American beech	---	---	
	red maple	---	---	
ScD:				
Soco, stony	eastern white pine	85	155	eastern white pine, shortleaf pine, chestnut oak, scarlet oak, white oak, hickory
	shortleaf pine	61	90	
	pitch pine	---	---	
	Virginia pine	---	---	
	chestnut oak	68	50	
	scarlet oak	76	58	
	white oak	---	---	
	black oak	---	---	
	yellow-poplar	---	---	
Stecoah, stony	eastern white pine	91	168	eastern white pine, shortleaf pine, chestnut oak, scarlet oak, white oak, hickory
	shortleaf pine	68	108	
	scarlet oak	---	---	
	white oak	82	64	
	yellow-poplar	---	---	
	chestnut oak	---	---	
	Virginia pine	---	---	
	hickory	---	---	
	black oak	---	---	
	northern red oak	---	---	

Table 9.—Forestland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber (cu ft/ac)	Trees to manage
ScE:				
Soco, stony	eastern white pine	85	155	eastern white pine, shortleaf pine, chestnut oak, scarlet oak, white oak, hickory
	shortleaf pine	61	90	
	pitch pine	---	---	
	Virginia pine	---	---	
	chestnut oak	68	50	
	scarlet oak	76	58	
	white oak	---	---	
	black oak	---	---	
	yellow-poplar	---	---	
Stecoah, stony	eastern white pine	91	168	eastern white pine, shortleaf pine, chestnut oak, scarlet oak, white oak, hickory
	shortleaf pine	68	108	
	scarlet oak	---	---	
	white oak	82	64	
	yellow-poplar	---	---	
	chestnut oak	---	---	
	Virginia pine	---	---	
	hickory	---	---	
	black oak	---	---	
	northern red oak	---	---	
ScF:				
Soco, stony	eastern white pine	85	155	eastern white pine, shortleaf pine, chestnut oak, scarlet oak, white oak, hickory
	shortleaf pine	61	90	
	pitch pine	---	---	
	Virginia pine	---	---	
	chestnut oak	68	50	
	scarlet oak	76	58	
	white oak	---	---	
	black oak	---	---	
	yellow-poplar	---	---	
ScF:				
Stecoah, stony	eastern white pine	91	168	eastern white pine, shortleaf pine, chestnut oak, scarlet oak, white oak, hickory
	shortleaf pine	68	108	
	scarlet oak	---	---	
	white oak	82	64	
	yellow-poplar	---	---	
	chestnut oak	---	---	
	Virginia pine	---	---	
	hickory	---	---	
	black oak	---	---	
	northern red oak	---	---	
SdD:				
Soco, rocky	eastern white pine	85	155	eastern white pine, shortleaf pine, chestnut oak, scarlet oak, white oak, hickory
	shortleaf pine	61	90	
	pitch pine	---	---	
	Virginia pine	---	---	
	chestnut oak	68	50	
	scarlet oak	76	58	
	white oak	---	---	
	black oak	---	---	
	yellow-poplar	---	---	

Table 9.—Forestland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
SdD:				
Stecoah, rocky	eastern white pine	93	172	eastern white pine, shortleaf pine, chestnut oak, scarlet oak, white oak, hickory
	scarlet oak	---	---	
	white oak	78	60	
	yellow-poplar	---	---	
	chestnut oak	---	---	
	Virginia pine	---	---	
	hickory	---	---	
	black oak	---	---	
	northern red oak	81	63	
SdE:				
Soco, rocky	eastern white pine	85	155	eastern white pine, shortleaf pine, chestnut oak, scarlet oak, white oak, hickory
	shortleaf pine	61	90	
	pitch pine	---	---	
	Virginia pine	---	---	
	chestnut oak	68	50	
	scarlet oak	76	58	
	white oak	---	---	
	black oak	---	---	
	yellow-poplar	---	---	
Stecoah, rocky	eastern white pine	93	172	eastern white pine, shortleaf pine, chestnut oak, scarlet oak, white oak, hickory
	scarlet oak	---	---	
	white oak	78	60	
	yellow-poplar	---	---	
	chestnut oak	---	---	
	Virginia pine	---	---	
	hickory	---	---	
	black oak	---	---	
	northern red oak	81	63	
SdF:				
Soco, rocky	eastern white pine	85	155	eastern white pine, shortleaf pine, chestnut oak, scarlet oak, white oak, hickory
	shortleaf pine	61	90	
	pitch pine	---	---	
	Virginia pine	---	---	
	chestnut oak	68	50	
	scarlet oak	76	58	
	white oak	---	---	
	black oak	---	---	
	yellow-poplar	---	---	
Stecoah, rocky	eastern white pine	93	172	eastern white pine, shortleaf pine, chestnut oak, scarlet oak, white oak, hickory
	scarlet oak	---	---	
	white oak	78	60	
	yellow-poplar	---	---	
	chestnut oak	---	---	
	Virginia pine	---	---	
	hickory	---	---	
	black oak	---	---	
	northern red oak	81	63	
SnD.				
Soco-Stecoah, stony, windswept				

Table 9.—Forestland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
SnE:				
Soco, stony, windswept	chestnut oak	---	---	---
	northern red oak	45	29	
	scarlet oak	---	---	
Stecoah, stony, windswept	chestnut oak	---	---	---
	northern red oak	45	29	
	scarlet oak	---	---	
SpE:				
Spivey, very bouldery	yellow-poplar	109	122	yellow-poplar, eastern white pine, northern red oak, black cherry, white ash
	northern red oak	92	74	
	eastern white pine	---	---	
	eastern hemlock	---	---	
	sugar maple	---	---	
	white oak	---	---	
	yellow birch	---	---	
Santeetlah, very bouldery	yellow-poplar	98	100	yellow-poplar, eastern white pine, northern red oak, black cherry, white ash
	eastern white pine	110	186	
	northern red oak	---	---	
	eastern hemlock	---	---	
	red maple	---	---	
	white oak	---	---	
	scarlet oak	---	---	
	American beech	---	---	
SpF:				
Spivey, very bouldery	yellow-poplar	109	122	yellow-poplar, eastern white pine, northern red oak, black cherry, white ash
	northern red oak	92	74	
	eastern white pine	---	---	
	eastern hemlock	---	---	
	sugar maple	---	---	
	white oak	---	---	
	yellow birch	---	---	
Santeetlah, very bouldery	yellow-poplar	98	100	yellow-poplar, eastern white pine, northern red oak, black cherry, white ash
	eastern white pine	110	186	
	northern red oak	---	---	
	eastern hemlock	---	---	
	red maple	---	---	
	white oak	---	---	
	scarlet oak	---	---	
	American beech	---	---	
SvC:				
Spivey, bouldery	yellow-poplar	109	122	yellow-poplar, eastern white pine, northern red oak, black cherry, white ash
	northern red oak	92	74	
	eastern white pine	---	---	
	eastern hemlock	---	---	
	sugar maple	---	---	
	white oak	---	---	
	yellow birch	---	---	

Table 9.—Forestland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
SvC:				
Whiteoak, bouldery	yellow-poplar	100	107	yellow-poplar, eastern white pine, northern red oak, black cherry, white ash
	eastern white pine	110	206	
	northern red oak	---	---	
	white oak	---	---	
	scarlet oak	---	---	
	American beech	---	---	
	red maple	---	---	
	eastern hemlock	---	---	
SvD:				
Spivey, bouldery	yellow-poplar	109	122	yellow-poplar, eastern white pine, northern red oak, black cherry, white ash
	northern red oak	92	74	
	eastern white pine	---	---	
	eastern hemlock	---	---	
	sugar maple	---	---	
	white oak	---	---	
	yellow birch	---	---	
Whiteoak, bouldery	yellow-poplar	100	107	yellow-poplar, eastern white pine, northern red oak, black cherry, white ash
	eastern white pine	110	206	
	northern red oak	---	---	
	white oak	---	---	
	scarlet oak	---	---	
	American beech	---	---	
	red maple	---	---	
	eastern hemlock	---	---	
SwB:				
Statler, rarely flooded	yellow-poplar	107	119	yellow-poplar, eastern white pine
	white oak	---	---	
	eastern white pine	104	194	
	red maple	---	---	
	northern red oak	---	---	
	hickory	---	---	
SyD:				
Sylco, very rocky	scarlet oak	64	47	---
	shortleaf pine	---	---	
	pitch pine	---	---	
	Virginia pine	---	---	
	chestnut oak	---	---	
	black oak	63	46	
Cataska, very rocky	chestnut oak	40	26	---
	scarlet oak	40	26	
	pitch pine	40	---	
	Virginia pine	---	---	
SyE:				
Sylco, very rocky	scarlet oak	64	47	---
	shortleaf pine	---	---	
	pitch pine	---	---	
	Virginia pine	---	---	
	chestnut oak	---	---	
	black oak	63	46	

Table 9.—Forestland Productivity—Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Volume of wood fiber	Trees to manage
			cu ft/ac	
SyE:				
Cataska, very rocky	chestnut oak	40	26	---
	scarlet oak	40	26	
	pitch pine	40	---	
	Virginia pine	---	---	
SyF:				
Sylco, very rocky	scarlet oak	64	47	---
	shortleaf pine	---	---	
	pitch pine	---	---	
	Virginia pine	---	---	
	chestnut oak	---	---	
	black oak	63	46	
Cataska, very rocky	chestnut oak	40	26	---
	scarlet oak	40	26	
	pitch pine	40	---	
	Virginia pine	---	---	
ThB:				
Thurmont	eastern white pine	88	157	eastern white pine, yellow-poplar
	northern red oak	76	57	
	shortleaf pine	77	129	
	yellow-poplar	88	86	
Dillard	eastern white pine	90	166	eastern white pine, yellow-poplar
	shortleaf pine	75	120	
	Virginia pine	80	112	
	yellow-poplar	95	98	
UdD. Udorthents-Urban land				
UdE. Udorthents-Urban land				
UnB:				
Unison	northern red oak	86	57	yellow-poplar, eastern white pine
	Virginia pine	86	114	
	yellow-poplar	96	100	
UnC:				
Unison	northern red oak	86	57	yellow-poplar, eastern white pine
	Virginia pine	86	114	
	yellow-poplar	96	100	
UoA. Udorthents-Urban land, rarely flooded				
W. Water				

Table 10.—Forestland Management, Part I

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for log landings: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
AkB:							
Alarka, occasionally flooded	65	Severe		Poorly suited		Severe	
		Wetness	1.00	Low strength	1.00	Low strength	1.00
		Low strength	0.50	Slope	0.50	Wetness	0.50
Wesser, occasionally flooded	25	Severe		Poorly suited		Severe	
		Flooding	1.00	Low strength	1.00	Low strength	1.00
		Wetness	1.00	Ponding	1.00	Wetness	0.50
		Sandiness	0.50	Flooding	1.00		
				Wetness	1.00		
BkB2:							
Braddock, moderately eroded	80	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
BkC2:							
Braddock, moderately eroded	80	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
BkD2:							
Braddock, moderately eroded	85	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
		Stickiness/slope	0.50	Low strength	0.50		
BnC:							
Braddock	50	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
Urban land	30	Not rated		Not rated		Not rated	
BuC:							
Breakneck, very rocky, windswept	45	Moderate		Moderately suited		Slight	
		Restrictive layer	0.50	Slope	0.50	Strength	0.10
Pullback, very rocky, windswept	40	Severe		Poorly suited		Severe	
		Low strength	1.00	Low strength	1.00	Low strength	1.00
		Restrictive layer	1.00	Slope	0.50		

Table 10.—Forestland Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for log landings: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
BuD:							
Breakneck, very rocky, windswept	65	Severe		Poorly suited		Slight	
		Restrictive layer	1.00	Slope	1.00	Strength	0.10
		Slope	0.50	Landslides	0.18		
		Landslides	0.18				
Pullback, very rocky, windswept	15	Severe		Poorly suited		Severe	
		Restrictive layer	1.00	Slope	1.00	Low strength	1.00
		Slope	0.50	Low strength	1.00		
		Landslides	0.18	Landslides	0.18		
BuE:							
Breakneck, very rocky, windswept	55	Severe		Poorly suited		Slight	
		Slope	1.00	Slope	1.00	Strength	0.10
		Landslides	0.60	Landslides	0.60		
Pullback, very rocky, windswept	30	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Landslides	0.60	Low strength	1.00		
		Low strength	0.50	Landslides	0.60		
BuF:							
Breakneck, very rocky, windswept	55	Severe		Poorly suited		Slight	
		Slope	1.00	Slope	1.00	Strength	0.10
		Landslides	0.60	Landslides	0.60		
Pullback, very rocky, windswept	30	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Landslides	1.00	Low strength	1.00		
		Low strength	0.50	Landslides	1.00		
ChE:							
Cheoah, stony	80	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Landslides	0.20	Low strength	1.00		
				Landslides	0.20		
ChF:							
Cheoah, stony	80	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Landslides	0.60	Low strength	1.00		
				Landslides	0.60		
CrD:							
Cheoah, rocky	65	Moderate		Poorly suited		Moderate	
		Slope	0.50	Slope	1.00	Low strength	0.50
Jeffrey, rocky	30	Moderate		Poorly suited		Moderate	
		Restrictive layer	0.50	Slope	1.00	Low strength	0.50
		Slope	0.50	Landslides	0.18		
		Landslides	0.18				

Table 10.—Forestland Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for log landings: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
CrE:							
Cheoah, rocky	50	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
		Landslides	0.20	Landslides	0.20		
Jeffrey, rocky	40	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
		Landslides	0.60	Landslides	0.60		
		Low strength	0.50				
CsF:							
Cheoah, very rocky	50	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
		Landslides	0.60	Landslides	0.60		
Jeffrey, very rocky	40	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
		Landslides	0.60	Landslides	0.60		
CwA:							
Cullowhee, occasionally flooded	50	Severe		Poorly suited		Moderate	
		Flooding	1.00	Flooding	1.00	Low strength	0.50
		Wetness	0.50				
Ela, occasionally flooded	40	Severe		Poorly suited		Severe	
		Flooding	1.00	Low strength	1.00	Low strength	1.00
		Low strength	1.00	Ponding	1.00		
		Wetness	1.00	Flooding	1.00		
		Sandiness	0.50	Wetness	1.00		
DAM:							
Dam	100	Not rated		Not rated		Not rated	
DeB:							
Dellwood, occasionally flooded	60	Severe		Poorly suited		Moderate	
		Flooding	1.00	Flooding	1.00	Low strength	0.50
Reddies, occasionally flooded	20	Severe		Poorly suited		Moderate	
		Flooding	1.00	Flooding	1.00	Low strength	0.50
		Sandiness	0.50				
DrB:							
Dillard, rarely flooded	80	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
DtD:							
Ditney, very stony	40	Moderate		Poorly suited		Moderate	
		Restrictive layer	0.50	Slope	1.00	Low strength	0.50
		Slope	0.50	Landslides	0.18		
		Landslides	0.18				

Table 10.—Forestland Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for log landings: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
DtD:							
Unicoi, very stony	35	Severe		Poorly suited		Severe	
		Restrictive layer	1.00	Slope	1.00	Low strength	1.00
		Slope	0.50	Low strength	0.50		
		Landslides	0.18	Landslides	0.18		
Rock outcrop	20	Not rated		Not rated		Not rated	
DtE:							
Ditney, very stony	40	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
		Landslides	0.60	Landslides	0.60		
Unicoi, very stony	35	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
		Landslides	0.60	Landslides	0.60		
Rock outcrop	20	Not rated		Not rated		Not rated	
DtF:							
Ditney, very stony	40	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
		Landslides	0.60	Landslides	0.60		
Unicoi, very stony	35	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
		Landslides	1.00	Landslides	1.00		
Rock outcrop	20	Not rated		Not rated		Not rated	
EtA:							
Ela, occasionally flooded	80	Severe		Poorly suited		Severe	
		Flooding	1.00	Low strength	1.00	Low strength	1.00
		Low strength	1.00	Ponding	1.00		
		Wetness	1.00	Flooding	1.00		
		Sandiness	0.50	Wetness	1.00		
Ela, undrained	10	Severe		Poorly suited		Severe	
		Flooding	1.00	Low strength	1.00	Low strength	1.00
		Low strength	1.00	Ponding	1.00		
		Wetness	1.00	Flooding	1.00		
		Sandiness	0.50	Wetness	1.00		
FvA:							
Fluvaquents, ponded	90	Severe		Poorly suited		Moderate	
		Flooding	1.00	Ponding	1.00	Low strength	0.50
		Wetness	1.00	Flooding	1.00		
				Wetness	1.00		
HcD:							
Heintooga, bouldery	55	Moderate		Poorly suited		Slight	
		Slope	0.50	Slope	1.00	Strength	0.10
		Sandiness	0.50	Landslides	0.18		
		Landslides	0.18				
Chiltoskie, bouldery	35	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
				Low strength	1.00		

Table 10.—Forestland Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for log landings: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
HdE:							
Heintooga, very bouldery	55	Severe		Poorly suited		Slight	
		Slope	1.00	Slope	1.00	Strength	0.10
		Landslides	0.60	Landslides	0.60		
				Rock fragments	0.50		
Chiltoskie, very bouldery	35	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	1.00		
		Landslides	0.20	Rock fragments	0.50		
				Landslides	0.20		
HmA:							
Hemphill, rarely flooded	75	Severe		Poorly suited		Severe	
		Low strength	1.00	Low strength	1.00	Low strength	1.00
		Wetness	1.00	Ponding	1.00		
				Wetness	1.00		
Hemphill, undrained	5	Severe		Poorly suited		Severe	
		Low strength	1.00	Low strength	1.00	Low strength	1.00
		Wetness	1.00	Ponding	1.00		
				Wetness	1.00		
JbC:							
Junaluska	50	Slight		Moderately suited		Moderate	
				Slope	0.50	Low strength	0.50
Brasstown	40	Moderate		Moderately suited		Moderate	
		Low strength	0.50	Slope	0.50	Low strength	0.50
JbD:							
Junaluska	50	Moderate		Poorly suited		Moderate	
		Slope	0.50	Slope	1.00	Low strength	0.50
Brasstown	40	Moderate		Poorly suited		Moderate	
		Slope	0.50	Slope	1.00	Low strength	0.50
JbE:							
Junaluska	50	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
		Landslides	0.20	Landslides	0.20		
Brasstown	40	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
		Low strength	0.50	Landslides	0.20		
		Landslides	0.20				
JnD:							
Junaluska	40	Not rated		Not rated		Not rated	
Brasstown	30	Not rated		Not rated		Not rated	
Urban land	25	Not rated		Not rated		Not rated	

Table 10.—Forestland Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for log landings: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
JtD:							
Junaluska	65	Moderate		Poorly suited		Moderate	
		Slope	0.50	Slope	1.00	Low strength	0.50
Tsali	25	Moderate		Poorly suited		Moderate	
		Slope	0.50	Slope	1.00	Low strength	0.50
		Landslides	0.18	Landslides	0.18		
JtE:							
Junaluska	65	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
		Landslides	0.60	Landslides	0.60		
Tsali	25	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
		Landslides	0.60	Landslides	0.60		
JtF:							
Junaluska	65	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
		Landslides	0.60	Landslides	0.60		
Tsali	25	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
		Landslides	1.00	Landslides	1.00		
LnC:							
Lonon, bouldery	65	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
Northcove, bouldery	20	Severe		Moderately suited		Moderate	
		Stoniness	1.00	Slope	0.50	Low strength	0.50
LnD:							
Lonon, bouldery	65	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
				Low strength	0.50		
Northcove, bouldery	20	Moderate		Poorly suited		Moderate	
		Slope	0.50	Slope	1.00	Low strength	0.50
		Landslides	0.18	Landslides	0.18		
LtD:							
Luftee, very rocky, windswept	55	Moderate		Poorly suited		Slight	
		Restrictive layer	0.50	Slope	1.00	Strength	0.10
		Slope	0.50	Landslides	0.18		
		Landslides	0.18				
Anakeesta, very rocky, windswept	30	Moderate		Poorly suited		Slight	
		Slope	0.50	Slope	1.00	Strength	0.10
		Restrictive layer	0.50	Landslides	0.18		
		Landslides	0.18				

Table 10.—Forestland Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for log landings: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
LtE:							
Luftee, very rocky, windswept----------	55	Severe		Poorly suited		Slight	
		Slope	1.00	Slope	1.00	Strength	0.10
		Landslides	0.60	Landslides	0.60		
Anakeesta, very rocky, windswept---	30	Severe		Poorly suited		Slight	
		Slope	1.00	Slope	1.00	Strength	0.10
		Landslides	0.60	Landslides	0.60		
LtF:							
Luftee, very rocky, windswept----------	55	Severe		Poorly suited		Slight	
		Slope	1.00	Slope	1.00	Strength	0.10
		Landslides	1.00	Landslides	1.00		
Anakeesta, very rocky, windswept---	30	Severe		Poorly suited		Slight	
		Slope	1.00	Slope	1.00	Strength	0.10
		Landslides	1.00	Landslides	1.00		
NtE:							
Northcove, very bouldery-----------	55	Severe		Poorly suited		Slight	
		Slope	1.00	Slope	1.00	Strength	0.10
		Landslides	0.60	Landslides	0.60		
				Rock fragments	0.50		
Lonon, very bouldery	40	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Low strength	0.50	Rock fragments	0.50		
		Landslides	0.20	Low strength	0.50		
				Landslides	0.20		
RdA:							
Reddies, occasionally flooded------------	80	Severe		Poorly suited		Moderate	
		Flooding	1.00	Flooding	1.00	Low strength	0.50
		Sandiness	0.50				
SbE:							
Snowbird, stony-----	80	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
		Landslides	0.20	Landslides	0.20		
SbF:							
Snowbird, stony-----	80	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Landslides	0.60	Landslides	0.60		
		Low strength	0.50	Low strength	0.50		
ScD:							
Soco, stony---------	50	Moderate		Poorly suited		Moderate	
		Slope	0.50	Slope	1.00	Low strength	0.50
Stecoah, stony------	40	Moderate		Poorly suited		Moderate	
		Slope	0.50	Slope	1.00	Low strength	0.50

Table 10.—Forestland Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for log landings: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
ScE:							
Soco, stony	45	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
		Landslides	0.20	Landslides	0.20		
Stecoah, stony	35	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
		Landslides	0.20	Landslides	0.20		
ScF:							
Soco, stony	45	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
		Landslides	0.60	Landslides	0.60		
Stecoah, stony	35	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Landslides	0.60	Landslides	0.60		
		Low strength	0.50	Low strength	0.50		
SdD:							
Soco, rocky	50	Moderate		Poorly suited		Moderate	
		Slope	0.50	Slope	1.00	Low strength	0.50
Stecoah, rocky	35	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
				Low strength	0.50		
SdE:							
Soco, rocky	45	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
		Landslides	0.20	Landslides	0.20		
Stecoah, rocky	35	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
		Landslides	0.20	Landslides	0.20		
SdF:							
Soco, rocky	45	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
		Landslides	0.60	Landslides	0.60		
Stecoah, rocky	35	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
		Landslides	0.60	Landslides	0.60		
SnD:							
Soco, stony, windswept	50	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
				Low strength	0.50		
Stecoah, stony, windswept	40	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
				Low strength	0.50		

Table 10.—Forestland Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for log landings: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
SnE:							
Soco, stony, windswept	55	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Landslides	0.20	Low strength	0.50		
				Landslides	0.20		
Stecoah, stony, windswept	35	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Landslides	0.20	Low strength	0.50		
				Landslides	0.20		
SpE:							
Spivey, very bouldery	50	Severe		Poorly suited		Slight	
		Slope	1.00	Slope	1.00	Strength	0.10
		Landslides	0.60	Landslides	0.60		
		Low strength	0.50	Rock fragments	0.50		
Santeetlah, very bouldery	40	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Low strength	0.50	Low strength	1.00		
		Landslides	0.20	Rock fragments	0.50		
				Landslides	0.20		
SpF:							
Spivey, very bouldery	50	Severe		Poorly suited		Slight	
		Slope	1.00	Slope	1.00	Strength	0.10
		Landslides	1.00	Landslides	1.00		
		Low strength	0.50	Rock fragments	0.50		
Santeetlah, very bouldery	40	Severe		Poorly suited		Severe	
		Slope	1.00	Slope	1.00	Low strength	1.00
		Landslides	0.60	Low strength	1.00		
		Low strength	0.50	Landslides	0.60		
				Rock fragments	0.50		
SvC:							
Spivey, bouldery	50	Severe		Moderately suited		Slight	
		Stoniness	1.00	Slope	0.50	Strength	0.10
Whiteoak, bouldery	40	Moderate		Moderately suited		Severe	
		Low strength	0.50	Slope	0.50	Low strength	1.00
				Low strength	0.50		
SvD:							
Spivey, bouldery	50	Moderate		Poorly suited		Slight	
		Slope	0.50	Slope	1.00	Strength	0.10
		Landslides	0.18	Landslides	0.18		
Whiteoak, bouldery	40	Moderate		Poorly suited		Severe	
		Slope	0.50	Slope	1.00	Low strength	1.00
				Low strength	0.50		

Table 10.—Forestland Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for log landings: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
SwB:							
Statler, rarely flooded	90	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
SyD:							
Sylco, very rocky	60	Severe		Poorly suited		Slight	
		Restrictive layer	1.00	Slope	1.00	Strength	0.10
		Slope	0.50	Landslides	0.18		
		Landslides	0.18				
Cataska, very rocky	30	Severe		Poorly suited		Slight	
		Restrictive layer	1.00	Slope	1.00	Strength	0.10
		Slope	0.50	Landslides	0.18		
		Landslides	0.18				
SyE:							
Sylco, very rocky	45	Severe		Poorly suited		Slight	
		Slope	1.00	Slope	1.00	Strength	0.10
		Landslides	0.60	Landslides	0.60		
		Low strength	0.50				
Cataska, very rocky	35	Severe		Poorly suited		Slight	
		Slope	1.00	Slope	1.00	Strength	0.10
		Landslides	0.60	Landslides	0.60		
		Low strength	0.50				
SyF:							
Sylco, very rocky	50	Severe		Poorly suited		Slight	
		Slope	1.00	Slope	1.00	Strength	0.10
		Landslides	1.00	Landslides	1.00		
		Low strength	0.50				
Cataska, very rocky	35	Severe		Poorly suited		Slight	
		Slope	1.00	Slope	1.00	Strength	0.10
		Landslides	1.00	Landslides	1.00		
		Low strength	0.50				
ThB:							
Thurmont	55	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
Dillard	35	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
UdD:							
Udorthents	50	Slight		Moderately suited		Moderate	
				Slope	0.50	Low strength	0.50
Urban land	40	Not rated		Not rated		Not rated	
UdE:							
Udorthents	45	Severe		Poorly suited		Moderate	
		Slope	1.00	Slope	1.00	Low strength	0.50
		Landslides	1.00	Landslides	1.00		
Urban land	35	Not rated		Not rated		Not rated	

Table 10.—Forestland Management, Part I—Continued

Map symbol and soil name	Pct. of map unit	Limitations affecting construction of haul roads and log landings: Rating class and limiting features	Value	Suitability for log landings: Rating class and limiting features	Value	Soil rutting hazard: Rating class and limiting features	Value
UnB:							
Unison	90	Moderate		Moderately suited		Severe	
		Low strength	0.50	Low strength	0.50	Low strength	1.00
		Stickiness/slope	0.50				
UnC:							
Unison	80	Moderate		Moderately suited		Severe	
		Stickiness/slope	0.50	Slope	0.50	Low strength	1.00
		Low strength	0.50	Low strength	0.50		
UoA:							
Udorthents, rarely flooded	60	Slight		Well suited		Moderate	
						Low strength	0.50
Urban land, rarely flooded	30	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	

Table 10.—Forestland Management, Part II

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
AkB:							
Alarka, occasionally flooded	65	Slight		Moderate		Poorly suited	
				Slope/erodibility	0.50	Low strength	1.00
						Slope	0.50
Wesser, occasionally flooded	25	Slight		Slight		Poorly suited	
						Low strength	1.00
						Ponding	1.00
						Flooding	1.00
						Wetness	1.00
BkB2:							
Braddock, moderately eroded	80	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
BkC2:							
Braddock, moderately eroded	80	Slight		Severe		Moderately suited	
				Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
BkD2:							
Braddock, moderately eroded	85	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
BnC:							
Braddock	50	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50
						Low strength	0.50
Urban land	30	Not rated		Not rated		Not rated	
BuC:							
Breakneck, very rocky, windswept	45	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50
Pullback, very rocky, windswept	40	Slight		Moderate		Poorly suited	
				Slope/erodibility	0.50	Low strength	1.00
						Slope	0.50
BuD:							
Breakneck, very rocky, windswept	65	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.18

Table 10.—Forestland Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
BuD:							
Pullback, very rocky, windswept	15	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	1.00
						Landslides	0.18
BuE:							
Breakneck, very rocky, windswept	55	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.60
Pullback, very rocky, windswept	30	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Low strength	1.00
						Landslides	0.60
BuF:							
Breakneck, very rocky, windswept	55	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.60
Pullback, very rocky, windswept	30	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Low strength	1.00
						Landslides	1.00
ChE:							
Cheoah, stony	80	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Low strength	1.00
						Landslides	0.20
ChF:							
Cheoah, stony	80	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Low strength	1.00
						Landslides	0.60
CrD:							
Cheoah, rocky	65	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
Jeffrey, rocky	30	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.18
CrE:							
Cheoah, rocky	50	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.20
Jeffrey, rocky	40	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.60

Table 10.—Forestland Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
CsF:							
Cheoah, very rocky	50	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.60
Jeffrey, very rocky	40	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.60
CwA:							
Cullowhee, occasionally flooded	50	Slight		Slight		Poorly suited	
						Flooding	1.00
Ela, occasionally flooded	40	Slight		Slight		Poorly suited	
						Low strength	1.00
						Ponding	1.00
						Flooding	1.00
						Wetness	1.00
DAM:							
Dam	100	Not rated		Not rated		Not rated	
DeB:							
Dellwood, occasionally flooded	60	Slight		Slight		Poorly suited	
						Flooding	1.00
Reddies, occasionally flooded	20	Slight		Slight		Poorly suited	
						Flooding	1.00
DrB:							
Dillard, rarely flooded	80	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
DtD:							
Ditney, very stony	40	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.18
Unicoi, very stony	35	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
						Landslides	0.18
Rock outcrop	20	Not rated		Not rated		Not rated	
DtE:							
Ditney, very stony	40	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.60

Table 10.—Forestland Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
DtE:							
Unicoi, very stony	35	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.60
Rock outcrop	20	Not rated		Not rated		Not rated	
DtF:							
Ditney, very stony	40	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.60
Unicoi, very stony	35	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Landslides	1.00
Rock outcrop	20	Not rated		Not rated		Not rated	
EtA:							
Ela, occasionally flooded	80	Slight		Slight		Poorly suited	
						Low strength	1.00
						Ponding	1.00
						Flooding	1.00
						Wetness	1.00
Ela, undrained	10	Slight		Slight		Poorly suited	
						Low strength	1.00
						Ponding	1.00
						Flooding	1.00
						Wetness	1.00
FvA:							
Fluvaquents, ponded	90	Slight		Slight		Poorly suited	
						Ponding	1.00
						Flooding	1.00
						Wetness	1.00
HcD:							
Heintooga, bouldery	55	Moderate		Moderate		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.50	Slope	1.00
						Landslides	0.18
Chiltoskie, bouldery	35	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	1.00
HdE:							
Heintooga, very bouldery	55	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.60
						Rock fragments	0.50
Chiltoskie, very bouldery	35	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Low strength	1.00
						Rock fragments	0.50
						Landslides	0.20

Table 10.—Forestland Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
HmA:							
Hemphill, rarely flooded	75	Slight		Slight		Poorly suited	
						Low strength	1.00
						Ponding	1.00
						Wetness	1.00
Hemphill, undrained	5	Slight		Slight		Poorly suited	
						Low strength	1.00
						Ponding	1.00
						Wetness	1.00
JbC:							
Junaluska	50	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50
Brasstown	40	Slight		Severe		Moderately suited	
				Slope/erodibility	0.95	Slope	0.50
JbD:							
Junaluska	50	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
Brasstown	40	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
JbE:							
Junaluska	50	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.20
Brasstown	40	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.20
JnD:							
Junaluska	40	Not rated		Not rated		Not rated	
Brasstown	30	Not rated		Not rated		Not rated	
Urban land	25	Not rated		Not rated		Not rated	
JtD:							
Junaluska	65	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
Tsali	25	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.18
JtE:							
Junaluska	65	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.60
Tsali	25	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.60

Table 10.—Forestland Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
JtF:							
Junaluska-----------	65	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.60
Tsali---------------	25	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Landslides	1.00
LnC:							
Lonon, bouldery-----	65	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50
						Low strength	0.50
Northcove, bouldery-	20	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50
LnD:							
Lonon, bouldery-----	65	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
Northcove, bouldery-	20	Moderate		Moderate		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.50	Slope	1.00
						Landslides	0.18
LtD:							
Luftee, very rocky, windswept----------	55	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.18
Anakeesta, very rocky, windswept---	30	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.18
LtE:							
Luftee, very rocky, windswept----------	55	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.60
Anakeesta, very rocky, windswept---	30	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.60
LtF:							
Luftee, very rocky, windswept----------	55	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Landslides	1.00
Anakeesta, very rocky, windswept---	30	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Landslides	1.00

Table 10.—Forestland Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
NtE:							
Northcove, very bouldery	55	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.60
						Rock fragments	0.50
Lonon, very bouldery	40	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Rock fragments	0.50
						Low strength	0.50
						Landslides	0.20
RdA:							
Reddies, occasionally flooded	80	Slight		Slight		Poorly suited	
						Flooding	1.00
SbE:							
Snowbird, stony	80	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
						Landslides	0.20
SbF:							
Snowbird, stony	80	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.60
						Low strength	0.50
ScD:							
Soco, stony	50	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
Stecoah, stony	40	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
ScE:							
Soco, stony	45	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.20
Stecoah, stony	35	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.20
ScF:							
Soco, stony	45	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.60
Stecoah, stony	35	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.60
						Low strength	0.50

Table 10.—Forestland Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
SdD:							
Soco, rocky	50	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
Stecoah, rocky	35	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
SdE:							
Soco, rocky	45	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.20
Stecoah, rocky	35	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
						Landslides	0.20
SdF:							
Soco, rocky	45	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.60
Stecoah, rocky	35	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.60
SnD:							
Soco, stony, windswept	50	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
Stecoah, stony, windswept	40	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
SnE:							
Soco, stony, windswept	55	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
						Landslides	0.20
Stecoah, stony, windswept	35	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
						Landslides	0.20
SpE:							
Spivey, very bouldery	50	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.60
						Rock fragments	0.50

Table 10.—Forestland Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
SpE:							
Santeetlah, very bouldery	40	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Low strength	1.00
						Rock fragments	0.50
						Landslides	0.20
SpF:							
Spivey, very bouldery	50	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Landslides	1.00
						Rock fragments	0.50
Santeetlah, very bouldery	40	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Low strength	1.00
						Landslides	0.60
						Rock fragments	0.50
SvC:							
Spivey, bouldery	50	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50
Whiteoak, bouldery	40	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50
						Low strength	0.50
SvD:							
Spivey, bouldery	50	Moderate		Moderate		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.50	Slope	1.00
						Landslides	0.18
Whiteoak, bouldery	40	Moderate		Moderate		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.50	Slope	1.00
						Low strength	0.50
SwB:							
Statler, rarely flooded	90	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
SyD:							
Sylco, very rocky	60	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.18
Cataska, very rocky	30	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.18
SyE:							
Sylco, very rocky	45	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.60
Cataska, very rocky	35	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Landslides	0.60

Table 10.—Forestland Management, Part II—Continued

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion: Rating class and limiting features	Value	Hazard of erosion on roads and trails: Rating class and limiting features	Value	Suitability for roads (natural surface): Rating class and limiting features	Value
SyF:							
Sylco, very rocky	50	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Landslides	1.00
Cataska, very rocky	35	Very severe		Severe		Poorly suited	
		Slope/erodibility	0.95	Slope/erodibility	0.95	Slope	1.00
						Landslides	1.00
ThB:							
Thurmont	55	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
Dillard	35	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
UdD:							
Udorthents	50	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Slope	0.50
Urban land	40	Not rated		Not rated		Not rated	
UdE:							
Udorthents	45	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Landslides	1.00
Urban land	35	Not rated		Not rated		Not rated	
UnB:							
Unison	90	Slight		Moderate		Moderately suited	
				Slope/erodibility	0.50	Low strength	0.50
UnC:							
Unison	80	Slight		Severe		Moderately suited	
				Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
UoA:							
Udorthents, rarely flooded	60	Slight		Slight		Well suited	
Urban land, rarely flooded	30	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	

Table 10.—Forestland Management, Part III

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
AkB:							
Alarka, occasionally flooded	65	Moderately suited		Poorly suited		Poorly suited	
		Wetness	0.50	Wetness	0.75	Low strength	1.00
				Slope	0.50	Wetness	1.00
Wesser, occasionally flooded	25	Poorly suited		Poorly suited		Poorly suited	
		Wetness	0.75	Wetness	0.75	Low strength	1.00
						Wetness	1.00
BkB2:							
Braddock, moderately eroded	80	Poorly suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75	Low strength	0.50
				Slope	0.50		
BkC2:							
Braddock, moderately eroded	80	Poorly suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75	Low strength	0.50
				Slope	0.50		
BkD2:							
Braddock, moderately eroded	85	Poorly suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.75	Slope	0.75	Low strength	0.50
				Stickiness; high plasticity index	0.75	Slope	0.50
BnC:							
Braddock	50	Poorly suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75	Low strength	0.50
				Slope	0.50		
Urban land	30	Not rated		Not rated		Not rated	
BuC:							
Breakneck, very rocky, windswept	45	Well suited		Moderately suited		Well suited	
				Slope	0.50		
				Rock fragments	0.50		
Pullback, very rocky, windswept	40	Well suited		Moderately suited		Poorly suited	
				Slope	0.50	Low strength	1.00
				Rock fragments	0.50		

Table 10.—Forestland Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
BuD:							
Breakneck, very rocky, windswept	65	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Slope	0.50
				Rock fragments	0.50		
Pullback, very rocky, windswept	15	Well suited		Poorly suited		Poorly suited	
				Slope	0.75	Low strength	1.00
				Rock fragments	0.50	Slope	0.50
BuE:							
Breakneck, very rocky, windswept	55	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50		
Pullback, very rocky, windswept	30	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Low strength	1.00
				Rock fragments	0.50	Slope	1.00
BuF:							
Breakneck, very rocky, windswept	55	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50		
Pullback, very rocky, windswept	30	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50	Low strength	1.00
ChE:							
Cheoah, stony	80	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Low strength	1.00
				Rock fragments	0.50	Slope	1.00
ChF:							
Cheoah, stony	80	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50	Low strength	1.00
CrD:							
Cheoah, rocky	65	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Slope	0.50
				Rock fragments	0.50		
Jeffrey, rocky	30	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Slope	0.50
				Rock fragments	0.50		
CrE:							
Cheoah, rocky	50	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50		
Jeffrey, rocky	40	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50		

Table 10.—Forestland Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
CsF:							
Cheoah, very rocky	50	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50		
Jeffrey, very rocky	40	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50		
CwA:							
Cullowhee, occasionally flooded	50	Well suited		Well suited		Moderately suited	
						Wetness	0.50
Ela, occasionally Flooded	40	Poorly suited		Poorly suited		Poorly suited	
		Wetness	0.75	Wetness	0.75	Low strength	1.00
						Wetness	1.00
DAM:							
Dam	100	Not rated		Not rated		Not rated	
DeB:							
Dellwood, occasionally flooded	60	Well suited		Moderately suited		Well suited	
				Rock fragments	0.50		
Reddies, occasionally flooded	20	Well suited		Well suited		Well suited	
DrB:							
Dillard, rarely flooded	80	Moderately suited		Moderately suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Stickiness; high plasticity index	0.50	Low strength	0.50
DtD:							
Ditney, very stony	40	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Slope	0.50
				Rock fragments	0.50		
Unicoi, very stony	35	Moderately suited		Poorly suited		Moderately suited	
		Rock fragments	0.50	Slope	0.75	Low strength	0.50
				Rock fragments	0.75	Slope	0.50
Rock outcrop	20	Not rated		Not rated		Not rated	
DtE:							
Ditney, very stony	40	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50		
Unicoi, very stony	35	Moderately suited		Unsuited		Poorly suited	
		Rock fragments	0.50	Slope	1.00	Slope	1.00
		Slope	0.50	Rock fragments	0.75		
Rock outcrop	20	Not rated		Not rated		Not rated	

Table 10.—Forestland Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
DtF:							
Ditney, very stony	40	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50		
Unicoi, very stony	35	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.75		
Rock outcrop	20	Not rated		Not rated		Not rated	
EtA:							
Ela, occasionally flooded	80	Poorly suited		Poorly suited		Poorly suited	
		Wetness	0.75	Wetness	0.75	Low strength	1.00
				Rock fragments	0.50	Wetness	1.00
Ela, undrained	10	Poorly suited		Poorly suited		Poorly suited	
		Wetness	0.75	Wetness	0.75	Low strength	1.00
				Rock fragments	0.50	Wetness	1.00
FvA:							
Fluvaquents, ponded	90	Poorly suited		Poorly suited		Poorly suited	
		Wetness	0.75	Wetness	0.75	Wetness	1.00
HcD:							
Heintooga, bouldery	55	Moderately suited		Poorly suited		Moderately suited	
		Rock fragments	0.50	Slope	0.75	Slope	0.50
				Rock fragments	0.75		
Chiltoskie, bouldery	35	Well suited		Poorly suited		Poorly suited	
				Slope	0.75	Low strength	1.00
						Slope	0.50
HdE:							
Heintooga, very bouldery	55	Moderately suited		Unsuited		Poorly suited	
		Rock fragments	0.50	Slope	1.00	Slope	1.00
		Slope	0.50	Rock fragments	0.75	Rock fragments	0.50
Chiltoskie, very bouldery	35	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Low strength	1.00
				Rock fragments	0.50	Slope	1.00
						Rock fragments	0.50
HmA:							
Hemphill, rarely flooded	75	Poorly suited		Poorly suited		Poorly suited	
		Wetness	0.75	Wetness	0.75	Low strength	1.00
		Stickiness; high plasticity index	0.50	Stickiness; high plasticity index	0.50	Wetness	1.00
Hemphill, undrained	5	Poorly suited		Poorly suited		Poorly suited	
		Wetness	0.75	Wetness	0.75	Low strength	1.00
		Stickiness; high plasticity index	0.50	Stickiness; high plasticity index	0.50	Wetness	1.00

Table 10.—Forestland Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
JbC:							
Junaluska	50	Well suited		Moderately suited		Well suited	
				Slope	0.50		
				Rock fragments	0.50		
Brasstown	40	Well suited		Moderately suited		Well suited	
				Slope	0.50		
				Rock fragments	0.50		
JbD:							
Junaluska	50	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Slope	0.50
Brasstown	40	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Slope	0.50
				Rock fragments	0.50		
JbE:							
Junaluska	50	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
Brasstown	40	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50		
JnD:							
Junaluska	40	Not rated		Not rated		Not rated	
Brasstown	30	Not rated		Not rated		Not rated	
Urban land	25	Not rated		Not rated		Not rated	
JtD:							
Junaluska	65	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Slope	0.50
Tsali	25	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Slope	0.50
				Rock fragments	0.50		
JtE:							
Junaluska	65	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
Tsali	25	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50		
JtF:							
Junaluska	65	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
Tsali	25	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50		

Table 10.—Forestland Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
LnC:							
Lonon, bouldery-----	65	Moderately suited		Moderately suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Slope	0.50	Low strength	0.50
				Stickiness; high plasticity index	0.50		
				Rock fragments	0.50		
Northcove, bouldery-	20	Moderately suited		Moderately suited		Well suited	
		Rock fragments	0.50	Rock fragments	0.50		
				Slope	0.50		
LnD:							
Lonon, bouldery-----	65	Moderately suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.50	Slope	0.75	Low strength	0.50
				Stickiness; high plasticity index	0.50	Slope	0.50
				Rock fragments	0.50		
Northcove, bouldery-	20	Moderately suited		Poorly suited		Moderately suited	
		Rock fragments	0.50	Slope	0.75	Slope	0.50
				Rock fragments	0.50		
LtD:							
Luftee, very rocky, windswept----------	55	Moderately suited		Unsuited		Moderately suited	
		Rock fragments	0.50	Rock fragments	1.00	Slope	0.50
				Slope	0.75		
Anakeesta, very rocky, windswept---	30	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Slope	0.50
				Rock fragments	0.50		
LtE:							
Luftee, very rocky, windswept----------	55	Moderately suited		Unsuited		Poorly suited	
		Rock fragments	0.50	Slope	1.00	Slope	1.00
		Slope	0.50	Rock fragments	1.00		
Anakeesta, very rocky, windswept---	30	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50		
LtF:							
Luftee, very rocky, windswept----------	55	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	1.00		
Anakeesta, very rocky, windswept---	30	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50		
NtE:							
Northcove, very bouldery-----------	55	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.75	Rock fragments	0.50

Table 10.—Forestland Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
NtE:							
Lonon, very bouldery	40	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
		Stickiness; high plasticity index	0.50	Rock fragments	0.50	Rock fragments	0.50
				Stickiness; high plasticity index	0.50	Low strength	0.50
RdA:							
Reddies, occasionally flooded	80	Well suited		Well suited		Well suited	
SbE:							
Snowbird, stony	80	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
						Low strength	0.50
SbF:							
Snowbird, stony	80	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
						Low strength	0.50
ScD:							
Soco, stony	50	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Slope	0.50
				Rock fragments	0.50		
Stecoah, stony	40	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Slope	0.50
				Rock fragments	0.50		
ScE:							
Soco, stony	45	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50		
Stecoah, stony	35	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50		
ScF:							
Soco, stony	45	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50		
Stecoah, stony	35	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50	Low strength	0.50
SdD:							
Soco, rocky	50	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Slope	0.50
				Rock fragments	0.50		
Stecoah, rocky	35	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Low strength	0.50
				Rock fragments	0.50	Slope	0.50

Table 10.—Forestland Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
SdE:							
Soco, rocky	45	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50		
Stecoah, rocky	35	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50	Low strength	0.50
SdF:							
Soco, rocky	45	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50		
Stecoah, rocky	35	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50		
SnD:							
Soco, stony, windswept	50	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Low strength	0.50
				Rock fragments	0.50	Slope	0.50
Stecoah, stony, windswept	40	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Low strength	0.50
				Rock fragments	0.50	Slope	0.50
SnE:							
Soco, stony, windswept	55	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50	Low strength	0.50
Stecoah, stony, windswept	35	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50	Low strength	0.50
SpE:							
Spivey, very bouldery	50	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.75	Rock fragments	0.50
Santeetlah, very bouldery	40	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Low strength	1.00
				Rock fragments	0.50	Slope	1.00
						Rock fragments	0.50
SpF:							
Spivey, very bouldery	50	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.75	Rock fragments	0.50

Table 10.—Forestland Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
SpF:							
Santeetlah, very bouldery----------	40	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50	Low strength	1.00
						Rock fragments	0.50
SvC:							
Spivey, bouldery----	50	Moderately suited		Poorly suited		Well suited	
		Rock fragments	0.50	Rock fragments	0.75		
				Slope	0.50		
Whiteoak, bouldery--	40	Well suited		Moderately suited		Moderately suited	
				Slope	0.50	Low strength	0.50
SvD:							
Spivey, bouldery----	50	Moderately suited		Poorly suited		Moderately suited	
		Rock fragments	0.50	Slope	0.75	Slope	0.50
				Rock fragments	0.75		
Whiteoak, bouldery--	40	Well suited		Poorly suited		Moderately suited	
				Slope	0.75	Low strength	0.50
						Slope	0.50
SwB:							
Statler, rarely flooded-----------	90	Well suited		Moderately suited		Moderately suited	
				Slope	0.50	Low strength	0.50
SyD:							
Sylco, very rocky---	60	Moderately suited		Poorly suited		Moderately suited	
		Rock fragments	0.50	Slope	0.75	Slope	0.50
				Rock fragments	0.50		
Cataska, very rocky-	30	Moderately suited		Poorly suited		Moderately suited	
		Rock fragments	0.50	Slope	0.75	Slope	0.50
				Rock fragments	0.50		
SyE:							
Sylco, very rocky---	45	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.50		
Cataska, very rocky-	35	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.50		
SyF:							
Sylco, very rocky---	50	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.50		
Cataska, very rocky-	35	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.50		

Table 10.—Forestland Management, Part III—Continued

Map symbol and soil name	Pct. of map unit	Suitability for hand planting: Rating class and limiting features	Value	Suitability for mechanical planting: Rating class and limiting features	Value	Suitability for use of harvesting equipment: Rating class and limiting features	Value
ThB:							
Thurmont	55	Well suited		Moderately suited		Moderately suited	
				Slope	0.50	Low strength	0.50
Dillard	35	Well suited		Well suited		Moderately suited	
						Low strength	0.50
UdD:							
Udorthents	50	Well suited		Moderately suited		Well suited	
				Slope	0.50		
				Rock fragments	0.50		
Urban land	40	Not rated		Not rated		Not rated	
UdE:							
Udorthents	45	Moderately suited		Unsuited		Poorly suited	
		Slope	0.50	Slope	1.00	Slope	1.00
				Rock fragments	0.50		
Urban land	35	Not rated		Not rated		Not rated	
UnB:							
Unison	90	Poorly suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75	Low strength	0.50
				Slope	0.50		
UnC:							
Unison	80	Poorly suited		Poorly suited		Moderately suited	
		Stickiness; high plasticity index	0.75	Stickiness; high plasticity index	0.75	Low strength	0.50
				Slope	0.50		
UoA:							
Udorthents, rarely flooded	60	Well suited		Moderately suited		Well suited	
				Rock fragments	0.50		
Urban land, rarely flooded	30	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	

Table 10.—Forestland Management, Part IV

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value
AkB:					
Alarka, occasionally flooded	65	Poorly suited		Unsuited	
		Wetness	0.50	Wetness	1.00
Wesser, occasionally flooded	25	Poorly suited		Unsuited	
		Wetness	0.75	Wetness	1.00
BkB2:					
Braddock, moderately eroded	80	Poorly suited		Well suited	
		Stickiness; high plasticity index	0.50		
BkC2:					
Braddock, moderately eroded	80	Poorly suited		Well suited	
		Stickiness; high plasticity index	0.50		
BkD2:					
Braddock, moderately eroded	85	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
		Stickiness; high plasticity index	0.50		
BnC:					
Braddock	50	Poorly suited		Well suited	
		Stickiness; high plasticity index	0.50		
Urban land	30	Not rated		Not rated	
BuC:					
Breakneck, very rocky, windswept	45	Well suited		Unsuited	
				Restrictive layer	1.00
Pullback, very rocky, windswept	40	Well suited		Unsuited	
				Restrictive layer	1.00
BuD:					
Breakneck, very rocky, windswept	65	Poorly suited		Unsuited	
		Slope	0.50	Restrictive layer	1.00
				Slope	0.50

Table 10.—Forestland Management, Part IV—Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value
BuD:					
Pullback, very rocky, windswept	15	Poorly suited		Unsuited	
		Slope	0.50	Restrictive layer	1.00
				Slope	0.50
BuE:					
Breakneck, very rocky, windswept	55	Unsuited		Unsuited	
		Slope	1.00	Restrictive layer	1.00
				Slope	1.00
Pullback, very rocky, windswept	30	Unsuited		Unsuited	
		Slope	1.00	Restrictive layer	1.00
				Slope	1.00
BuF:					
Breakneck, very rocky, windswept	55	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
				Restrictive layer	1.00
Pullback, very rocky, windswept	30	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
				Restrictive layer	1.00
ChE:					
Cheoah, stony	80	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
ChF:					
Cheoah, stony	80	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
CrD:					
Cheoah, rocky	65	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
Jeffrey, rocky	30	Poorly suited		Unsuited	
		Slope	0.50	Restrictive layer	1.00
				Slope	0.50
CrE:					
Cheoah, rocky	50	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
Jeffrey, rocky	40	Unsuited		Unsuited	
		Slope	1.00	Restrictive layer	1.00
				Slope	1.00
CsF:					
Cheoah, very rocky	50	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
Jeffrey, very rocky	40	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
				Restrictive layer	1.00

Table 10.—Forestland Management, Part IV—Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value
CwA:					
Cullowhee, occasionally flooded	50	Well suited		Unsuited	
				Wetness	1.00
Ela, occasionally flooded	40	Poorly suited		Unsuited	
		Wetness	0.75	Wetness	1.00
DAM:					
Dam	100	Not rated		Not rated	
DeB:					
Dellwood, occasionally flooded	60	Well suited		Well suited	
Reddies, occasionally flooded	20	Well suited		Well suited	
DrB:					
Dillard, rarely flooded	80	Well suited		Well suited	
DtD:					
Ditney, very stony	40	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
				Restrictive layer	0.50
Unicoi, very stony	35	Poorly suited		Unsuited	
		Slope	0.50	Restrictive layer	1.00
		Rock fragments	0.50	Slope	0.50
Rock outcrop	20	Not rated		Not rated	
DtE:					
Ditney, very stony	40	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
				Restrictive layer	0.50
Unicoi, very stony	35	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Restrictive layer	1.00
Rock outcrop	20	Not rated		Not rated	
DtF:					
Ditney, very stony	40	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
				Restrictive layer	0.50
Unicoi, very stony	35	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Restrictive layer	1.00
Rock outcrop	20	Not rated		Not rated	

Table 10.—Forestland Management, Part IV—Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value
EtA:					
Ela, occasionally flooded	80	Poorly suited		Unsuited	
		Wetness	0.75	Wetness	1.00
Ela, undrained	10	Poorly suited		Unsuited	
		Wetness	0.75	Wetness	1.00
FvA:					
Fluvaquents, ponded	90	Poorly suited		Unsuited	
		Wetness	0.75	Wetness	1.00
HcD:					
Heintooga, bouldery	55	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
		Rock fragments	0.50	Rock fragments	0.50
Chiltoskie, bouldery	35	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
HdE:					
Heintooga, very bouldery	55	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Rock fragments	0.50
Chiltoskie, very bouldery	35	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50		
HmA:					
Hemphill, rarely flooded	75	Poorly suited		Unsuited	
		Wetness	0.75	Wetness	1.00
Hemphill, undrained	5	Poorly suited		Unsuited	
		Wetness	0.75	Wetness	1.00
JbC:					
Junaluska	50	Well suited		Well suited	
Brasstown	40	Well suited		Well suited	
JbD:					
Junaluska	50	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
Brasstown	40	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
JbE:					
Junaluska	50	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
Brasstown	40	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00

Table 10.—Forestland Management, Part IV—Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value
JnD:					
Junaluska	40	Not rated		Not rated	
Brasstown	30	Not rated		Not rated	
Urban land	25	Not rated		Not rated	
JtD:					
Junaluska	65	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
Tsali	25	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
JtE:					
Junaluska	65	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
Tsali	25	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
JtF:					
Junaluska	65	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
Tsali	25	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
LnC:					
Lonon, bouldery	65	Well suited		Well suited	
Northcove, bouldery	20	Poorly suited		Well suited	
		Rock fragments	0.50		
LnD:					
Lonon, bouldery	65	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
Northcove, bouldery	20	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
		Rock fragments	0.50		
LtD:					
Luftee, very rocky, windswept	55	Poorly suited		Unsuited	
		Slope	0.50	Restrictive layer	1.00
		Rock fragments	0.50	Slope	0.50
Anakeesta, very rocky, windswept	30	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
LtE:					
Luftee, very rocky, windswept	55	Unsuited		Unsuited	
		Slope	1.00	Restrictive layer	1.00
		Rock fragments	0.50	Slope	1.00

Table 10.—Forestland Management, Part IV—Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value
LtE:					
Anakeesta, very rocky, windswept	30	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
LtF:					
Luftee, very rocky, windswept	55	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Restrictive layer	1.00
Anakeesta, very rocky, windswept	30	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
NtE:					
Northcove, very bouldery	55	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50		
Lonon, very bouldery	40	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50		
RdA:					
Reddies, occasionally flooded	80	Well suited		Well suited	
SbE:					
Snowbird, stony	80	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
SbF:					
Snowbird, stony	80	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
ScD:					
Soco, stony	50	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
Stecoah, stony	40	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
ScE:					
Soco, stony	45	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
Stecoah, stony	35	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
ScF:					
Soco, stony	45	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
Stecoah, stony	35	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00

Table 10.—Forestland Management, Part IV—Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value
SdD:					
Soco, rocky	50	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
Stecoah, rocky	35	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
SdE:					
Soco, rocky	45	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
Stecoah, rocky	35	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
SdF:					
Soco, rocky	45	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
Stecoah, rocky	35	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
SnD:					
Soco, stony, windswept	50	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
Stecoah, stony, windswept	40	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
SnE:					
Soco, stony, windswept	55	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
Stecoah, stony, windswept	35	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
SpE:					
Spivey, very bouldery	50	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50		
Santeetlah, very bouldery	40	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50		
SpF:					
Spivey, very bouldery	50	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50		
Santeetlah, very bouldery	40	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50		

Table 10.—Forestland Management, Part IV—Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value
SvC:					
Spivey, bouldery	50	Poorly suited		Well suited	
		Rock fragments	0.50		
Whiteoak, bouldery	40	Well suited		Well suited	
SvD:					
Spivey, bouldery	50	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
		Rock fragments	0.50		
Whiteoak, bouldery	40	Poorly suited		Poorly suited	
		Slope	0.50	Slope	0.50
SwB:					
Statler, rarely flooded	90	Well suited		Well suited	
SyD:					
Sylco, very rocky	60	Poorly suited		Unsuited	
		Slope	0.50	Restrictive layer	1.00
		Rock fragments	0.50	Slope	0.50
Cataska, very rocky	30	Poorly suited		Unsuited	
		Slope	0.50	Restrictive layer	1.00
		Rock fragments	0.50	Slope	0.50
SyE:					
Sylco, very rocky	45	Unsuited		Unsuited	
		Slope	1.00	Restrictive layer	1.00
		Rock fragments	0.50	Slope	1.00
Cataska, very rocky	35	Unsuited		Unsuited	
		Slope	1.00	Restrictive layer	1.00
		Rock fragments	0.50	Slope	1.00
SyF:					
Sylco, very rocky	50	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Restrictive layer	1.00
Cataska, very rocky	35	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
		Rock fragments	0.50	Restrictive layer	1.00
ThB:					
Thurmont	55	Well suited		Well suited	
Dillard	35	Well suited		Well suited	
UdD:					
Udorthents	50	Well suited		Well suited	
Urban land	40	Not rated		Not rated	

Table 10.—Forestland Management, Part IV—Continued

Map symbol and soil name	Pct. of map unit	Suitability for mechanical site preparation (surface): Rating class and limiting features	Value	Suitability for mechanical site preparation (deep): Rating class and limiting features	Value
UdE:					
Udorthents----------	45	Unsuited		Unsuited	
		Slope	1.00	Slope	1.00
Urban land----------	35	Not rated		Not rated	
UnB:					
Unison--------------	90	Poorly suited		Well suited	
		Stickiness; high plasticity index	0.50		
UnC:					
Unison--------------	80	Poorly suited		Well suited	
		Stickiness; high plasticity index	0.50		
UoA:					
Udorthents, rarely flooded------------	60	Well suited		Well suited	
Urban land, rarely flooded------------	30	Not rated		Not rated	
W:					
Water---------------	100	Not rated		Not rated	

Table 10.—Forestland Management, Part V

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
AkB:					
Alarka, occasionally flooded	65	Moderate		High	
		Texture/surface depth/rock fragments	0.50	Wetness	1.00
				Soil reaction	1.00
Wesser, occasionally flooded	25	Moderate		High	
		Texture/surface depth/rock fragments	0.50	Wetness	1.00
				Soil reaction	1.00
BkB2:					
Braddock, moderately eroded	80	Low		Low	
BkC2:					
Braddock, moderately eroded	80	Low		Low	
BkD2:					
Braddock, moderately eroded	85	Low		Low	
BnC:					
Braddock	50	Low		Low	
Urban land	30	Not rated		Not rated	
BuC:					
Breakneck, very rocky, windswept	45	Low		Moderate	
		Texture/rock fragments	0.10	Soil reaction	0.50
Pullback, very rocky, windswept	40	Low		Moderate	
		Texture/rock fragments	0.10	Soil reaction	0.50
BuD:					
Breakneck, very rocky, windswept	65	Low		Moderate	
		Texture/rock fragments	0.10	Soil reaction	0.50
Pullback, very rocky, windswept	15	Low		Moderate	
		Texture/rock fragments	0.10	Soil reaction	0.50

Table 10.—Forestland Management, Part V—Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
BuE:					
Breakneck, very rocky, windswept	55	Low		Moderate	
		Texture/rock fragments	0.10	Soil reaction	0.50
Pullback, very rocky, windswept	30	Low		Moderate	
		Texture/slope/ rock fragments	0.10	Soil reaction	0.50
BuF:					
Breakneck, very rocky, windswept	55	Low		Moderate	
		Texture/rock fragments	0.10	Soil reaction	0.50
Pullback, very rocky, windswept	30	Low		Moderate	
		Texture/slope/ rock fragments	0.10	Soil reaction	0.50
ChE:					
Cheoah, stony	80	Low		Low	
		Texture/rock fragments	0.10		
ChF:					
Cheoah, stony	80	Low		Low	
		Texture/rock fragments	0.10		
CrD:					
Cheoah, rocky	65	Low		Low	
		Texture/rock fragments	0.10		
Jeffrey, rocky	30	Low		Low	
		Texture/rock fragments	0.10		
CrE:					
Cheoah, rocky	50	Low		Low	
		Texture/rock fragments	0.10		
Jeffrey, rocky	40	Low		Low	
		Texture/slope/ rock fragments	0.10		
CsF:					
Cheoah, very rocky	50	Low		Low	
		Texture/rock fragments	0.10		
Jeffrey, very rocky	40	Low		Low	
		Texture/slope/ rock fragments	0.10		

Table 10.—Forestland Management, Part V—Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
CwA:					
Cullowhee, occasionally flooded	50	Low		Low	
		Texture/rock fragments	0.10		
Ela, occasionally flooded	40	Low		High	
		Texture/rock fragments	0.10	Wetness	1.00
DAM:					
Dam	100	Not rated		Not rated	
DeB:					
Dellwood, occasionally flooded	60	Low		Low	
		Texture/rock fragments	0.10		
Reddies, occasionally flooded	20	Low		Low	
		Texture/rock fragments	0.10		
DrB:					
Dillard, rarely flooded	80	Low		Low	
		Texture/rock fragments	0.10		
DtD:					
Ditney, very stony	40	Low		Moderate	
		Texture/rock fragments	0.10	Available water	0.50
Unicoi, very stony	35	Low		Moderate	
		Texture/rock fragments	0.10	Available water	0.50
Rock outcrop	20	Not rated		Not rated	
DtE:					
Ditney, very stony	40	Low		Moderate	
				Available water	0.50
Unicoi, very stony	35	Moderate		Moderate	
		Texture/slope/ surface depth/ rock fragments	0.50	Available water	0.50
Rock outcrop	20	Not rated		Not rated	
DtF:					
Ditney, very stony	40	Low		Moderate	
				Available water	0.50

Table 10.—Forestland Management, Part V—Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
DtF:					
Unicoi, very stony	35	Low		Moderate	
				Available water	0.50
Rock outcrop	20	Not rated		Not rated	
EtA:					
Ela, occasionally flooded	80	Low		High	
		Texture/rock fragments	0.10	Wetness	1.00
Ela, undrained	10	Low		High	
		Texture/rock fragments	0.10	Wetness	1.00
FvA:					
Fluvaquents, ponded	90	Moderate		High	
		Texture/rock fragments	0.50	Wetness	1.00
HcD:					
Heintooga, bouldery	55	Low		Moderate	
		Texture/rock fragments	0.10	Soil reaction	0.50
Chiltoskie, bouldery	35	Low		Moderate	
		Texture/rock fragments	0.10	Soil reaction	0.50
HdE:					
Heintooga, very bouldery	55	Low		Moderate	
		Texture/rock fragments	0.10	Soil reaction	0.50
Chiltoskie, very bouldery	35	Low		Moderate	
		Texture/slope/ rock fragments	0.10	Soil reaction	0.50
HmA:					
Hemphill, rarely flooded	75	Low		High	
		Texture/rock fragments	0.10	Wetness	1.00
Hemphill, undrained	5	Low		High	
		Texture/rock fragments	0.10	Wetness	1.00
JbC:					
Junaluska	50	Low		Low	
		Texture/rock fragments	0.10		
Brasstown	40	Low		Low	
		Texture/rock fragments	0.10		

Table 10.—Forestland Management, Part V—Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
JbD:					
Junaluska	50	Moderate		Moderate	
		Texture/surface depth/rock fragments	0.50	Available water	0.50
Brasstown	40	Low		Moderate	
		Texture/rock fragments	0.10	Available water	0.50
JbE:					
Junaluska	50	Moderate		Moderate	
		Texture/slope/ surface depth/ rock fragments	0.50	Available water	0.50
Brasstown	40	Low		Moderate	
				Available water	0.50
JnD:					
Junaluska	40	Not rated		Not rated	
Brasstown	30	Not rated		Not rated	
Urban land	25	Not rated		Not rated	
JtD:					
Junaluska	65	Low		Moderate	
		Texture/rock fragments	0.10	Available water	0.50
Tsali	25	Low		Moderate	
		Texture/rock fragments	0.10	Available water	0.50
JtE:					
Junaluska	65	Low		Moderate	
				Available water	0.50
Tsali	25	Low		Moderate	
				Available water	0.50
JtF:					
Junaluska	65	Low		Moderate	
				Available water	0.50
Tsali	25	Low		Moderate	
				Available water	0.50
LnC:					
Lonon, bouldery	65	Low		Low	
		Texture/rock fragments	0.10		
Northcove, bouldery	20	Low		Low	
		Texture/rock fragments	0.10		

Table 10.—Forestland Management, Part V—Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
LnD:					
Lonon, bouldery	65	Low		Low	
		Texture/rock fragments	0.10		
Northcove, bouldery	20	Low		Low	
		Texture/rock fragments	0.10		
LtD:					
Luftee, very rocky, windswept	55	Low		Moderate	
		Texture/rock fragments	0.10	Soil reaction	0.50
Anakeesta, very rocky, windswept	30	Low		Moderate	
		Texture/rock fragments	0.10	Soil reaction	0.50
LtE:					
Luftee, very rocky, windswept	55	Low		Moderate	
		Texture/rock fragments	0.10	Soil reaction	0.50
Anakeesta, very rocky, windswept	30	Low		Moderate	
		Texture/rock fragments	0.10	Soil reaction	0.50
LtF:					
Luftee, very rocky, windswept	55	Low		Moderate	
		Texture/rock fragments	0.10	Soil reaction	0.50
Anakeesta, very rocky, windswept	30	Low		Moderate	
		Texture/rock fragments	0.10	Soil reaction	0.50
NtE:					
Northcove, very bouldery	55	Moderate		Low	
		Texture/slope/ rock fragments	0.50		
Lonon, very bouldery	40	Low		Low	
		Texture/slope/ rock fragments	0.10		
RdA:					
Reddies, occasionally flooded	80	Low		Low	
		Texture/rock fragments	0.10		

Table 10.—Forestland Management, Part V—Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
SbE:					
Snowbird, stony	80	Low		Low	
		Texture/slope/ rock fragments	0.10		
SbF:					
Snowbird, stony	80	Low		Low	
		Texture/slope/ rock fragments	0.10		
ScD:					
Soco, stony	50	Low		Moderate	
		Texture/rock fragments	0.10	Available water	0.50
Stecoah, stony	40	Low		Moderate	
		Texture/rock fragments	0.10	Available water	0.50
ScE:					
Soco, stony	45	Low		Moderate	
				Available water	0.50
Stecoah, stony	35	Low		Moderate	
				Available water	0.50
ScF:					
Soco, stony	45	Low		Moderate	
				Available water	0.50
Stecoah, stony	35	Low		Moderate	
				Available water	0.50
SdD:					
Soco, rocky	50	Low		Moderate	
		Texture/rock fragments	0.10	Available water	0.50
Stecoah, rocky	35	Low		Moderate	
		Texture/rock fragments	0.10	Available water	0.50
SdE:					
Soco, rocky	45	Low		Moderate	
				Available water	0.50
Stecoah, rocky	35	Low		Moderate	
				Available water	0.50
SdF:					
Soco, rocky	45	Low		Moderate	
				Available water	0.50
Stecoah, rocky	35	Low		Moderate	
				Available water	0.50

Table 10.—Forestland Management, Part V—Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
SnD:					
Soco, stony, windswept	50	Moderate		Low	
		Texture/surface depth/rock fragments	0.50		
Stecoah, stony, windswept	40	Low		Low	
		Texture/rock fragments	0.10		
SnE:					
Soco, stony, windswept	55	Moderate		Moderate	
		Texture/slope/ surface depth/ rock fragments	0.50	Available water	0.50
Stecoah, stony, windswept	35	Low		Moderate	
				Available water	0.50
SpE:					
Spivey, very bouldery	50	Low		Low	
		Texture/rock fragments	0.10		
Santeetlah, very bouldery	40	Low		Low	
		Texture/rock fragments	0.10		
SpF:					
Spivey, very bouldery	50	Low		Low	
		Texture/rock fragments	0.10		
Santeetlah, very bouldery	40	Low		Low	
		Texture/rock fragments	0.10		
SvC:					
Spivey, bouldery	50	Low		Low	
		Texture/rock fragments	0.10		
Whiteoak, bouldery	40	Low		Low	
		Texture/rock fragments	0.10		
SvD:					
Spivey, bouldery	50	Low		Low	
		Texture/rock fragments	0.10		

Table 10.—Forestland Management, Part V—Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
SvD:					
Whiteoak, bouldery	40	Low		Low	
		Texture/rock fragments	0.10		
SwB:					
Statler, rarely flooded	90	Low		Low	
		Texture/rock fragments	0.10		
SyD:					
Sylco, very rocky	60	Moderate		Moderate	
		Texture/surface depth/rock fragments	0.50	Available water	0.50
Cataska, very rocky	30	Moderate		Moderate	
		Texture/surface depth/rock fragments	0.50	Available water	0.50
SyE:					
Sylco, very rocky	45	High		Moderate	
		Texture/slope/ surface depth/ rock fragments	1.00	Available water	0.50
Cataska, very rocky	35	High		Moderate	
		Texture/slope/ surface depth/ rock fragments	1.00	Available water	0.50
SyF:					
Sylco, very rocky	50	High		Moderate	
		Texture/slope/ surface depth/ rock fragments	1.00	Available water	0.50
Cataska, very rocky	35	High		Moderate	
		Texture/slope/ surface depth/ rock fragments	1.00	Available water	0.50
ThB:					
Thurmont	55	Low		Low	
		Texture/surface depth/rock fragments	0.10		
Dillard	35	Low		Low	
		Texture/rock fragments	0.10		
UdD:					
Udorthents	50	Moderate		Low	
		Texture/rock fragments	0.50		
Urban land	40	Not rated		Not rated	

Table 10.—Forestland Management, Part V—Continued

Map symbol and soil name	Pct. of map unit	Potential for damage to soil by fire: Rating class and limiting features	Value	Potential for seedling mortality: Rating class and limiting features	Value
UdE:					
Udorthents	45	Moderate		Low	
		Texture/rock fragments	0.50		
Urban land	35	Not rated		Not rated	
UnB:					
Unison	90	Low		Low	
		Texture/rock fragments	0.10		
UnC:					
Unison	80	Low		Low	
		Texture/rock fragments	0.10		
UoA:					
Udorthents, rarely flooded	60	Moderate		Low	
		Texture/rock fragments	0.50		
Urban land, rarely flooded	30	Not rated		Not rated	
W:					
Water	100	Not rated		Not rated	

Table 11.—Recreation, Part I

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
AkB:							
Alarka, occasionally flooded	65	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Slow water movement	0.26	Slope	1.00
		Slow water movement	0.26			Slow water movement	0.26
Wesser, occasionally flooded	25	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00			Flooding	0.60
BkB2:							
Braddock, moderately eroded	80	Not limited		Not limited		Somewhat limited	
						Slope	0.88
						Gravel	0.21
BkC2:							
Braddock, moderately eroded	80	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
						Gravel	0.21
BkD2:							
Braddock, moderately eroded	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel	0.21
BnC:							
Braddock	50	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.04	Slope	0.04	Slope	1.00
						Gravel	0.84
Urban land	30	Not rated		Not rated		Not rated	
BuC:							
Breakneck, very rocky, windswept	45	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
						Gravel	0.95
						Depth to bedrock	0.65
Pullback, very rocky, windswept	40	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Slope	1.00
		Slope	0.63	Slope	0.63	Depth to bedrock	1.00

Table 11.—Recreation, Part I—Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
BuD:							
Breakneck, very rocky, windswept	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel	0.95
						Depth to bedrock	0.65
Pullback, very rocky, windswept	15	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
BuE:							
Breakneck, very rocky, windswept	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.47	Large stones content	0.47	Gravel	0.95
						Depth to bedrock	0.65
						Large stones content	0.47
Pullback, very rocky, windswept	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Large stones content	0.47	Large stones content	0.47	Large stones content	0.47
BuF:							
Breakneck, very rocky, windswept	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.47	Large stones content	0.47	Gravel	0.95
						Depth to bedrock	0.65
						Large stones content	0.47
Pullback, very rocky, windswept	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Large stones content	0.47	Large stones content	0.47	Large stones content	0.47
ChE:							
Cheoah, stony	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel	0.02
ChF:							
Cheoah, stony	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel	0.02
CrD:							
Cheoah, rocky	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Jeffrey, rocky	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.29
						Gravel	0.25

Table 11.—Recreation, Part I—Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
CrE:							
Cheoah, rocky	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Jeffrey, rocky	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.29
						Gravel	0.25
CsF:							
Cheoah, very rocky	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.53	Large stones content	0.53	Large stones content	0.53
Jeffrey, very rocky	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.53	Large stones content	0.53	Large stones content	0.53
						Gravel	0.25
						Depth to bedrock	0.16
CwA:							
Cullowhee, occasionally flooded	50	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	0.43	Depth to saturated zone	0.77
		Depth to saturated zone	0.77			Flooding	0.60
						Gravel	0.32
Ela, occasionally flooded	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00			Flooding	0.60
						Gravel	0.32
DAM:							
Dam	100	Not rated		Not rated		Not rated	
DeB:							
Dellwood, occasionally flooded	60	Very limited		Somewhat limited		Very limited	
		Flooding	1.00	Gravel	0.14	Gravel	1.00
		Gravel	0.14			Flooding	0.60
						Slope	0.12
Reddies, occasionally flooded	20	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
						Gravel	0.27
						Slope	0.12

Table 11.—Recreation, Part I—Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
DrB:							
Dillard, rarely flooded	80	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Slope	0.12
DtD:							
Ditney, very stony	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.53	Large stones content	0.53	Large stones content	0.53
						Depth to bedrock	0.46
						Gravel	0.10
Unicoi, very stony	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Large stones content	0.53	Large stones content	0.53	Large stones content	0.53
						Gravel	0.01
Rock outcrop	20	Not rated		Not rated		Not rated	
DtE:							
Ditney, very stony	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.53	Large stones content	0.53	Large stones content	0.53
						Depth to bedrock	0.46
						Gravel	0.10
Unicoi, very stony	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Large stones content	0.53	Large stones content	0.53	Large stones content	0.53
						Gravel	0.04
Rock outcrop	20	Not rated		Not rated		Not rated	
DtF:							
Ditney, very stony	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.53	Large stones content	0.53	Large stones content	0.53
						Depth to bedrock	0.46
						Gravel	0.10
Unicoi, very stony	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Large stones content	0.53	Large stones content	0.53	Large stones content	0.53
						Gravel	0.03
Rock outcrop	20	Not rated		Not rated		Not rated	

Table 11.—Recreation, Part I—Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
EtA:							
Ela, occasionally flooded	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00			Flooding	0.60
Ela, undrained	10	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00			Flooding	0.60
FvA:							
Fluvaquents, ponded	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Ponding	1.00	Flooding	0.40	Ponding	1.00
		Slow water movement	0.26	Slow water movement	0.26	Slow water movement	0.26
HcD:							
Heintooga, bouldery	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.61	Large stones content	0.61	Gravel	0.83
						Large stones content	0.61
Chiltoskie, bouldery	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
HdE:							
Heintooga, very bouldery	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.61	Large stones content	0.61	Gravel	0.83
						Large stones content	0.61
Chiltoskie, very bouldery	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.47	Large stones content	0.47	Large stones content	0.47
HmA:							
Hemphill, rarely flooded	75	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Slow water movement	0.96	Slow water movement	0.96
		Slow water movement	0.96				

Table 11.—Recreation, Part I—Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
HmA:							
Hemphill, undrained	5	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Slow water movement	0.96	Slow water movement	0.96
		Slow water movement	0.96				
JbC:							
Junaluska	50	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
						Depth to bedrock	0.06
Brasstown	40	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
						Gravel	0.88
JbD:							
Junaluska	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.80
Brasstown	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel	0.88
JbE:							
Junaluska	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.80
Brasstown	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel	0.88
JnD:							
Junaluska	40	Not rated		Not rated		Not rated	
Brasstown	30	Not rated		Not rated		Not rated	
Urban land	25	Not rated		Not rated		Not rated	
JtD:							
Junaluska	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.06
Tsali	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
						Gravel	0.25
JtE:							
Junaluska	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.06
Tsali	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
						Gravel	0.25

Table 11.—Recreation, Part I—Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
JtF:							
Junaluska	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.06
Tsali	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
						Gravel	0.25
LnC:							
Lonon, bouldery	65	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
						Gravel	0.08
Northcove, bouldery	20	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Large stones content	0.06	Large stones content	0.06	Gravel	0.87
						Large stones content	0.06
LnD:							
Lonon, bouldery	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel	0.08
Northcove, bouldery	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.06	Large stones content	0.06	Gravel	0.87
						Large stones content	0.06
LtD:							
Luftee, very rocky, windswept	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.53	Large stones content	0.53	Gravel	1.00
		Gravel	0.52	Gravel	0.52	Large stones content	0.53
						Depth to bedrock	0.16
Anakeesta, very rocky, windswept	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.53	Large stones content	0.53	Gravel	1.00
		Gravel	0.18	Gravel	0.18	Large stones content	0.53
LtE:							
Luftee, very rocky, windswept	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.53	Large stones content	0.53	Gravel	1.00
		Gravel	0.52	Gravel	0.52	Large stones content	0.53
						Depth to bedrock	0.16

Table 11.—Recreation, Part I—Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
LtE:							
Anakeesta, very rocky, windswept	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.53	Large stones content	0.53	Gravel	1.00
		Gravel	0.18	Gravel	0.18	Large stones content	0.53
LtF:							
Luftee, very rocky, windswept	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.53	Large stones content	0.53	Gravel	1.00
		Gravel	0.52	Gravel	0.52	Large stones content	0.53
						Depth to bedrock	0.16
Anakeesta, very rocky, windswept	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.53	Large stones content	0.53	Gravel	1.00
		Gravel	0.18	Gravel	0.18	Large stones content	0.53
NtE:							
Northcove, very bouldery	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.47	Large stones content	0.47	Large stones content	0.47
						Gravel	0.44
Lonon, very bouldery	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.47	Large stones content	0.47	Large stones content	0.47
						Gravel	0.08
RdA:							
Reddies, occasionally flooded	80	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
						Gravel	0.01
SbE:							
Snowbird, stony	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
SbF:							
Snowbird, stony	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
ScD:							
Soco, stony	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel	0.25
						Depth to bedrock	0.10

Table 11.—Recreation, Part I—Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
ScD:							
Stecoah, stony	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel	0.02
ScE:							
Soco, stony	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel	0.25
						Depth to bedrock	0.10
Stecoah, stony	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel	0.02
ScF:							
Soco, stony	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel	0.21
						Depth to bedrock	0.10
Stecoah, stony	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel	0.02
SdD:							
Soco, rocky	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel	0.21
						Depth to bedrock	0.10
Stecoah, rocky	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel	0.01
SdE:							
Soco, rocky	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel	0.21
						Depth to bedrock	0.10
Stecoah, rocky	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel	0.01
SdF:							
Soco, rocky	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel	0.25
						Depth to bedrock	0.10
Stecoah, rocky	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel	0.02
SnD:							
Soco, stony, windswept	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.95
						Gravel	0.02

Table 11.—Recreation, Part I—Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Value	Picnic areas: Rating class and limiting features	Value	Playgrounds: Rating class and limiting features	Value
SnD:							
Stecoah, stony, windswept	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel	0.05
SnE:							
Soco, stony, windswept	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.95
						Gravel	0.02
Stecoah, stony, windswept	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel	0.05
SpE:							
Spivey, very bouldery	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.47	Large stones content	0.47	Large stones content	0.47
						Gravel	0.15
Santeetlah, very bouldery	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.47	Large stones content	0.47	Large stones content	0.47
SpF:							
Spivey, very bouldery	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.47	Large stones content	0.47	Large stones content	0.47
						Gravel	0.15
Santeetlah, very bouldery	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.47	Large stones content	0.47	Large stones content	0.47
SvC:							
Spivey, bouldery	50	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Large stones content	0.42	Large stones content	0.42	Large stones content	0.42
						Gravel	0.15
Whiteoak, bouldery	40	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00

Table 11.—Recreation, Part I—Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
SvD:							
Spivey, bouldery	50	Very limited Slope Large stones content	 1.00 0.42	Very limited Slope Large stones content	 1.00 0.42	Very limited Slope Large stones content Gravel	 1.00 0.42 0.15
Whiteoak, bouldery	40	Very limited Slope	 1.00	Very limited Slope	 1.00	Very limited Slope	 1.00
SwB:							
Statler, rarely flooded	90	Very limited Flooding	 1.00	Not limited		Somewhat limited Slope Gravel	 0.88 0.32
SyD:							
Sylco, very rocky	60	Very limited Slope Large stones content	 1.00 0.29	Very limited Slope Large stones content	 1.00 0.29	Very limited Slope Depth to bedrock Gravel Large stones content	 1.00 0.97 0.96 0.29
Cataska, very rocky	30	Very limited Slope Depth to bedrock Large stones content	 1.00 1.00 0.05	Very limited Slope Depth to bedrock Large stones content	 1.00 1.00 0.05	Very limited Slope Depth to bedrock Gravel Large stones content	 1.00 1.00 0.93 0.05
SyE:							
Sylco, very rocky	45	Very limited Slope Large stones content	 1.00 0.29	Very limited Slope Large stones content	 1.00 0.29	Very limited Slope Depth to bedrock Gravel Large stones content	 1.00 0.97 0.96 0.29
Cataska, very rocky	35	Very limited Slope Depth to bedrock Large stones content	 1.00 1.00 0.05	Very limited Slope Depth to bedrock Large stones content	 1.00 1.00 0.05	Very limited Slope Depth to bedrock Gravel Large stones content	 1.00 1.00 0.93 0.05
SyF:							
Sylco, very rocky	50	Very limited Slope Large stones content	 1.00 0.53	Very limited Slope Large stones content	 1.00 0.53	Very limited Slope Depth to bedrock Gravel Large stones content	 1.00 0.97 0.96 0.53
Cataska, very rocky	35	Very limited Slope Depth to bedrock Large stones content	 1.00 1.00 0.53	Very limited Slope Depth to bedrock Large stones content	 1.00 1.00 0.53	Very limited Slope Depth to bedrock Gravel Large stones content	 1.00 1.00 0.93 0.53

Table 11.—Recreation, Part I—Continued

Map symbol and soil name	Pct. of map unit	Camp areas: Rating class and limiting features	Camp areas: Value	Picnic areas: Rating class and limiting features	Picnic areas: Value	Playgrounds: Rating class and limiting features	Playgrounds: Value
ThB:							
Thurmont	55	Not limited		Not limited		Somewhat limited	
						Slope	0.88
Dillard	35	Not limited		Not limited		Somewhat limited	
						Slope	0.50
UdD:							
Udorthents	50	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.04	Slope	0.04	Slope	1.00
						Gravel	0.47
Urban land	40	Not rated		Not rated		Not rated	
UdE:							
Udorthents	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Gravel	0.47
Urban land	35	Not rated		Not rated		Not rated	
UnB:							
Unison	90	Not limited		Not limited		Somewhat limited	
						Slope	0.88
UnC:							
Unison	80	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
UoA:							
Udorthents, rarely flooded	60	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Gravel	0.47
						Slope	0.12
Urban land, rarely flooded	30	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	

Table 11.—Recreation, Part II

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
AkB:							
Alarka, occasionally flooded	65	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Wesser, occasionally flooded	25	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
						Flooding	0.60
BkB2:							
Braddock, moderately eroded	80	Not limited		Not limited		Not limited	
BkC2:							
Braddock, moderately eroded	80	Not limited		Not limited		Somewhat limited	
						Slope	0.63
BkD2:							
Braddock, moderately eroded	85	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Slope	1.00
BnC:							
Braddock	50	Not limited		Not limited		Somewhat limited	
						Slope	0.04
Urban land	30	Not rated		Not rated		Not rated	
BuC:							
Breakneck, very rocky, windswept	45	Not limited		Not limited		Somewhat limited	
						Large stones	0.79
						Depth to bedrock	0.65
						Slope	0.63
Pullback, very rocky, windswept	40	Not limited		Not limited		Very limited	
						Depth to bedrock	1.00
						Droughty	0.96
						Slope	0.63
						Large stones	0.01
BuD:							
Breakneck, very rocky, windswept	65	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Slope	1.00
						Large stones	0.79
						Depth to bedrock	0.65

Table 11.—Recreation, Part II—Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
BuD:							
Pullback, very rocky, windswept	15	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Depth to bedrock	1.00
						Slope	1.00
						Droughty	0.96
						Large stones	0.01
BuE:							
Breakneck, very rocky, windswept	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.47	Large stones content	0.47	Large stones	0.79
						Depth to bedrock	0.65
Pullback, very rocky, windswept	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Large stones content	0.47	Large stones content	0.47	Slope	1.00
						Droughty	0.96
						Large stones	0.01
BuF:							
Breakneck, very rocky, windswept	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.47	Large stones content	0.47	Large stones	0.79
						Depth to bedrock	0.65
Pullback, very rocky, windswept	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Large stones content	0.47	Large stones content	0.47	Slope	1.00
						Droughty	0.96
						Large stones	0.01
ChE:							
Cheoah, stony	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Large stones	0.61
ChF:							
Cheoah, stony	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Large stones	0.61
CrD:							
Cheoah, rocky	65	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Slope	1.00
						Large stones	0.79
Jeffrey, rocky	30	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Slope	1.00
						Large stones	0.32
						Depth to bedrock	0.29
						Droughty	0.15

Table 11.—Recreation, Part II—Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
CrE:							
Cheoah, rocky	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Large stones	0.79
Jeffrey, rocky	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Large stones	0.32
						Depth to bedrock	0.29
						Droughty	0.15
CsF:							
Cheoah, very rocky	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.53	Large stones content	0.53	Large stones	0.79
Jeffrey, very rocky	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.53	Large stones content	0.53	Large stones	0.32
						Depth to bedrock	0.16
						Droughty	0.01
CwA:							
Cullowhee, occasionally flooded	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Depth to saturated zone	0.08	Depth to saturated zone	0.08	Flooding	0.60
						Depth to saturated zone	0.43
						Droughty	0.02
Ela, occasionally flooded	40	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
						Flooding	0.60
DAM:							
Dam	100	Not rated		Not rated		Not rated	
DeB:							
Dellwood, occasionally flooded	60	Not limited		Not limited		Somewhat limited	
						Droughty	0.99
						Flooding	0.60
						Gravel	0.14
						Large stones	0.01
Reddies, occasionally flooded	20	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
DrB:							
Dillard, rarely flooded	80	Not limited		Not limited		Not limited	

Table 11.—Recreation, Part II—Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
DtD:							
Ditney, very stony	40	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.92	Large stones content	0.53	Slope	1.00
		Large stones content	0.53			Depth to bedrock	0.46
						Large stones	0.46
						Droughty	0.12
Unicoi, very stony	35	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.92	Large stones content	0.53	Depth to bedrock	1.00
		Large stones content	0.53			Slope	1.00
						Droughty	1.00
						Large stones	0.92
Rock outcrop	20	Not rated		Not rated		Not rated	
DtE:							
Ditney, very stony	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.53	Large stones content	0.53	Depth to bedrock	0.46
						Large stones	0.46
						Droughty	0.03
Unicoi, very stony	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Large stones content	0.53	Large stones content	0.53	Slope	1.00
						Droughty	1.00
						Large stones	0.26
Rock outcrop	20	Not rated		Not rated		Not rated	
DtF:							
Ditney, very stony	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.53	Large stones content	0.53	Depth to bedrock	0.46
						Large stones	0.46
						Droughty	0.03
Unicoi, very stony	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Large stones content	0.53	Large stones content	0.53	Slope	1.00
						Droughty	1.00
						Large stones	1.00
Rock outcrop	20	Not rated		Not rated		Not rated	
EtA:							
Ela, occasionally flooded	80	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
						Flooding	0.60
						Large stones	0.03
Ela, undrained	10	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
						Flooding	0.60
						Large stones	0.03

Table 11.—Recreation, Part II—Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
FvA:							
Fluvaquents, ponded	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Ponding	1.00	Flooding	1.00
		Flooding	0.40	Flooding	0.40	Depth to saturated zone	1.00
HcD:							
Heintooga, bouldery	55	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.92	Large stones content	0.61	Slope	1.00
		Large stones content	0.61			Large stones	1.00
						Droughty	0.75
Chiltoskie, bouldery	35	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Slope	1.00
HdE:							
Heintooga, very bouldery	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.61	Large stones content	0.61	Large stones	1.00
						Droughty	0.75
Chiltoskie, very bouldery	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.47	Large stones content	0.47		
HmA:							
Hemphill, rarely flooded	75	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
Hemphill, undrained	5	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Ponding	1.00
		Ponding	1.00	Ponding	1.00	Depth to saturated zone	1.00
JbC:							
Junaluska	50	Not limited		Not limited		Somewhat limited	
						Slope	0.63
						Large stones	0.20
						Depth to bedrock	0.06
Brasstown	40	Not limited		Not limited		Somewhat limited	
						Large stones	0.74
						Slope	0.63
JbD:							
Junaluska	50	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Slope	1.00
						Depth to bedrock	0.80
Brasstown	40	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Slope	1.00
						Large stones	0.74

Table 11.—Recreation, Part II—Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
JbE:							
Junaluska	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.80
Brasstown	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Large stones	0.74
JnD:							
Junaluska	40	Not rated		Not rated		Not rated	
Brasstown	30	Not rated		Not rated		Not rated	
Urban land	25	Not rated		Not rated		Not rated	
JtD:							
Junaluska	65	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Slope	1.00
						Depth to bedrock	0.06
Tsali	25	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Depth to bedrock	1.00
						Slope	1.00
						Droughty	0.83
						Large stones	0.32
JtE:							
Junaluska	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.06
Tsali	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
						Slope	1.00
						Droughty	0.83
						Large stones	0.32
JtF:							
Junaluska	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.06
Tsali	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
						Slope	1.00
						Droughty	0.83
						Large stones	0.32
LnC:							
Lonon, bouldery	65	Not limited		Not limited		Somewhat limited	
						Slope	0.63
						Large stones	0.20
Northcove, bouldery	20	Somewhat limited		Somewhat limited		Very limited	
		Large stones content	0.06	Large stones content	0.06	Large stones	1.00
						Slope	0.63
						Droughty	0.41

Table 11.—Recreation, Part II—Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
LnD:							
Lonon, bouldery	65	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Slope	1.00
						Large stones	0.20
Northcove, bouldery	20	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.92	Large stones content	0.06	Slope	1.00
		Large stones content	0.06			Large stones	1.00
						Droughty	0.41
LtD:							
Luftee, very rocky, windswept	55	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.92	Large stones content	0.53	Slope	1.00
		Large stones content	0.53			Large stones	1.00
						Gravel	0.52
						Depth to bedrock	0.16
Anakeesta, very rocky, windswept	30	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.92	Large stones content	0.53	Slope	1.00
		Large stones content	0.53			Large stones	1.00
						Gravel	0.18
LtE:							
Luftee, very rocky, windswept	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.53	Large stones content	0.53	Large stones	1.00
						Gravel	0.52
						Depth to bedrock	0.16
Anakeesta, very rocky, windswept	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.53	Large stones content	0.53	Large stones	1.00
						Gravel	0.18
LtF:							
Luftee, very rocky, windswept	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.53	Large stones content	0.53	Large stones	1.00
						Gravel	0.52
						Depth to bedrock	0.16
Anakeesta, very rocky, windswept	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.53	Large stones content	0.53	Large stones	1.00
						Gravel	0.18
NtE:							
Northcove, very bouldery	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.47	Large stones content	0.47	Large stones	1.00
						Droughty	0.41

Table 11.—Recreation, Part II—Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
NtE:							
Lonon, very bouldery	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.47	Large stones content	0.47	Large stones	0.20
RdA:							
Reddies, occasionally flooded	80	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
SbE:							
Snowbird, stony	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
SbF:							
Snowbird, stony	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
ScD:							
Soco, stony	50	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Slope	1.00
						Large stones	0.32
						Depth to bedrock	0.10
Stecoah, stony	40	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Slope	1.00
						Large stones	0.61
ScE:							
Soco, stony	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Large stones	0.32
						Depth to bedrock	0.10
Stecoah, stony	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Large stones	0.61
ScF:							
Soco, stony	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Large stones	0.79
						Depth to bedrock	0.10
Stecoah, stony	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Large stones	0.61
SdD:							
Soco, rocky	50	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Slope	1.00
						Large stones	0.79
						Depth to bedrock	0.10
Stecoah, rocky	35	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Slope	1.00
						Large stones	0.68

Table 11.—Recreation, Part II—Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
SdE:							
Soco, rocky	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Large stones	0.79
						Depth to bedrock	0.10
Stecoah, rocky	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Large stones	0.68
SdF:							
Soco, rocky	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Large stones	0.32
						Depth to bedrock	0.10
Stecoah, rocky	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Large stones	0.61
SnD:							
Soco, stony, windswept	50	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Slope	1.00
						Depth to bedrock	0.95
						Large stones	0.61
						Droughty	0.07
Stecoah, stony, windswept	40	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Slope	1.00
						Large stones	0.54
SnE:							
Soco, stony, windswept	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Depth to bedrock	0.95
						Large stones	0.61
						Droughty	0.07
Stecoah, stony, windswept	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Large stones	0.54
SpE:							
Spivey, very bouldery	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.47	Large stones content	0.47	Large stones	1.00
						Droughty	0.15
Santeetlah, very bouldery	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.47	Large stones content	0.47	Large stones	0.03

Table 11.—Recreation, Part II—Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Value	Off-road motorcycle trails: Rating class and limiting features	Value	Golf fairways: Rating class and limiting features	Value
SpF:							
Spivey, very bouldery	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.47	Large stones content	0.47	Large stones	1.00
						Droughty	0.15
Santeetlah, very bouldery	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.47	Large stones content	0.47	Large stones	0.03
SvC:							
Spivey, bouldery	50	Somewhat limited		Somewhat limited		Very limited	
		Large stones content	0.42	Large stones content	0.42	Large stones	1.00
						Slope	0.63
						Droughty	0.15
Whiteoak, bouldery	40	Not limited		Not limited		Somewhat limited	
						Slope	0.63
SvD:							
Spivey, bouldery	50	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.92	Large stones content	0.42	Slope	1.00
		Large stones content	0.42			Large stones	1.00
						Droughty	0.15
Whiteoak, bouldery	40	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Slope	1.00
SwB:							
Statler, rarely flooded	90	Not limited		Not limited		Not limited	
SyD:							
Sylco, very rocky	60	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.92	Large stones content	0.29	Slope	1.00
		Large stones content	0.29			Large stones	1.00
						Depth to bedrock	0.97
						Droughty	0.56
Cataska, very rocky	30	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.92	Large stones content	0.05	Depth to bedrock	1.00
		Large stones content	0.05			Slope	1.00
						Large stones	1.00
						Droughty	1.00
SyE:							
Sylco, very rocky	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.29	Large stones content	0.29	Large stones	1.00
						Depth to bedrock	0.97
						Droughty	0.56
Cataska, very rocky	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Large stones content	0.05	Large stones content	0.05	Slope	1.00
						Large stones	1.00
						Droughty	1.00

Table 11.—Recreation, Part II—Continued

Map symbol and soil name	Pct. of map unit	Paths and trails: Rating class and limiting features	Paths and trails: Value	Off-road motorcycle trails: Rating class and limiting features	Off-road motorcycle trails: Value	Golf fairways: Rating class and limiting features	Golf fairways: Value
SyF:							
Sylco, very rocky	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones content	0.53	Large stones content	0.53	Large stones	1.00
						Depth to bedrock	0.97
						Droughty	0.56
Cataska, very rocky	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Depth to bedrock	1.00
		Large stones content	0.53	Large stones content	0.53	Slope	1.00
						Large stones	1.00
						Droughty	1.00
ThB:							
Thurmont	55	Not limited		Not limited		Not limited	
Dillard	35	Not limited		Not limited		Not limited	
UdD:							
Udorthents	50	Not limited		Not limited		Somewhat limited	
						Large stones	0.92
						Slope	0.04
Urban land	40	Not rated		Not rated		Not rated	
UdE:							
Udorthents	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Large stones	0.92
Urban land	35	Not rated		Not rated		Not rated	
UnB:							
Unison	90	Not limited		Not limited		Not limited	
UnC:							
Unison	80	Not limited		Not limited		Somewhat limited	
						Slope	0.63
UoA:							
Udorthents, rarely flooded	60	Not limited		Not limited		Somewhat limited	
						Large stones	0.92
Urban land, rarely flooded	30	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	

Table 12.—Building Site Development, Part I

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
AkB:							
Alarka, occasionally flooded	65	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Slope	0.50
Wesser, occasionally flooded	25	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
BkB2:							
Braddock, moderately eroded	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.12
BkC2:							
Braddock, moderately eroded	80	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
BkD2:							
Braddock, moderately eroded	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
BnC:							
Braddock	50	Somewhat limited		Somewhat limited		Very limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	1.00
		Slope	0.04	Slope	0.04	Shrink-swell	0.50
Urban land	30	Not rated		Not rated		Not rated	
BuC:							
Breakneck, very rocky, windswept	45	Somewhat limited		Very limited		Very limited	
		Depth to hard bedrock	0.64	Depth to hard bedrock	1.00	Slope	1.00
		Slope	0.63	Slope	0.63	Depth to hard bedrock	0.64
Pullback, very rocky, windswept	40	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Slope	0.63	Slope	0.63	Depth to hard bedrock	1.00

Table 12.—Building Site Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
BuD:							
Breakneck, very rocky, windswept	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.64	Depth to hard bedrock	1.00	Depth to hard bedrock	0.64
Pullback, very rocky, windswept	15	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
BuE:							
Breakneck, very rocky, windswept	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.64	Depth to hard bedrock	1.00	Depth to hard bedrock	0.64
Pullback, very rocky, windswept	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
BuF:							
Breakneck, very rocky, windswept	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.64	Depth to hard bedrock	1.00	Depth to hard bedrock	0.64
Pullback, very rocky, windswept	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
ChE:							
Cheoah, stony	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
ChF:							
Cheoah, stony	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
CrD:							
Cheoah, rocky	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Jeffrey, rocky	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.29	Depth to hard bedrock	1.00	Depth to hard bedrock	0.29
CrE:							
Cheoah, rocky	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00

Table 12.—Building Site Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
CrE:							
Jeffrey, rocky	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.29	Depth to hard bedrock	1.00	Depth to hard bedrock	0.29
CsF:							
Cheoah, very rocky	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Jeffrey, very rocky	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.15	Depth to hard bedrock	1.00	Depth to hard bedrock	0.15
CwA:							
Cullowhee, occasionally flooded	50	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.77	Depth to saturated zone	1.00	Depth to saturated zone	0.77
Ela, occasionally flooded	40	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
DAM:							
Dam	100	Not rated		Not rated		Not rated	
DeB:							
Dellwood, occasionally flooded	60	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Large stones	0.02	Depth to saturated zone	0.95	Large stones	0.02
				Large stones	0.02		
Reddies, occasionally flooded	20	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	0.99		
DrB:							
Dillard, rarely flooded	80	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	1.00		
DtD:							
Ditney, very stony	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.46	Depth to hard bedrock	1.00	Depth to hard bedrock	0.46

Table 12.—Building Site Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
DtD:							
Unicoi, very stony	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Large stones	0.76	Large stones	0.76	Large stones	0.76
Rock outcrop	20	Not rated		Not rated		Not rated	
DtE:							
Ditney, very stony	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.46	Depth to hard bedrock	1.00	Depth to hard bedrock	0.46
Unicoi, very stony	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Large stones	0.25	Large stones	0.25	Large stones	0.25
Rock outcrop	20	Not rated		Not rated		Not rated	
DtF:							
Ditney, very stony	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.46	Depth to hard bedrock	1.00	Depth to hard bedrock	0.46
Unicoi, very stony	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to hard bedrock	1.00
		Large stones	0.53	Large stones	0.53	Large stones	0.53
Rock outcrop	20	Not rated		Not rated		Not rated	
EtA:							
Ela, occasionally flooded	80	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Ela, undrained	10	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
FvA:							
Fluvaquents, ponded	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00

Table 12.—Building Site Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
HcD:							
Heintooga, bouldery	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	1.00	Large stones	1.00	Large stones	1.00
Chiltoskie, bouldery	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
HdE:							
Heintooga, very bouldery	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	1.00	Large stones	1.00	Large stones	1.00
Chiltoskie, very bouldery	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
HmA:							
Hemphill, rarely flooded	75	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Hemphill, undrained	5	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
JbC:							
Junaluska	50	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
				Depth to soft bedrock	0.06		
Brasstown	40	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
JbD:							
Junaluska	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.79		
Brasstown	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
JbE:							
Junaluska	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.79		
Brasstown	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00

Table 12.—Building Site Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
JnD:							
Junaluska	40	Not rated		Not rated		Not rated	
Brasstown	30	Not rated		Not rated		Not rated	
Urban land	25	Not rated		Not rated		Not rated	
JtD:							
Junaluska	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.06		
Tsali	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to soft bedrock	0.50	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
JtE:							
Junaluska	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.06		
Tsali	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to soft bedrock	0.50	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
JtF:							
Junaluska	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.06		
Tsali	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to soft bedrock	0.50	Depth to soft bedrock	1.00	Depth to soft bedrock	1.00
LnC:							
Lonon, bouldery	65	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
Northcove, bouldery	20	Somewhat limited		Somewhat limited		Very limited	
		Large stones	0.84	Large stones	0.84	Slope	1.00
		Slope	0.63	Slope	0.63	Large stones	0.84
LnD:							
Lonon, bouldery	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Northcove, bouldery	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	0.84	Large stones	0.84	Large stones	0.84

Table 12.—Building Site Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
LtD:							
Luftee, very rocky, windswept	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	0.57	Depth to hard bedrock	1.00	Large stones	0.57
		Depth to hard bedrock	0.15	Large stones	0.57	Depth to hard bedrock	0.15
Anakeesta, very rocky, windswept	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	0.49	Depth to hard bedrock	0.84	Large stones	0.49
				Large stones	0.49		
LtE:							
Luftee, very rocky, windswept	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	0.57	Depth to hard bedrock	1.00	Large stones	0.57
		Depth to hard bedrock	0.15	Large stones	0.57	Depth to hard bedrock	0.15
Anakeesta, very rocky, windswept	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	0.49	Depth to hard bedrock	0.84	Large stones	0.49
				Large stones	0.49		
LtF:							
Luftee, very rocky, windswept	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	0.57	Depth to hard bedrock	1.00	Large stones	0.57
		Depth to hard bedrock	0.15	Large stones	0.57	Depth to hard bedrock	0.15
Anakeesta, very rocky, windswept	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	0.49	Depth to hard bedrock	0.84	Large stones	0.49
				Large stones	0.49		
NtE:							
Northcove, very bouldery	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	0.98	Large stones	0.98	Large stones	0.98
Lonon, very bouldery	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
RdA:							
Reddies, occasionally flooded	80	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	0.99		

Table 12.—Building Site Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
SbE:							
Snowbird, stony	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
SbF:							
Snowbird, stony	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
ScD:							
Soco, stony	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.10		
Stecoah, stony	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
ScE:							
Soco, stony	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.10		
Stecoah, stony	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
ScF:							
Soco, stony	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.10		
Stecoah, stony	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
SdD:							
Soco, rocky	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.10		
Stecoah, rocky	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
SdE:							
Soco, rocky	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.10		
Stecoah, rocky	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
SdF:							
Soco, rocky	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.10		
Stecoah, rocky	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00

Table 12.—Building Site Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
SnD:							
Soco, stony, windswept	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.95		
Stecoah, stony, windswept	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
SnE:							
Soco, stony, windswept	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
				Depth to soft bedrock	0.95		
Stecoah, stony, windswept	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
SpE:							
Spivey, very bouldery	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	1.00	Large stones	1.00	Large stones	1.00
Santeetlah, very bouldery	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
SpF:							
Spivey, very bouldery	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	1.00	Large stones	1.00	Large stones	1.00
Santeetlah, very bouldery	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
SvC:							
Spivey, bouldery	50	Very limited		Very limited		Very limited	
		Large stones	1.00	Large stones	1.00	Slope	1.00
		Slope	0.63	Slope	0.63	Large stones	1.00
Whiteoak, bouldery	40	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
SvD:							
Spivey, bouldery	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	1.00	Large stones	1.00	Large stones	1.00
Whiteoak, bouldery	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00

Table 12.—Building Site Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
SwB:							
Statler, rarely flooded	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	0.16	Slope	0.12
SyD:							
Sylco, very rocky	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.97	Depth to hard bedrock	1.00	Depth to hard bedrock	0.97
		Large stones	0.77	Large stones	0.77	Large stones	0.77
Cataska, very rocky	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.64	Depth to hard bedrock	1.00	Depth to soft bedrock	1.00
		Large stones	0.50	Depth to soft bedrock	1.00	Depth to hard bedrock	0.64
		Depth to soft bedrock	0.50	Large stones	0.50	Large stones	0.50
SyE:							
Sylco, very rocky	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.97	Depth to hard bedrock	1.00	Depth to hard bedrock	0.97
		Large stones	0.77	Large stones	0.77	Large stones	0.77
Cataska, very rocky	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.64	Depth to hard bedrock	1.00	Depth to soft bedrock	1.00
		Large stones	0.50	Depth to soft bedrock	1.00	Depth to hard bedrock	0.64
		Depth to soft bedrock	0.50	Large stones	0.50	Large stones	0.50
SyF:							
Sylco, very rocky	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.97	Depth to hard bedrock	1.00	Depth to hard bedrock	0.97
		Large stones	0.77	Large stones	0.77	Large stones	0.77
Cataska, very rocky	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to hard bedrock	0.64	Depth to hard bedrock	1.00	Depth to soft bedrock	1.00
		Large stones	0.50	Depth to soft bedrock	1.00	Depth to hard bedrock	0.64
		Depth to soft bedrock	0.50	Large stones	0.50	Large stones	0.50

Table 12.—Building Site Development, Part I—Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements: Rating class and limiting features	Value	Dwellings with basements: Rating class and limiting features	Value	Small commercial buildings: Rating class and limiting features	Value
ThB:							
Thurmont	55	Not limited		Somewhat limited		Somewhat limited	
				Depth to saturated zone	0.35	Slope	0.12
Dillard	35	Not limited		Very limited		Not limited	
				Depth to saturated zone	1.00		
UdD:							
Udorthents	50	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.04	Slope	0.04	Slope	1.00
Urban land	40	Not rated		Not rated		Not rated	
UdE:							
Udorthents	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Urban land	35	Not rated		Not rated		Not rated	
UnB:							
Unison	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
						Slope	0.12
UnC:							
Unison	80	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
UoA:							
Udorthents, rarely flooded	60	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
Urban land, rarely flooded	30	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	

Table 12.—Building Site Development, Part II

(Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
AkB:							
Alarka, occasionally flooded	65	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Unstable excavation walls	1.00		
		Flooding	0.40				
Wesser, occasionally flooded	25	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Unstable excavation walls	1.00	Flooding	0.60
		Frost action	0.50	Flooding	0.60		
BkB2:							
Braddock, moderately eroded	80	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Too clayey	0.12		
		Shrink-swell	0.50	Unstable excavation walls	0.10		
		Frost action	0.50				
BkC2:							
Braddock, moderately eroded	80	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.63	Slope	0.63
		Slope	0.63	Too clayey	0.12		
		Shrink-swell	0.50	Unstable excavation walls	0.10		
		Frost action	0.50				
BkD2:							
Braddock, moderately eroded	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Too clayey	0.12		
		Shrink-swell	0.50	Unstable excavation walls	0.10		
		Frost action	0.50				
BnC:							
Braddock	50	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Too clayey	0.12	Slope	0.04
		Shrink-swell	0.50	Unstable excavation walls	0.10		
		Frost action	0.50				
		Slope	0.04	Slope	0.04		
Urban land	30	Not rated		Not rated		Not rated	

Table 12.—Building Site Development, Part II—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
BuC:							
Breakneck, very rocky, windswept	45	Somewhat limited		Very limited		Somewhat limited	
		Depth to hard bedrock	0.64	Depth to hard bedrock	1.00	Large stones	0.79
						Depth to bedrock	0.65
		Slope	0.63	Slope	0.63	Slope	0.63
		Frost action	0.50	Unstable excavation walls	0.10		
Pullback, very rocky, windswept	40	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
						Droughty	0.96
		Slope	0.63	Slope	0.63	Slope	0.63
		Frost action	0.50	Unstable excavation walls	0.10	Large stones	0.01
BuD:							
Breakneck, very rocky, windswept	65	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.64			Large stones	0.79
				Slope	1.00	Depth to bedrock	0.65
		Frost action	0.50	Unstable excavation walls	0.10		
Pullback, very rocky, windswept	15	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
						Slope	1.00
		Slope	1.00	Slope	1.00	Droughty	0.96
		Frost action	0.50	Unstable excavation walls	0.10	Large stones	0.01
BuE:							
Breakneck, very rocky, windswept	55	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.64			Large stones	0.79
				Slope	1.00	Depth to bedrock	0.65
		Frost action	0.50	Unstable excavation walls	0.10		
Pullback, very rocky, windswept	30	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
						Slope	1.00
		Slope	1.00	Slope	1.00	Droughty	0.96
		Frost action	0.50	Unstable excavation walls	0.10	Large stones	0.01
BuF:							
Breakneck, very rocky, windswept	55	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.64			Large stones	0.79
				Slope	1.00	Depth to bedrock	0.65
		Frost action	0.50	Unstable excavation walls	0.10		

Table 12.—Building Site Development, Part II—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
BuF:							
Pullback, very rocky, windswept	30	Very limited		Very limited		Very limited	
		Depth to hard	1.00	Depth to hard	1.00	Depth to bedrock	1.00
		bedrock		bedrock		Slope	1.00
		Slope	1.00	Slope	1.00	Droughty	0.96
		Frost action	0.50	Unstable	0.10	Large stones	0.01
				excavation walls			
ChE:							
Cheoah, stony	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Unstable	0.10	Large stones	0.61
				excavation walls			
ChF:							
Cheoah, stony	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Unstable	0.10	Large stones	0.61
				excavation walls			
CrD:							
Cheoah, rocky	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Unstable	0.10	Large stones	0.79
				excavation walls			
Jeffrey, rocky	30	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard	1.00	Slope	1.00
		Frost action	0.50	bedrock		Large stones	0.32
		Depth to hard	0.29	Slope	1.00	Depth to bedrock	0.29
		bedrock		Unstable	0.10	Droughty	0.15
				excavation walls			
CrE:							
Cheoah, rocky	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Unstable	0.10	Large stones	0.79
				excavation walls			
Jeffrey, rocky	40	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard	1.00	Slope	1.00
		Frost action		bedrock		Large stones	0.32
		Depth to hard	0.50	Slope	1.00	Depth to bedrock	0.29
		bedrock	0.29	Unstable	0.10	Droughty	0.15
				excavation walls			
CsF:							
Cheoah, very rocky	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Unstable	0.10	Large stones	0.79
				excavation walls			
Jeffrey, very rocky	40	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard	1.00	Slope	1.00
		Frost action	0.50	bedrock		Large stones	0.32
		Depth to hard	0.15	Slope	1.00	Depth to bedrock	0.16
		bedrock		Unstable	0.10	Droughty	0.01
				excavation walls			

Table 12.—Building Site Development, Part II—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
CwA:							
Cullowhee, occasionally flooded	50	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Depth to saturated zone	1.00	Flooding	0.60
		Frost action	0.50	Unstable excavation walls	1.00	Depth to saturated zone	0.43
		Depth to saturated zone	0.43	Flooding	0.60	Droughty	0.02
Ela, occasionally flooded	40	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Unstable excavation walls	1.00	Flooding	0.60
		Frost action	0.50	Flooding	0.60		
DAM:							
Dam	100	Not rated		Not rated		Not rated	
DeB:							
Dellwood, occasionally flooded	60	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Unstable excavation walls	1.00	Droughty	0.99
		Large stones	0.02	Depth to saturated zone	0.95	Flooding	0.60
				Flooding	0.60	Gravel	0.14
				Large stones	0.02	Large stones	0.01
Reddies, occasionally flooded	20	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Unstable excavation walls	1.00	Flooding	0.60
		Frost action	0.50	Depth to saturated zone	0.99		
				Flooding	0.60		
DrB:							
Dillard, rarely flooded	80	Very limited		Very limited		Not limited	
		Low strength	1.00	Depth to saturated zone	1.00		
		Frost action	0.50	Unstable excavation walls	0.10		
		Flooding	0.40				
DtD:							
Ditney, very stony	40	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Frost action	0.50	Slope	1.00	Depth to bedrock	0.46
		Depth to hard bedrock	0.46	Unstable excavation walls	0.10	Large stones	0.46
						Droughty	0.12

Table 12.—Building Site Development, Part II—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
DtD:							
Unicoi, very stony	35	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	0.76	Large stones	0.76	Droughty	1.00
		Frost action	0.50	Unstable excavation walls	0.10	Large stones	0.92
Rock outcrop	20	Not rated		Not rated		Not rated	
DtE:							
Ditney, very stony	40	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Frost action	0.50	Slope	1.00	Depth to bedrock	0.46
		Depth to hard bedrock	0.46	Unstable excavation walls	0.10	Large stones	0.46
						Droughty	0.03
Unicoi, very stony	35	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Large stones	0.25	Droughty	1.00
		Large stones	0.25	Unstable excavation walls	0.10	Large stones	0.26
Rock outcrop	20	Not rated		Not rated		Not rated	
DtF:							
Ditney, very stony	40	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Frost action	0.50	Slope	1.00	Depth to bedrock	0.46
		Depth to hard bedrock	0.46	Unstable excavation walls	0.10	Large stones	0.46
						Droughty	0.03
Unicoi, very stony	35	Very limited		Very limited		Very limited	
		Depth to hard bedrock	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	0.53	Large stones	0.53	Droughty	1.00
		Frost action	0.50	Unstable excavation walls	0.10	Large stones	1.00
Rock outcrop	20	Not rated		Not rated		Not rated	
EtA:							
Ela, occasionally flooded	80	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Flooding	0.60	Flooding	0.60
		Flooding	1.00	Unstable excavation walls	0.10	Large stones	0.03

Table 12.—Building Site Development, Part II—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
EtA:							
Ela, undrained	10	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Flooding	0.60	Flooding	0.60
		Flooding	1.00	Unstable excavation walls	0.10	Large stones	0.03
FvA:							
Fluvaquents, ponded	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Frost action	1.00	Flooding	0.80	Depth to saturated zone	1.00
		Flooding	1.00	Unstable excavation walls	0.10		
HcD:							
Heintooga, bouldery	55	Very limited		Very limited		Very limited	
		Large stones	1.00	Large stones	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Large stones	1.00
		Frost action	0.50	Unstable excavation walls	0.10	Droughty	0.75
Chiltoskie, bouldery	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Unstable excavation walls	0.10		
HdE:							
Heintooga, very bouldery	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	1.00	Large stones	1.00	Large stones	1.00
		Frost action	0.50	Unstable excavation walls	0.10	Droughty	0.75
Chiltoskie, very bouldery	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Unstable excavation walls	0.10		
HmA:							
Hemphill, rarely flooded	75	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
		Flooding	0.40				
Hemphill, undrained	5	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Unstable excavation walls	0.10		
		Low strength	1.00				
		Flooding	0.40				

Table 12.—Building Site Development, Part II—Continued

<table>
<tr><th rowspan="2">Map unit symbol and soil name</th><th rowspan="2">Pct. of map unit</th><th colspan="2">Local roads and streets</th><th colspan="2">Shallow excavations</th><th colspan="2">Lawns and landscaping</th></tr>
<tr><th>Rating class and limiting features</th><th>Value</th><th>Rating class and limiting features</th><th>Value</th><th>Rating class and limiting features</th><th>Value</th></tr>
<tr><td>JbC:</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Junaluska</td><td>50</td><td>Somewhat limited
Slope
Frost action</td><td>
0.63
0.50</td><td>Somewhat limited
Slope
Unstable excavation walls
Depth to soft bedrock</td><td>
0.63
0.10
0.06</td><td>Somewhat limited
Slope
Large stones
Depth to bedrock</td><td>
0.63
0.20
0.06</td></tr>
<tr><td>Brasstown</td><td>40</td><td>Very limited
Low strength
Slope
Frost action</td><td>
1.00
0.63
0.50</td><td>Somewhat limited
Slope
Unstable excavation walls</td><td>
0.63
0.10</td><td>Somewhat limited
Large stones
Slope</td><td>
0.74
0.63</td></tr>
<tr><td>JbD:</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Junaluska</td><td>50</td><td>Very limited
Slope
Frost action</td><td>
1.00
0.50</td><td>Very limited
Slope
Depth to soft bedrock
Unstable excavation walls</td><td>
1.00
0.79
0.10</td><td>Very limited
Slope
Depth to bedrock</td><td>
1.00
0.80</td></tr>
<tr><td>Brasstown</td><td>40</td><td>Very limited
Slope
Low strength
Frost action</td><td>
1.00
1.00
0.50</td><td>Very limited
Slope
Unstable excavation walls</td><td>
1.00
0.10</td><td>Very limited
Slope
Large stones</td><td>
1.00
0.74</td></tr>
<tr><td>JbE:</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Junaluska</td><td>50</td><td>Very limited
Slope
Frost action</td><td>
1.00
0.50</td><td>Very limited
Slope
Depth to soft bedrock
Unstable excavation walls</td><td>
1.00
0.79
0.10</td><td>Very limited
Slope
Depth to bedrock</td><td>
1.00
0.80</td></tr>
<tr><td>Brasstown</td><td>40</td><td>Very limited
Slope
Low strength
Frost action</td><td>
1.00
1.00
0.50</td><td>Very limited
Slope
Unstable excavation walls</td><td>
1.00
0.10</td><td>Very limited
Slope
Large stones</td><td>
1.00
0.74</td></tr>
<tr><td>JnD:</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Junaluska</td><td>40</td><td>Not rated</td><td></td><td>Not rated</td><td></td><td>Not rated</td><td></td></tr>
<tr><td>Brasstown</td><td>30</td><td>Not rated</td><td></td><td>Not rated</td><td></td><td>Not rated</td><td></td></tr>
<tr><td>Urban land</td><td>25</td><td>Not rated</td><td></td><td>Not rated</td><td></td><td>Not rated</td><td></td></tr>
<tr><td>JtD:</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Junaluska</td><td>65</td><td>Very limited
Slope
Frost action</td><td>
1.00
0.50</td><td>Very limited
Slope
Unstable excavation walls
Depth to soft bedrock</td><td>
1.00
0.10
0.06</td><td>Very limited
Slope
Depth to bedrock</td><td>
1.00
0.06</td></tr>
<tr><td>Tsali</td><td>25</td><td>Very limited
Slope
Depth to soft bedrock
Low strength
Frost action</td><td>
1.00
1.00
0.78
0.50</td><td>Very limited
Depth to soft bedrock
Slope
Unstable excavation walls</td><td>
1.00
1.00
0.10</td><td>Very limited
Depth to bedrock
Slope
Droughty
Large stones</td><td>
1.00
1.00
0.83
0.32</td></tr>
</table>

Table 12.—Building Site Development, Part II—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
JtE:							
Junaluska	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Unstable excavation walls	0.10	Depth to bedrock	0.06
				Depth to soft bedrock	0.06		
Tsali	25	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Depth to soft bedrock	1.00	Slope	1.00	Slope	1.00
		Low strength	0.78	Unstable excavation walls	0.10	Droughty	0.83
		Frost action	0.50			Large stones	0.32
JtF:							
Junaluska	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Unstable excavation walls	0.10	Depth to bedrock	0.06
				Depth to soft bedrock	0.06		
Tsali	25	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to soft bedrock	1.00	Depth to bedrock	1.00
		Depth to soft bedrock	1.00	Slope	1.00	Slope	1.00
		Low strength	0.78	Unstable excavation walls	0.10	Droughty	0.83
		Frost action	0.50			Large stones	0.32
LnC:							
Lonon, bouldery	65	Very limited		Somewhat limited		Somewhat limited	
		Low strength	1.00	Slope	0.63	Slope	0.63
		Slope	0.63	Unstable excavation walls	0.10	Large stones	0.20
		Frost action	0.50				
Northcove, bouldery	20	Somewhat limited		Somewhat limited		Very limited	
		Large stones	0.84	Large stones	0.84	Large stones	1.00
		Slope	0.63	Slope	0.63	Slope	0.63
		Frost action	0.50	Unstable excavation walls	0.10	Droughty	0.41
LnD:							
Lonon, bouldery	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Unstable excavation walls	0.10	Large stones	0.20
		Frost action	0.50				
Northcove, bouldery	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	0.84	Large stones	0.84	Large stones	1.00
		Frost action	0.50	Unstable excavation walls	0.10	Droughty	0.41

Table 12.—Building Site Development, Part II—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
LtD:							
Luftee, very rocky, windswept	55	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Large stones	0.57	Slope	1.00	Large stones	1.00
		Frost action	0.50	Large stones	0.57	Gravel	0.52
		Depth to hard bedrock	0.15	Unstable excavation walls	0.10	Depth to bedrock	0.16
Anakeesta, very rocky, windswept	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Depth to hard bedrock	0.84	Large stones	1.00
		Large stones	0.49	Large stones	0.49	Gravel	0.18
				Unstable excavation walls	0.10		
LtE:							
Luftee, very rocky, windswept	55	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Large stones	0.57	Slope	1.00	Large stones	1.00
		Frost action	0.50	Large stones	0.57	Gravel	0.52
		Depth to hard bedrock	0.15	Unstable excavation walls	0.10	Depth to bedrock	0.16
Anakeesta, very rocky, windswept	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Depth to hard bedrock	0.84	Large stones	1.00
		Large stones	0.49	Large stones	0.49	Gravel	0.18
				Unstable excavation walls	0.10		
LtF:							
Luftee, very rocky, windswept	55	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Large stones	0.57	Slope	1.00	Large stones	1.00
		Frost action	0.50	Large stones	0.57	Gravel	0.52
		Depth to hard bedrock	0.15	Unstable excavation walls	0.10	Depth to bedrock	0.16
Anakeesta, very rocky, windswept	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Depth to hard bedrock	0.84	Large stones	1.00
		Large stones	0.49	Large stones	0.49	Gravel	0.18
				Unstable excavation walls	0.10		

Table 12.—Building Site Development, Part II—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
NtE:							
Northcove, very bouldery	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	0.98	Large stones	0.98	Large stones	1.00
		Frost action	0.50	Unstable excavation walls	0.10	Droughty	0.41
Lonon, very bouldery	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Unstable excavation walls	0.10	Large stones	0.20
		Frost action	0.50				
RdA:							
Reddies, occasionally flooded	80	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Unstable excavation walls	1.00	Flooding	0.60
		Frost action	0.50	Depth to saturated zone	0.99		
				Flooding	0.60		
SbE:							
Snowbird, stony	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Unstable excavation walls	0.10		
		Frost action	0.50				
SbF:							
Snowbird, stony	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Unstable excavation walls	0.10		
		Frost action	0.50				
ScD:							
Soco, stony	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Depth to soft bedrock	0.10	Large stones	0.32
				Unstable excavation walls	0.10	Depth to bedrock	0.10
Stecoah, stony	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Unstable excavation walls	0.10	Large stones	0.61
ScE:							
Soco, stony	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Depth to soft bedrock	0.10	Large stones	0.32
				Unstable excavation walls	0.10	Depth to bedrock	0.10
Stecoah, stony	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Unstable excavation walls	0.10	Large stones	0.61

Table 12.—Building Site Development, Part II—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
ScF:							
Soco, stony	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Depth to soft bedrock	0.10	Large stones	0.79
				Unstable excavation walls	0.10	Depth to bedrock	0.10
Stecoah, stony	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Unstable excavation walls	0.10	Large stones	0.61
SdD:							
Soco, rocky	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Depth to soft bedrock	0.10	Large stones	0.79
				Unstable excavation walls	0.10	Depth to bedrock	0.10
Stecoah, rocky	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Unstable excavation walls	0.10	Large stones	0.68
SdE:							
Soco, rocky	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Depth to soft bedrock	0.10	Large stones	0.79
				Unstable excavation walls	0.10	Depth to bedrock	0.10
Stecoah, rocky	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Unstable excavation walls	0.10	Large stones	0.68
SdF:							
Soco, rocky	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Depth to soft bedrock	0.10	Large stones	0.32
				Unstable excavation walls	0.10	Depth to bedrock	0.10
Stecoah, rocky	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Unstable excavation walls	0.10	Large stones	0.61
SnD:							
Soco, stony, windswept	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Depth to soft bedrock	0.95	Depth to bedrock	0.95
				Unstable excavation walls	0.10	Large stones	0.61
						Droughty	0.07

Table 12.—Building Site Development, Part II—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
SnD:							
Stecoah, stony, windswept	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Unstable excavation walls	0.10	Large stones	0.54
SnE:							
Soco, stony, windswept	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Depth to soft bedrock	0.95	Depth to bedrock	0.95
						Large stones	0.61
				Unstable excavation walls	0.10	Droughty	0.07
Stecoah, stony, windswept	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Unstable excavation walls	0.10	Large stones	0.54
SpE:							
Spivey, very bouldery	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	1.00	Large stones	1.00	Large stones	1.00
		Frost action	0.50	Unstable excavation walls	0.10	Droughty	0.15
Santeetlah, very bouldery	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	0.78	Unstable excavation walls	0.10	Large stones	0.03
		Frost action	0.50				
SpF:							
Spivey, very bouldery	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	1.00	Large stones	1.00	Large stones	1.00
		Frost action	0.50	Unstable excavation walls	0.10	Droughty	0.15
Santeetlah, very bouldery	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	0.78	Unstable excavation walls	0.10	Large stones	0.03
		Frost action	0.50				
SvC:							
Spivey, bouldery	50	Very limited		Very limited		Very limited	
		Large stones	1.00	Large stones	1.00	Large stones	1.00
		Slope	0.63	Slope	0.63	Slope	0.63
		Frost action	0.50	Unstable excavation walls	0.10	Droughty	0.15
Whiteoak, bouldery	40	Somewhat limited		Somewhat limited		Somewhat limited	
		Low strength	0.78	Slope	0.63	Slope	0.63
		Slope	0.63	Unstable excavation walls	0.10		
		Frost action	0.50				

Table 12.—Building Site Development, Part II—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
SvD:							
Spivey, bouldery	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	1.00	Large stones	1.00	Large stones	1.00
		Frost action	0.50	Unstable excavation walls	0.10	Droughty	0.15
Whiteoak, bouldery	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Low strength	0.78	Unstable excavation walls	0.10		
		Frost action	0.50				
SwB:							
Statler, rarely flooded	90	Very limited		Somewhat limited		Not limited	
		Low strength	1.00	Depth to saturated zone	0.16		
		Frost action	0.50	Unstable excavation walls	0.10		
		Flooding	0.40				
SyD:							
Sylco, very rocky	60	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.97	Slope	1.00	Large stones	1.00
		Large stones	0.77	Large stones	0.77	Depth to bedrock	0.97
		Frost action	0.50	Unstable excavation walls	0.10	Droughty	0.56
Cataska, very rocky	30	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.64	Slope	1.00	Large stones	1.00
		Large stones	0.50	Large stones	0.50	Droughty	1.00
		Frost action	0.50	Unstable excavation walls	0.50		
SyE:							
Sylco, very rocky	45	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.97	Slope	1.00	Large stones	1.00
		Large stones	0.77	Large stones	0.77	Depth to bedrock	0.97
		Frost action	0.50	Unstable excavation walls	0.10	Droughty	0.56
Cataska, very rocky	35	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.64	Slope	1.00	Large stones	1.00
		Large stones	0.50	Large stones	0.50	Droughty	1.00
		Frost action	0.50	Unstable excavation walls	0.50		

Table 12.—Building Site Development, Part II—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
SyF:							
Sylco, very rocky	50	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.97	Slope	1.00	Large stones	1.00
		Large stones	0.77	Large stones	0.77	Depth to bedrock	0.97
		Frost action	0.50	Unstable excavation walls	0.10	Droughty	0.56
Cataska, very rocky	35	Very limited		Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00	Depth to bedrock	1.00
		Depth to soft bedrock	1.00	Depth to soft bedrock	1.00	Slope	1.00
		Depth to hard bedrock	0.64	Slope	1.00	Large stones	1.00
		Large stones	0.50	Large stones	0.50	Droughty	1.00
		Frost action	0.50	Unstable excavation walls	0.50		
ThB:							
Thurmont	55	Somewhat limited		Somewhat limited		Not limited	
		Frost action	0.50	Depth to saturated zone	0.35		
				Unstable excavation walls	0.10		
Dillard	35	Very limited		Very limited		Not limited	
		Low strength	1.00	Depth to saturated zone	1.00		
		Frost action	0.50	Unstable excavation walls	0.10		
UdD:							
Udorthents	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Unstable excavation walls	0.10	Large stones	0.92
		Slope	0.04	Slope	0.04	Slope	0.04
Urban land	40	Not rated		Not rated		Not rated	
UdE:							
Udorthents	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	0.50	Unstable excavation walls	0.10	Large stones	0.92
Urban land	35	Not rated		Not rated		Not rated	
UnB:							
Unison	90	Very limited		Very limited		Not limited	
		Low strength	1.00	Unstable excavation walls	1.00		
		Shrink-swell	0.50	Too clayey	0.12		
		Frost action	0.50				
UnC:							
Unison	80	Very limited		Very limited		Somewhat limited	
		Low strength	1.00	Unstable excavation walls	1.00	Slope	0.63
		Slope	0.63	Slope	0.63		
		Shrink-swell	0.50	Too clayey	0.12		
		Frost action	0.50				

Table 12.—Building Site Development, Part II—Continued

Map unit symbol and soil name	Pct. of map unit	Local roads and streets: Rating class and limiting features	Value	Shallow excavations: Rating class and limiting features	Value	Lawns and landscaping: Rating class and limiting features	Value
UoA:							
Udorthents, rarely flooded	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Frost action	0.50	Unstable excavation walls	0.10	Large stones	0.92
		Flooding	0.40				
Urban land, rarely flooded	30	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	

Table 13.—Sanitary Facilities, Part I

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
AkB:					
Alarka, occasionally flooded	65	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00	Slope	0.92
		Flooding	0.40	Flooding	0.40
Wesser, occasionally flooded	25	Very limited		Very limited	
		Flooding	1.00	Ponding	1.00
		Ponding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00
		Filtering capacity	1.00		
BkB2:					
Braddock, moderately eroded	80	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
		Slow water movement	0.50	Slope	0.68
BkC2:					
Braddock, moderately eroded	80	Very limited		Very limited	
		Seepage, bottom layer	1.00	Slope	1.00
		Slope	0.63	Seepage	1.00
		Slow water movement	0.50		
BkD2:					
Braddock, moderately eroded	85	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Slow water movement	0.50		

Table 13.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
BnC:					
Braddock	50	Very limited		Very limited	
		Seepage, bottom layer	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	1.00
		Slope	0.04		
Urban land	30	Not rated		Not rated	
BuC:					
Breakneck, very rocky, windswept	45	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Seepage, bottom layer	1.00	Slope	1.00
		Slope	0.63	Seepage	1.00
				Large stones	0.02
Pullback, very rocky, windswept	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Seepage, bottom layer	1.00	Slope	1.00
		Slope	0.63	Seepage	1.00
BuD:					
Breakneck, very rocky, windswept	65	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
				Large stones	0.02
Pullback, very rocky, windswept	15	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
BuE:					
Breakneck, very rocky, windswept	55	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
				Large stones	0.02
Pullback, very rocky, windswept	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00

Table 13.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
BuF:					
Breakneck, very rocky, windswept---	55	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
				Large stones	0.02
Pullback, very rocky, windswept---	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
ChE:					
Cheoah, stony-------	80	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Depth to bedrock	0.89	Depth to soft bedrock	0.71
ChF:					
Cheoah, stony-------	80	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Depth to bedrock	0.89	Depth to soft bedrock	0.71
CrD:					
Cheoah, rocky-------	65	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Depth to bedrock	0.45	Depth to soft bedrock	0.05
Jeffrey, rocky------	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
CrE:					
Cheoah, rocky-------	50	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Depth to bedrock	0.45	Depth to soft bedrock	0.05
Jeffrey, rocky------	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00

Table 13.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
CsF:					
Cheoah, very rocky	50	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Depth to bedrock	0.45	Depth to soft bedrock	0.05
Jeffrey, very rocky	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	1.00
CwA:					
Cullowhee, occasionally flooded	50	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to satuarated zone	1.00
		Filtering capacity	1.00		
Ela, occasionally flooded	40	Very limited		Very limited	
		Flooding	1.00	Ponding	1.00
		Ponding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00
DAM:					
Dam	100	Not rated		Not rated	
DeB:					
Dellwood, occasionally flooded	60	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00
		Filtering capacity	1.00	Slope	0.08
		Large stones	0.02		
Reddies, occasionally flooded	20	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00
				Slope	0.08

Table 13.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
DrB:					
Dillard, rarely flooded	80	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00
		Slow water movement	0.50	Flooding	0.40
		Flooding	0.40	Slope	0.08
DtD:					
Ditney, very stony	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Unicoi, very stony	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Large stones	0.76	Large stones	1.00
Rock outcrop	20	Not rated		Not rated	
DtE:					
Ditney, very stony	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Unicoi, very stony	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Large stones	0.25	Large stones	0.99
Rock outcrop	20	Not rated		Not rated	
DtF:					
Ditney, very stony	40	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Unicoi, very stony	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Large stones	0.53	Large stones	1.00
Rock outcrop	20	Not rated		Not rated	

Table 13.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
EtA:					
Ela, occasionally flooded	80	Very limited		Very limited	
		Flooding	1.00	Ponding	1.00
		Ponding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00
Ela, undrained	10	Very limited		Very limited	
		Flooding	1.00	Ponding	1.00
		Ponding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00
FvA:					
Fluvaquents, ponded	90	Very limited		Very limited	
		Flooding	1.00	Ponding	1.00
		Ponding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00		
HcD:					
Heintooga, bouldery	55	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones	1.00	Large stones	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Chiltoskie, bouldery	35	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
HdE:					
Heintooga, very bouldery	55	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones	1.00	Large stones	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Chiltoskie, very bouldery	35	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00

Table 13.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
HmA:					
Hemphill, rarely flooded	75	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Flooding	0.40
		Flooding	0.40		
Hemphill, undrained	5	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Flooding	0.40
		Flooding	0.40		
JbC:					
Junaluska	50	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Seepage, bottom layer	1.00	Slope	1.00
		Slope	0.63	Seepage	1.00
Brasstown	40	Somewhat limited		Very limited	
		Depth to bedrock	0.94	Slope	1.00
		Slope	0.63	Seepage	0.84
		Slow water movement	0.50	Depth to soft bedrock	0.50
JbD:					
Junaluska	50	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Brasstown	40	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	0.94	Depth to soft bedrock	0.84
		Slow water movement	0.50	Seepage	0.50
JbE:					
Junaluska	50	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Brasstown	40	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Depth to bedrock	0.94	Depth to soft bedrock	0.84
		Slow water movement	0.50	Seepage	0.50

Table 13.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
JnD:					
Junaluska	40	Not rated		Not rated	
Brasstown	30	Not rated		Not rated	
Urban land	25	Not rated		Not rated	
JtD:					
Junaluska	65	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Tsali	25	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.50
JtE:					
Junaluska	65	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Tsali	25	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.50
JtF:					
Junaluska	65	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Tsali	25	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
				Seepage	0.50
LnC:					
Lonon, bouldery	65	Somewhat limited		Very limited	
		Slope	0.63	Slope	1.00
		Slow water movement	0.50	Seepage	0.50
Northcove, bouldery	20	Very limited		Very limited	
		Seepage, bottom layer	1.00	Slope	1.00
		Large stones	0.84	Seepage	1.00
		Slope	0.63	Large stones	1.00

Table 13.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
LnD:					
Lonon, bouldery-----	65	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	0.50
Northcove, bouldery-	20	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
				Large stones	1.00
		Large stones	0.84		
LtD:					
Luftee, very rocky, windswept----------	55	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00		
		Seepage, bottom layer	1.00	Slope	1.00
				Seepage	1.00
		Large stones	0.57	Large stones	1.00
Anakeesta, very rocky, windswept---	30	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
				Large stones	0.99
		Depth to bedrock	0.94	Depth to hard bedrock	0.84
		Large stones	0.49		
LtE:					
Luftee, very rocky, windswept----------	55	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00		
		Seepage, bottom layer	1.00	Slope	1.00
				Seepage	1.00
		Large stones	0.57	Large stones	1.00
Anakeesta, very rocky, windswept---	30	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
				Large stones	0.99
		Depth to bedrock	0.94	Depth to hard bedrock	0.84
		Large stones	0.49		
LtF:					
Luftee, very rocky, windswept----------	55	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00		
		Seepage, bottom layer	1.00	Slope	1.00
				Seepage	1.00
		Large stones	0.57	Large stones	1.00

Table 13.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
LtF:					
Anakeesta, very rocky, windswept	30	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Depth to bedrock	0.94	Large stones	0.99
		Large stones	0.49	Depth to hard bedrock	0.84
NtE:					
Northcove, very bouldery	55	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Large stones	0.98	Large stones	1.00
Lonon, very bouldery	40	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	0.50
RdA:					
Reddies, occasionally flooded	80	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00
SbE:					
Snowbird, stony	80	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Depth to bedrock	0.66	Depth to soft bedrock	0.23
		Slow water movement	0.50		
SbF:					
Snowbird, stony	80	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Depth to bedrock	0.66	Depth to soft bedrock	0.23
		Slow water movement	0.50		
ScD:					
Soco, stony	50	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00

Table 13.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
ScD:					
Stecoah, stony	40	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Depth to bedrock	0.94	Depth to soft bedrock	0.84
ScE:					
Soco, stony	45	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Stecoah, stony	35	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Depth to bedrock	0.94	Depth to soft bedrock	0.84
ScF:					
Soco, stony	45	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Stecoah, stony	35	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Depth to bedrock	0.94	Depth to soft bedrock	0.84
SdD:					
Soco, rocky	50	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Stecoah, rocky	35	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Depth to bedrock	0.94	Depth to soft bedrock	0.84
SdE:					
Soco, rocky	45	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Stecoah, rocky	35	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Depth to bedrock	0.94	Depth to soft bedrock	0.84

Table 13.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
SdF:					
Soco, rocky	45	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Stecoah, rocky	35	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Depth to bedrock	0.94	Depth to soft bedrock	0.84
SnD:					
Soco, stony, windswept	50	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Stecoah, stony, windswept	40	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Depth to bedrock	0.94	Depth to soft bedrock	0.84
SnE:					
Soco, stony, windswept	55	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to soft bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Stecoah, stony, windswept	35	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Depth to bedrock	0.94	Depth to soft bedrock	0.84
SpE:					
Spivey, very bouldery	50	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones	1.00	Large stones	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Santeetlah, very bouldery	40	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	1.00

Table 13.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
SpF:					
Spivey, very bouldery	50	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones	1.00	Large stones	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Santeetlah, very bouldery	40	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	1.00
SvC:					
Spivey, bouldery	50	Very limited		Very limited	
		Large stones	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Large stones	1.00
				Seepage	1.00
		Slope	0.63		
Whiteoak, bouldery	40	Somewhat limited		Very limited	
		Slope	0.63	Slope	1.00
		Slow water movement	0.50	Seepage	0.50
SvD:					
Spivey, bouldery	50	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Large stones	1.00	Large stones	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
Whiteoak, bouldery	40	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	0.50
SwB:					
Statler, rarely flooded	90	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
				Slope	0.68
		Slow water movement	0.50	Flooding	0.40
		Depth to saturated zone	0.43		
		Flooding	0.40		
SyD:					
Sylco, very rocky	60	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00		
		Seepage, bottom layer	1.00	Slope	1.00
				Seepage	1.00
		Large stones	0.77	Large stones	1.00

Table 13.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Value	Sewage lagoons: Rating class and limiting features	Value
SyD:					
Cataska, very rocky	30	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Depth to soft bedrock	1.00
		Seepage, bottom layer	1.00	Slope	1.00
		Large stones	0.50	Seepage	1.00
				Large stones	1.00
SyE:					
Sylco, very rocky	45	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Large stones	0.77	Large stones	1.00
Cataska, very rocky	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Depth to soft bedrock	1.00
		Seepage, bottom layer	1.00	Slope	1.00
		Large stones	0.50	Seepage	1.00
				Large stones	1.00
SyF:					
Sylco, very rocky	50	Very limited		Very limited	
		Slope	1.00	Depth to hard bedrock	1.00
		Depth to bedrock	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Large stones	0.77	Large stones	1.00
Cataska, very rocky	35	Very limited		Very limited	
		Depth to bedrock	1.00	Depth to hard bedrock	1.00
		Slope	1.00	Depth to soft bedrock	1.00
		Seepage, bottom layer	1.00	Slope	1.00
		Large stones	0.50	Seepage	1.00
				Large stones	1.00
ThB:					
Thurmont	55	Somewhat limited		Very limited	
		Depth to saturated zone	0.84	Seepage	1.00
		Slow water movement	0.50	Slope	0.68
				Depth to saturated zone	0.17
Dillard	35	Very limited		Very limited	
		Depth to saturated zone	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Depth to saturated zone	1.00
		Slow water movement	0.50	Slope	0.32

Table 13.—Sanitary Facilities, Part I—Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields: Rating class and limiting features	Septic tank absorption fields: Value	Sewage lagoons: Rating class and limiting features	Sewage lagoons: Value
UdD:					
Udorthents	50	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
				Slope	1.00
		Slope	0.04	Large stones	0.22
Urban land	40	Not rated		Not rated	
UdE:					
Udorthents	45	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
				Large stones	0.22
Urban land	35	Not rated		Not rated	
UnB:					
Unison	90	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
				Slope	0.68
		Slow water movement	0.50		
UnC:					
Unison	80	Very limited		Very limited	
		Seepage, bottom layer	1.00	Slope	1.00
				Seepage	1.00
		Slope	0.63		
		Slow water movement	0.50		
UoA:					
Udorthents, rarely flooded	60	Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00
				Flooding	0.40
		Flooding	0.40	Large stones	0.22
				Slope	0.08
Urban land, rarely flooded	30	Not rated		Not rated	
W:					
Water	100	Not rated		Not rated	

Table 13.—Sanitary Facilities, Part II

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
AkB:							
Alarka, occasionally flooded	65	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.50
		Too acid	1.00	Flooding	0.40	Too sandy	0.50
		Too sandy	0.50			Gravel content	0.09
		Flooding	0.40				
Wesser, occasionally flooded	25	Very limited		Very limited		Very limited	
		Ponding	1.00	Flooding	1.00	Ponding	1.00
		Flooding	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	1.00
		Too sandy	1.00	Depth to saturated zone	1.00	Too sandy	1.00
		Depth to saturated zone	1.00				
BkB2:							
Braddock, moderately eroded	80	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
		Seepage, bottom layer	1.00			Hard to compact	1.00
BkC2:							
Braddock, moderately eroded	80	Very limited		Somewhat limited		Very limited	
		Too clayey	1.00	Slope	0.63	Too clayey	1.00
		Seepage, bottom layer	1.00			Hard to compact	1.00
		Slope	0.63			Slope	0.63
BkD2:							
Braddock, moderately eroded	85	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	1.00			Too clayey	1.00
		Seepage, bottom layer	1.00			Hard to compact	1.00
BnC:							
Braddock	50	Very limited		Somewhat limited		Very limited	
		Too clayey	1.00	Slope	0.04	Too clayey	1.00
		Seepage, bottom layer	1.00			Hard to compact	1.00
		Slope	0.04			Slope	0.04
Urban land	30	Not rated		Not rated		Not rated	

Table 13.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
BuC:							
Breakneck, very rocky, windswept	45	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Depth to bedrock	1.00	Slope	0.63
		Slope	0.63	Slope	0.63	Seepage	0.52
Pullback, very rocky, windswept	40	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Slope	0.63
		Slope	0.63	Slope	0.63	Seepage	0.52
BuD:							
Breakneck, very rocky, windswept	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Depth to bedrock	1.00	Seepage	0.52
Pullback, very rocky, windswept	15	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.52
BuE:							
Breakneck, very rocky, windswept	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Depth to bedrock	1.00	Seepage	0.52
Pullback, very rocky, windswept	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.52
BuF:							
Breakneck, very rocky, windswept	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Depth to bedrock	1.00	Seepage	0.52
Pullback, very rocky, windswept	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.52

Table 13.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
ChE:							
Cheoah, stony	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	0.71
		Seepage, bottom layer	1.00	Depth to bedrock	0.71	Seepage	0.50
ChF:							
Cheoah, stony	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	0.71
		Seepage, bottom layer	1.00	Depth to bedrock	0.71	Seepage	0.50
CrD:							
Cheoah, rocky	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Seepage	1.00	Seepage	0.50
		Seepage, bottom layer	1.00	Depth to bedrock	0.05	Depth to bedrock	0.05
Jeffrey, rocky	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.21
CrE:							
Cheoah, rocky	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Seepage	1.00	Seepage	0.50
		Seepage, bottom layer	1.00	Depth to bedrock	0.05	Depth to bedrock	0.05
Jeffrey, rocky	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.21
CsF:							
Cheoah, very rocky	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Seepage	1.00	Seepage	0.50
		Seepage, bottom layer	1.00	Depth to bedrock	0.05	Depth to bedrock	0.05
Jeffrey, very rocky	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
				Seepage	1.00	Seepage	0.21
CwA:							
Cullowhee, occasionally flooded	50	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Too sandy	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.96
						Gravel content	0.40

Table 13.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Trench sanitary landfill: Value	Area sanitary landfill: Rating class and limiting features	Area sanitary landfill: Value	Daily cover for landfill: Rating class and limiting features	Daily cover for landfill: Value
CwA:							
Ela, occasionally flooded	40	Very limited		Very limited		Very limited	
		Ponding	1.00	Flooding	1.00	Ponding	1.00
		Flooding	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Gravel content	0.26
		Large stones	0.03			Large stones	0.03
DAM:							
Dam	100	Not rated		Not rated		Not rated	
DeB:							
Dellwood, occasionally flooded	60	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Too sandy	1.00
		Too sandy	1.00	Depth to saturated zone	1.00	Gravel content	0.90
		Depth to saturated zone	1.00			Large stones	0.19
		Large stones	0.19			Depth to saturated zone	0.09
Reddies, occasionally flooded	20	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Too sandy	1.00
		Too sandy	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.24
		Depth to saturated zone	1.00			Gravel content	0.24
DrB:							
Dillard, rarely flooded	80	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Seepage, bottom layer	1.00	Flooding	0.40	Depth to saturated zone	0.47
		Too clayey	0.50				
		Flooding	0.40				
DtD:							
Ditney, very stony	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.50
Unicoi, very stony	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Large stones	0.76
		Large stones	0.76			Seepage	0.50
Rock outcrop	20	Not rated		Not rated		Not rated	

Table 13.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
DtE:							
Ditney, very stony	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.50
Unicoi, very stony	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.50
		Large stones	0.25			Large stones	0.25
Rock outcrop	20	Not rated		Not rated		Not rated	
DtF:							
Ditney, very stony	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.50
Unicoi, very stony	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Large stones	0.53
		Large stones	0.53			Seepage	0.50
Rock outcrop	20	Not rated		Not rated		Not rated	
EtA:							
Ela, occasionally flooded	80	Very limited		Very limited		Very limited	
		Ponding	1.00	Flooding	1.00	Ponding	1.00
		Flooding	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Large stones	0.03
		Large stones	0.03				
Ela, undrained	10	Very limited		Very limited		Very limited	
		Ponding	1.00	Flooding	1.00	Ponding	1.00
		Flooding	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Seepage, bottom layer	1.00	Seepage		Seepage	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Large stones	0.03
		Large stones	0.03				
FvA:							
Fluvaquents, ponded	90	Very limited		Very limited		Very limited	
		Ponding	1.00	Flooding	1.00	Ponding	1.00
		Flooding	1.00	Ponding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		

Table 13.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
HcD:							
Heintooga, bouldery	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	1.00	Seepage	1.00	Large stones	1.00
		Seepage, bottom layer	1.00			Seepage	0.50
Chiltoskie, bouldery	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.50
HdE:							
Heintooga, very bouldery	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	1.00	Seepage	1.00	Large stones	1.00
		Seepage, bottom layer	1.00			Seepage	0.50
Chiltoskie, very bouldery	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.50
HmA:							
Hemphill, rarely flooded	75	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	0.40	Flooding	0.40		
Hemphill, undrained	5	Very limited		Very limited		Very limited	
		Ponding	1.00	Ponding	1.00	Ponding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	0.40	Flooding	0.40		
JbC:							
Junaluska	50	Very limited		Very limited		Very limited	
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Slope	0.63
		Slope	0.63	Slope	0.63	Seepage	0.50
Brasstown	40	Very limited		Somewhat limited		Somewhat limited	
		Depth to bedrock	1.00	Depth to bedrock	0.84	Depth to bedrock	0.84
		Slope	0.63	Slope	0.63	Slope	0.63
JbD:							
Junaluska	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00		
Brasstown	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	0.84	Depth to bedrock	0.84

Table 13.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
JbE:							
Junaluska-----------	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00		
Brasstown-----------	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	0.84	Depth to bedrock	0.84
JnD:							
Junaluska-----------	40	Not rated		Not rated		Not rated	
Brasstown-----------	30	Not rated		Not rated		Not rated	
Urban land----------	25	Not rated		Not rated		Not rated	
JtD:							
Junaluska-----------	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.50
Tsali---------------	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
JtE:							
Junaluska-----------	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.50
Tsali---------------	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
JtF:							
Junaluska-----------	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.50
Tsali---------------	25	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
LnC:							
Lonon, bouldery----	65	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
						Too clayey	0.50
Northcove, bouldery-	20	Very limited		Very limited		Somewhat limited	
		Seepage, bottom layer	1.00	Seepage	1.00	Large stones	0.98
		Large stones	0.98	Slope	0.63	Slope	0.63
		Slope	0.63			Seepage	0.50

Table 13.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
LnD:							
Lonon, bouldery-----	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Too clayey	0.50
Northcove, bouldery-	20	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Large stones	0.98
		Large stones	0.98			Seepage	0.50
LtD:							
Luftee, very rocky, windswept----------	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Depth to bedrock	1.00	Gravel content	0.62
		Large stones	0.57			Large stones	0.57
						Seepage	0.52
Anakeesta, very rocky, windswept---	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	0.84
		Seepage, bottom layer	1.00	Depth to bedrock	0.84	Gravel content	0.58
		Large stones	0.53			Large stones	0.53
						Seepage	0.52
LtE:							
Luftee, very rocky, windswept----------	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Depth to bedrock	1.00	Gravel content	0.62
		Large stones	0.57			Large stones	0.57
						Seepage	0.52
Anakeesta, very rocky, windswept---	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	0.84
		Seepage, bottom layer	1.00	Depth to bedrock	0.84	Gravel content	0.58
		Large stones	0.53			Large stones	0.53
						Seepage	0.52
LtF:							
Luftee, very rocky, windswept----------	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Depth to bedrock	1.00	Gravel content	0.62
		Large stones	0.57			Large stones	0.57
						Seepage	0.52
Anakeesta, very rocky, windswept---	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	0.84
		Seepage, bottom layer	1.00	Depth to bedrock	0.84	Gravel content	0.58
		Large stones	0.53			Large stones	0.53
						Seepage	0.52

Table 13.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
NtE:							
Northcove, very bouldery	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	1.00	Seepage	1.00	Large stones	1.00
		Seepage, bottom layer	1.00			Seepage	0.50
Lonon, very bouldery	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Too clayey	0.50
RdA:							
Reddies, occasionally flooded	80	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Seepage	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Too sandy	1.00
		Too sandy	1.00	Depth to saturated zone	1.00	Depth to saturated zone	0.24
		Depth to saturated zone	1.00			Gravel content	0.19
SbE:							
Snowbird, stony	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	0.23
		Seepage, bottom layer	1.00	Depth to bedrock	0.23		
SbF:							
Snowbird, stony	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	0.23
		Seepage, bottom layer	1.00	Depth to bedrock	0.23		
ScD:							
Soco, stony	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.50
Stecoah, stony	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	0.84
		Seepage, bottom layer	1.00	Depth to bedrock	0.84	Seepage	0.50
ScE:							
Soco, stony	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.50
Stecoah, stony	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	0.84
		Seepage, bottom layer	1.00	Depth to bedrock	0.84	Seepage	0.50

Table 13.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
ScF:							
Soco, stony	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.50
Stecoah, stony	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	0.84
		Seepage, bottom layer	1.00	Depth to bedrock	0.84	Seepage	0.50
SdD:							
Soco, rocky	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.50
Stecoah, rocky	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	0.84
		Seepage, bottom layer	1.00	Depth to bedrock	0.84	Seepage	0.50
SdE:							
Soco, rocky	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.50
Stecoah, rocky	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	0.84
		Seepage, bottom layer	1.00	Depth to bedrock	0.84	Seepage	0.50
SdF:							
Soco, rocky	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.50
Stecoah, rocky	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	0.84
		Seepage, bottom layer	1.00	Depth to bedrock	0.84	Seepage	0.50
SnD:							
Soco, stony, windswept	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.50

Table 13.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
SnD:							
Stecoah, stony, windswept	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	0.84
		Seepage, bottom layer	1.00	Depth to bedrock	0.84	Seepage	0.50
SnE:							
Soco, stony, windswept	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.50
Stecoah, stony, windswept	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	0.84
		Seepage, bottom layer	1.00	Depth to bedrock	0.84	Seepage	0.50
SpE:							
Spivey, very bouldery	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	1.00	Seepage	1.00	Large stones	1.00
		Seepage, bottom layer	1.00			Seepage	0.21
Santeetlah, very bouldery	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
SpF:							
Spivey, very bouldery	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	1.00	Seepage	1.00	Large stones	1.00
		Seepage, bottom layer	1.00			Seepage	0.21
Santeetlah, very bouldery	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
SvC:							
Spivey, bouldery	50	Very limited		Very limited		Very limited	
		Large stones	1.00	Seepage	1.00	Large stones	1.00
		Seepage, bottom layer	1.00	Slope	0.63	Slope	0.63
		Slope	0.63			Seepage	0.21
Whiteoak, bouldery	40	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63

Table 13.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Trench sanitary landfill: Value	Area sanitary landfill: Rating class and limiting features	Area sanitary landfill: Value	Daily cover for landfill: Rating class and limiting features	Daily cover for landfill: Value
SvD:							
Spivey, bouldery	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Large stones	1.00	Seepage	1.00	Large stones	1.00
		Seepage, bottom layer	1.00			Seepage	0.21
Whiteoak, bouldery	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
SwB:							
Statler, rarely flooded	90	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Seepage, bottom layer	1.00	Flooding	0.40	Seepage	0.21
		Too clayey	0.50				
		Flooding	0.40				
SyD:							
Sylco, very rocky	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Large stones	0.77
		Large stones	0.77			Seepage	0.21
Cataska, very rocky	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	1.00
		Large stones	0.50			Large stones	0.50
SyE:							
Sylco, very rocky	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Large stones	0.77
		Large stones	0.77			Seepage	0.21
Cataska, very rocky	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	1.00
		Large stones	0.50			Large stones	0.50
SyF:							
Sylco, very rocky	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Seepage	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Depth to bedrock	1.00	Large stones	0.77
		Large stones	0.77			Seepage	0.21

Table 13.—Sanitary Facilities, Part II—Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill: Rating class and limiting features	Value	Area sanitary landfill: Rating class and limiting features	Value	Daily cover for landfill: Rating class and limiting features	Value
SyF:							
Cataska, very rocky	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	1.00
		Large stones	0.50			Large stones	0.50
ThB:							
Thurmont	55	Very limited		Very limited		Not limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
Dillard	35	Very limited		Very limited		Somewhat limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Seepage, bottom layer	1.00			Depth to saturated zone	0.47
		Too clayey	0.50				
UdD:							
Udorthents	50	Very limited		Very limited		Somewhat limited	
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.50
		Slope	0.04	Slope	0.04	Slope	0.04
Urban land	40	Not rated		Not rated		Not rated	
UdE:							
Udorthents	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.50
Urban land	35	Not rated		Not rated		Not rated	
UnB:							
Unison	90	Very limited		Not limited		Very limited	
		Too clayey	1.00			Too clayey	1.00
		Seepage, bottom layer	1.00			Hard to compact	1.00
UnC:							
Unison	80	Very limited		Somewhat limited		Very limited	
		Too clayey	1.00	Slope	0.63	Too clayey	1.00
		Seepage, bottom layer	1.00			Hard to compact	1.00
		Slope	0.63			Slope	0.63
UoA:							
Udorthents, rarely flooded	60	Very limited		Very limited		Somewhat limited	
		Seepage, bottom layer	1.00	Seepage	1.00	Seepage	0.50
		Flooding	0.40	Flooding	0.40		
Urban land, rarely flooded	30	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	

Table 14.—Construction Materials, Part I

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
AkB:					
Alarka, occasionally flooded	65	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.22	Bottom layer	0.08
Wesser, occasionally flooded	25	Poor		Poor	
		Thickest layer	0.00	Thickest layer	0.02
		Bottom layer	0.71	Bottom layer	0.33
BkB2:					
Braddock, moderately eroded	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BkC2:					
Braddock, moderately eroded	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BkD2:					
Braddock, moderately eroded	85	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BnC:					
Braddock	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Urban land	30	Not rated		Not rated	
BuC:					
Breakneck, very rocky, windswept	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Pullback, very rocky, windswept	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 14.—Construction Materials, Part I—Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
BuD:					
Breakneck, very rocky, windswept	65	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Pullback, very rocky, windswept	15	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BuE:					
Breakneck, very rocky, windswept	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Pullback, very rocky, windswept	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
BuF:					
Breakneck, very rocky, windswept	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Pullback, very rocky, windswept	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
ChE:					
Cheoah, stony	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
ChF:					
Cheoah, stony	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
CrD:					
Cheoah, rocky	65	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.02
Jeffrey, rocky	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
CrE:					
Cheoah, rocky	50	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.02
Jeffrey, rocky	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 14.—Construction Materials, Part I—Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
CsF:					
Cheoah, very rocky	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Jeffrey, very rocky	40	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.05
CwA:					
Cullowhee, occasionally flooded	50	Poor		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.79
Ela, occasionally flooded	40	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.03	Bottom layer	0.03
DAM:					
Dam	100	Not rated		Not rated	
DeB:					
Dellwood, occasionally flooded	60	Poor		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.54
Reddies, occasionally flooded	20	Poor		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.79
DrB:					
Dillard, rarely flooded	80	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.04
DtD:					
Ditney, very stony	40	Poor		Fair	
		Bottom layer	0.00	Bottom layer	0.02
		Thickest layer	0.00	Thickest layer	0.02
Unicoi, very stony	35	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.04
Rock outcrop	20	Not rated		Not rated	
DtE:					
Ditney, very stony	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 14.—Construction Materials, Part I—Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
DtE:					
Unicoi, very stony	35	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.01
Rock outcrop	20	Not rated		Not rated	
DtF:					
Ditney, very stony	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Unicoi, very stony	35	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.01
Rock outcrop	20	Not rated		Not rated	
EtA:					
Ela, occasionally flooded	80	Poor		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.03
Ela, undrained	10	Poor		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.03
FvA:					
Fluvaquents, ponded	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
HcD:					
Heintooga, bouldery	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Chiltoskie, bouldery	35	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.04
HdE:					
Heintooga, very bouldery	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Chiltoskie, very bouldery	35	Poor		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.04
HmA:					
Hemphill, rarely flooded	75	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 14.—Construction Materials, Part I—Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
HmA:					
Hemphill, undrained	5	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
JbC:					
Junaluska	50	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.01
Brasstown	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
JbD:					
Junaluska	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Brasstown	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
JbE:					
Junaluska	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Brasstown	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
JnD:					
Junaluska	40	Not rated		Not rated	
Brasstown	30	Not rated		Not rated	
Urban land	25	Not rated		Not rated	
JtD:					
Junaluska	65	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Tsali	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
JtE:					
Junaluska	65	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Tsali	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 14.—Construction Materials, Part I—Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
JtF:					
Junaluska	65	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Tsali	25	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
LnC:					
Lonon, bouldery	65	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Northcove, bouldery	20	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.06	Bottom layer	0.03
LnD:					
Lonon, bouldery	65	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Northcove, bouldery	20	Fair		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.06	Bottom layer	0.03
LtD:					
Luftee, very rocky, windswept	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Anakeesta, very rocky, windswept	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
LtE:					
Luftee, very rocky, windswept	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Anakeesta, very rocky, windswept	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
LtF:					
Luftee, very rocky, windswept	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Anakeesta, very rocky, windswept	30	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 14.—Construction Materials, Part I—Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
NtE:					
Northcove, very bouldery	55	Poor		Poor	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.00
Lonon, very bouldery	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
RdA:					
Reddies, occasionally flooded	80	Poor		Fair	
		Thickest layer	0.00	Thickest layer	0.00
		Bottom layer	0.00	Bottom layer	0.79
SbE:					
Snowbird, stony	80	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.01
SbF:					
Snowbird, stony	80	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.01
ScD:					
Soco, stony	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Stecoah, stony	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
ScE:					
Soco, stony	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Stecoah, stony	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
ScF:					
Soco, stony	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Stecoah, stony	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SdD:					
Soco, rocky	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 14.—Construction Materials, Part I—Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
SdD:					
Stecoah, rocky------	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SdE:					
Soco, rocky---------	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Stecoah, rocky------	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SdF:					
Soco, rocky---------	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Stecoah, rocky------	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SnD:					
Soco, stony, windswept----------	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Stecoah, stony, windswept----------	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SnE:					
Soco, stony, windswept----------	55	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Stecoah, stony, windswept----------	35	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SpE:					
Spivey, very bouldery-----------	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Santeetlah, very bouldery-----------	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00

Table 14.—Construction Materials, Part I—Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
SpF:					
Spivey, very bouldery	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Santeetlah, very bouldery	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SvC:					
Spivey, bouldery	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Whiteoak, bouldery	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SvD:					
Spivey, bouldery	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Whiteoak, bouldery	40	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SwB:					
Statler, rarely flooded	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
SyD:					
Sylco, very rocky	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Cataska, very rocky	30	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
SyE:					
Sylco, very rocky	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Cataska, very rocky	35	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
SyF:					
Sylco, very rocky	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Cataska, very rocky	35	Poor		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00

Table 14.—Construction Materials, Part I—Continued

Map symbol and soil name	Pct. of map unit	Potential source of gravel: Rating class	Value	Potential source of sand: Rating class	Value
ThB:					
Thurmont	55	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.03
Dillard	35	Poor		Fair	
		Bottom layer	0.00	Thickest layer	0.00
		Thickest layer	0.00	Bottom layer	0.04
UdD:					
Udorthents	50	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Urban land	40	Not rated		Not rated	
UdE:					
Udorthents	45	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Urban land	35	Not rated		Not rated	
UnB:					
Unison	90	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
UnC:					
Unison	80	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
UoA:					
Udorthents, rarely flooded	60	Poor		Poor	
		Bottom layer	0.00	Bottom layer	0.00
		Thickest layer	0.00	Thickest layer	0.00
Urban land, rarely flooded	30	Not rated		Not rated	
W:					
Water	100	Not rated		Not rated	

Table 14.—Construction Materials, Part II

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
AkB:							
Alarka, occasionally flooded	65	Fair		Poor		Poor	
		Too acid	0.50	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.50			Hard to reclaim (rock fragments)	0.00
		Stone content	0.52			Too acid	0.68
		Water erosion	0.99				
Wesser, occasionally flooded	25	Poor		Poor		Poor	
		Too sandy	0.00	Wetness	0.00	Wetness	0.00
		Too acid	0.50			Rock fragments	0.00
						Too sandy	0.00
						Hard to reclaim (rock fragments)	0.00
						Too acid	0.59
BkB2:							
Braddock, moderately eroded	80	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Too acid	0.12	Shrink-swell	0.90	Too acid	0.59
		Low content of organic matter	0.50			Rock fragments	0.68
BkC2:							
Braddock, moderately eroded	80	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Too acid	0.12	Shrink-swell	0.90	Slope	0.37
		Low content of organic matter	0.50			Too acid	0.59
						Rock fragments	0.68
BkD2:							
Braddock, moderately eroded	85	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Slope	0.00
		Too acid	0.12	Slope	0.08	Too clayey	0.00
		Low content of organic matter	0.50	Shrink-swell	0.90	Too acid	0.59
						Rock fragments	0.82
BnC:							
Braddock	50	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Too acid	0.12	Shrink-swell	0.90	Too acid	0.59
		Low content of organic matter	0.50			Rock fragments	0.68
						Slope	0.96
Urban land	30	Not rated		Not rated		Not rated	

Table 14.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
BuC:							
Breakneck, very rocky, windswept---	45	Fair		Poor		Fair	
		Too acid	0.50	Depth to bedrock	0.00	Rock fragments	0.04
		Depth to bedrock	0.35	Cobble content	0.79	Too acid	0.12
		Droughty	0.21			Depth to bedrock	0.35
						Slope	0.37
Pullback, very rocky, windswept---	40	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00			Too acid	0.12
		Too acid	0.50			Slope	0.37
						Rock fragments	0.68
BuD:							
Breakneck, very rocky, windswept---	65	Fair		Poor		Poor	
		Droughty	0.21	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.35	Slope	0.08	Rock fragments	0.04
		Too acid	0.50	Cobble content	0.79	Too acid	0.12
						Depth to bedrock	0.35
Pullback, very rocky, windswept---	15	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.08	Slope	0.00
		Too acid	0.50			Too acid	0.12
						Rock fragments	0.68
BuE:							
Breakneck, very rocky, windswept---	55	Fair		Poor		Poor	
		Droughty	0.21	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.35	Slope	0.00	Rock fragments	0.04
		Too acid	0.50	Cobble content	0.79	Too acid	0.12
						Depth to bedrock	0.35
Pullback, very rocky, windswept---	30	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.00	Slope	0.00
		Too acid	0.50			Too acid	0.12
						Rock fragments	0.76
BuF:							
Breakneck, very rocky, windswept---	55	Fair		Poor		Poor	
		Droughty	0.21	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.35	Slope	0.00	Rock fragments	0.04
		Too acid	0.50	Cobble content	0.79	Too acid	0.12
						Depth to bedrock	0.35
Pullback, very rocky, windswept---	30	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.00	Slope	0.00
		Too acid	0.50			Too acid	0.12
						Rock fragments	0.76

Table 14.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
ChE:							
Cheoah, stony	80	Fair		Poor		Poor	
		Too acid	0.50	Slope	0.00	Slope	0.00
		Low content of organic matter	0.50	Depth to bedrock	0.29	Hard to reclaim (rock fragments)	0.24
						Rock fragments	0.47
						Too acid	0.50
ChF:							
Cheoah, stony	80	Fair		Poor		Poor	
		Too acid	0.50	Slope	0.00	Slope	0.00
		Low content of organic matter	0.50	Depth to bedrock	0.29	Hard to reclaim (rock fragments)	0.24
						Too acid	0.50
						Rock fragments	0.73
CrD:							
Cheoah, rocky	65	Fair		Fair		Poor	
		Too acid	0.08	Slope	0.08	Slope	0.00
		Too sandy	0.98	Depth to bedrock	0.95	Hard to reclaim (rock fragments)	0.24
						Too acid	0.50
						Rock fragments	0.85
						Too sandy	0.98
Jeffrey, rocky	30	Fair		Poor		Poor	
		Droughty	0.05	Depth to bedrock	0.00	Slope	0.00
		Too acid	0.50	Slope	0.08	Rock fragments	0.30
		Depth to bedrock	0.71	Cobble content	0.97	Depth to bedrock	0.71
						Too acid	0.88
CrE:							
Cheoah, rocky	50	Fair		Poor		Poor	
		Too acid	0.08	Slope	0.00	Slope	0.00
		Too sandy	0.98	Depth to bedrock	0.95	Hard to reclaim (rock fragments)	0.24
						Too acid	0.50
						Rock fragments	0.85
						Too sandy	0.98
Jeffrey, rocky	40	Fair		Poor		Poor	
		Droughty	0.05	Depth to bedrock	0.00	Slope	0.00
		Too acid	0.50	Slope	0.00	Rock fragments	0.30
		Depth to bedrock	0.71	Cobble content	0.97	Depth to bedrock	0.71
						Too acid	0.88
CsF:							
Cheoah, very rocky	50	Fair		Poor		Poor	
		Too acid	0.08	Slope	0.00	Slope	0.00
				Depth to bedrock	0.95	Hard to reclaim (rock fragments)	0.24
						Too acid	0.50
						Rock fragments	0.53
Jeffrey, very rocky	40	Fair		Poor		Poor	
		Droughty	0.18	Depth to bedrock	0.00	Slope	0.00
		Too acid	0.50	Slope	0.00	Rock fragments	0.24
		Depth to bedrock	0.84	Cobble content	0.96	Depth to bedrock	0.84
						Too acid	0.88

Table 14.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
CwA:							
Cullowhee, occasionally flooded	50	Fair		Fair		Poor	
		Low content of organic matter	0.12	Wetness	0.32	Hard to reclaim (rock fragments)	0.00
		Too acid	0.74			Wetness	0.32
		Droughty	0.94			Rock fragments	0.82
Ela, occasionally flooded	40	Fair		Poor		Poor	
		Low content of organic matter	0.12	Wetness	0.00	Wetness	0.00
		Too acid	0.68			Hard to reclaim (rock fragments)	0.00
		Stone content	0.91			Rock fragments	0.76
		Water erosion	0.99				
DAM:							
Dam	100	Not rated		Not rated		Not rated	
DeB:							
Dellwood, occasionally flooded	60	Poor		Fair		Poor	
		Too sandy	0.00	Cobble content	0.84	Rock fragments	0.00
		Droughty	0.12	Stones	0.91	Too sandy	0.00
		Low content of organic matter	0.50			Hard to reclaim (rock fragments)	0.00
		Stone content	0.67				
		Too acid	0.88				
Reddies, occasionally flooded	20	Fair		Fair		Poor	
		Low content of organic matter	0.12	Wetness	0.98	Hard to reclaim (rock fragments)	0.00
		Too acid	0.88			Rock fragments	0.82
		Droughty	0.97			Wetness	0.98
DrB:							
Dillard, rarely flooded	80	Fair		Poor		Fair	
		Too acid	0.32	Low strength	0.00	Too acid	0.88
		Low content of organic matter	0.50	Wetness	0.89	Wetness	0.89
DtD:							
Ditney, very stony	40	Fair		Poor		Poor	
		Droughty	0.07	Depth to bedrock	0.00	Slope	0.00
		Too acid	0.50	Slope	0.08	Depth to bedrock	0.54
		Low content of organic matter	0.50			Too acid	0.59
		Depth to bedrock	0.54			Rock fragments	0.91
Unicoi, very stony	35	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Stones	0.00	Slope	0.00
		Stone content	0.00	Slope	0.08	Rock fragments	0.00
		Too acid	0.50	Cobble content	0.48	Too acid	0.59
		Low content of organic matter	0.50				

Table 14.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
DtD:							
Rock outcrop	20	Not rated		Not rated		Not rated	
DtE:							
Ditney, very stony	40	Fair		Poor		Poor	
		Droughty	0.14	Depth to bedrock	0.00	Slope	0.00
		Too acid	0.50	Slope	0.00	Depth to bedrock	0.54
		Low content of organic matter	0.50			Rock fragments	0.58
						Too acid	0.59
		Depth to bedrock	0.54				
Unicoi, very stony	35	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.00	Slope	0.00
		Stone content	0.17	Stones	0.17	Rock fragments	0.05
		Too acid	0.50	Cobble content	0.77	Too acid	0.59
		Low content of organic matter	0.50				
Rock outcrop	20	Not rated		Not rated		Not rated	
DtF:							
Ditney, very stony	40	Fair		Poor		Poor	
		Droughty	0.14	Depth to bedrock	0.00	Slope	0.00
		Too acid	0.50	Slope	0.00	Depth to bedrock	0.54
		Low content of organic matter	0.50			Rock fragments	0.58
						Too acid	0.59
		Depth to bedrock	0.54				
Unicoi, very stony	35	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.00	Slope	0.00
		Stone content	0.00	Stones	0.00	Rock fragments	0.02
		Too acid	0.50	Cobble content	0.67	Too acid	0.59
		Low content of organic matter	0.50				
Rock outcrop	20	Not rated		Not rated		Not rated	
EtA:							
Ela, occasionally flooded	80	Fair		Poor		Poor	
		Low content of organic matter	0.12	Wetness	0.00	Wetness	0.00
						Hard to reclaim (rock fragments)	0.00
		Too acid	0.68				
		Stone content	0.95			Rock fragments	0.70
Ela, undrained	10	Fair		Poor		Poor	
		Low content of organic matter	0.12	Wetness	0.00	Wetness	0.00
						Hard to reclaim (rock fragments)	0.00
		Too acid	0.68				
		Stone content	0.95			Rock fragments	0.70
FvA:							
Fluvaquents, ponded	90	Fair		Poor		Poor	
		Low content of organic matter	0.12	Wetness	0.00	Wetness	0.00
						Too acid	0.88
		Too acid	0.50				

Table 14.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
HcD:							
Heintooga, bouldery	55	Poor		Poor		Poor	
		Stone content	0.00	Cobble content	0.00	Hard to reclaim (rock fragments)	0.00
		Droughty	0.42	Stones	0.00		
		Too acid	0.50	Slope	0.08	Rock fragments	0.00
		Low content of organic matter	0.50			Slope	0.00
						Too acid	0.82
		Cobble content	0.51				
Chiltoskie, bouldery	35	Poor		Fair		Poor	
		Too acid	0.00	Slope	0.08	Slope	0.00
		Low content of organic matter	0.50			Hard to reclaim (rock fragments)	0.02
		Stone content	0.84			Too acid	0.59
						Rock fragments	0.97
HdE:							
Heintooga, very bouldery	55	Poor		Poor		Poor	
		Stone content	0.00	Slope	0.00	Hard to reclaim (rock fragments)	0.00
		Droughty	0.42	Cobble content	0.00		
		Too acid	0.50	Stones	0.00	Rock fragments	0.00
		Low content of organic matter	0.50			Slope	0.00
						Too acid	0.82
		Cobble content	0.51				
Chiltoskie, very bouldery	35	Poor		Poor		Poor	
		Too acid	0.00	Slope	0.00	Slope	0.00
		Low content of organic matter	0.50			Hard to reclaim (rock fragments)	0.00
						Too acid	0.59
						Rock fragments	0.97
HmA:							
Hemphill, rarely flooded	75	Fair		Poor		Poor	
		Too clayey	0.02	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.50			Too clayey	0.01
		Too acid	0.88				
Hemphill, undrained	5	Fair		Poor		Poor	
		Too clayey	0.02	Wetness	0.00	Wetness	0.00
		Low content of organic matter	0.50			Too clayey	0.01
		Too acid	0.88				
JbC:							
Junaluska	50	Fair		Poor		Fair	
		Too acid	0.50	Depth to bedrock	0.00	Slope	0.37
		Low content of organic matter	0.50	Stones	0.99	Too acid	0.67
						Rock fragments	0.82
		Droughty	0.80			Depth to bedrock	0.93
		Depth to bedrock	0.93				
		Stone content	0.99				

Table 14.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
JbC:							
Brasstown-----------	40	Fair		Poor		Fair	
		Too acid	0.50	Low strength	0.00	Slope	0.37
		Low content of organic matter	0.50	Depth to bedrock	0.16	Too acid	0.76
						Rock fragments	0.95
		Water erosion	0.99				
JbD:							
Junaluska-----------	50	Fair		Poor		Poor	
		Depth to bedrock	0.21	Depth to bedrock	0.00	Slope	0.00
		Droughty	0.28	Slope	0.08	Depth to bedrock	0.21
		Too acid	0.50			Too acid	0.76
		Low content of organic matter	0.50				
Brasstown-----------	40	Fair		Poor		Poor	
		Too acid	0.50	Low strength	0.00	Slope	0.00
		Low content of organic matter	0.50	Slope	0.08	Too acid	0.76
				Depth to bedrock	0.16	Rock fragments	0.95
		Water erosion	0.99				
JbE:							
Junaluska-----------	50	Fair		Poor		Poor	
		Depth to bedrock	0.21	Depth to bedrock	0.00	Slope	0.00
		Droughty	0.28	Slope	0.00	Depth to bedrock	0.21
		Too acid	0.50			Too acid	0.76
		Low content of organic matter	0.50				
Brasstown-----------	40	Fair		Poor		Poor	
		Too acid	0.50	Slope	0.00	Slope	0.00
		Low content of organic matter	0.50	Low strength	0.00	Too acid	0.76
				Depth to bedrock	0.16	Rock fragments	0.95
		Water erosion	0.99				
JnD:							
Junaluska-----------	40	Not rated		Not rated		Not rated	
Brasstown-----------	30	Not rated		Not rated		Not rated	
Urban land----------	25	Not rated		Not rated		Not rated	
JtD:							
Junaluska-----------	65	Fair		Poor		Poor	
		Too acid	0.50	Depth to bedrock	0.00	Slope	0.00
		Droughty	0.80	Slope	0.08	Too acid	0.76
		Low content of organic matter	0.88			Depth to bedrock	0.93
		Depth to bedrock	0.93				
Tsali---------------	25	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.08	Slope	0.00
		Too acid	0.50	Low strength	0.22	Rock fragments	0.61
						Too acid	0.76

Table 14.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
JtE:							
Junaluska	65	Fair		Poor		Poor	
		Too acid	0.50	Depth to bedrock	0.00	Slope	0.00
		Droughty	0.80	Slope	0.00	Too acid	0.76
		Low content of organic matter	0.88			Depth to bedrock	0.93
		Depth to bedrock	0.93				
Tsali	25	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.00	Slope	0.00
		Too acid	0.50	Low strength	0.22	Rock fragments	0.61
						Too acid	0.76
JtF:							
Junaluska	65	Fair		Poor		Poor	
		Too acid	0.50	Depth to bedrock	0.00	Slope	0.00
		Droughty	0.80	Slope	0.00	Too acid	0.76
		Low content of organic matter	0.88			Depth to bedrock	0.93
		Depth to bedrock	0.93				
Tsali	25	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Depth to bedrock	0.00
		Depth to bedrock	0.00	Slope	0.00	Slope	0.00
		Too acid	0.50	Low strength	0.22	Rock fragments	0.61
						Too acid	0.76
LnC:							
Lonon, bouldery	65	Fair		Fair		Fair	
		Low content of organic matter	0.12	Low strength	0.78	Hard to reclaim (rock fragments)	0.08
		Too acid	0.20			Slope	0.37
						Rock fragments	0.54
						Too acid	0.76
Northcove, bouldery	20	Poor		Fair		Poor	
		Stone content	0.00	Stones	0.02	Rock fragments	0.00
		Low content of organic matter	0.12	Cobble content	0.19	Hard to reclaim (rock fragments)	0.00
		Too acid	0.50			Slope	0.37
		Droughty	0.66			Too acid	0.76
		Cobble content	0.90				
LnD:							
Lonon, bouldery	65	Fair		Fair		Poor	
		Low content of organic matter	0.12	Slope	0.08	Slope	0.00
		Too acid	0.20	Low strength	0.78	Hard to reclaim (rock fragments)	0.08
						Rock fragments	0.54
						Too acid	0.76
Northcove, bouldery	20	Poor		Fair		Poor	
		Stone content	0.00	Stones	0.02	Slope	0.00
		Low content of organic matter	0.12	Slope	0.08	Rock fragments	0.00
		Too acid	0.50	Cobble content	0.19	Hard to reclaim (rock fragments)	0.00
		Droughty	0.66			Too acid	0.76
		Cobble content	0.90				

Table 14.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
LtD:							
Luftee, very rocky, windswept----------	55	Fair		Poor		Poor	
		Droughty	0.34	Depth to bedrock	0.00	Rock fragments	0.00
		Cobble content	0.44	Cobble content	0.00	Slope	0.00
		Too acid	0.50	Slope	0.08	Too acid	0.24
		Depth to bedrock	0.84			Depth to bedrock	0.84
Anakeesta, very rocky, windswept---	30	Fair		Poor		Poor	
		Cobble content	0.47	Cobble content	0.00	Hard to reclaim (rock fragments)	0.00
		Too acid	0.50	Slope	0.08		
		Droughty	0.96	Depth to bedrock	0.16	Rock fragments	0.00
			0.96			Slope	0.00
						Too acid	0.24
LtE:							
Luftee, very rocky, windswept----------	55	Fair		Poor		Poor	
		Droughty	0.34	Depth to bedrock	0.00	Rock fragments	0.00
		Cobble content	0.44	Slope	0.00	Slope	0.00
		Too acid	0.50	Cobble content	0.00	Too acid	0.24
		Depth to bedrock	0.84			Depth to bedrock	0.84
Anakeesta, very rocky, windswept---	30	Fair		Poor		Poor	
		Cobble content	0.47	Slope	0.00	Hard to reclaim (rock fragments)	0.00
		Too acid	0.50	Cobble content	0.00		
		Droughty	0.96	Depth to bedrock	0.16	Rock fragments	0.00
						Slope	0.00
						Too acid	0.24
LtF:							
Luftee, very rocky, windswept----------	55	Fair		Poor		Poor	
		Droughty	0.34	Depth to bedrock	0.00	Rock fragments	0.00
		Cobble content	0.44	Slope	0.00	Slope	0.00
		Too acid	0.50	Cobble content	0.00	Too acid	0.24
		Depth to bedrock	0.84			Depth to bedrock	0.84
Anakeesta, very rocky, windswept---	30	Fair		Poor		Poor	
		Cobble content	0.47	Slope	0.00	Slope	0.00
		Too acid	0.50	Cobble content	0.00	Rock fragments	0.00
		Droughty	0.96	Depth to bedrock	0.16	Hard to reclaim (rock fragments)	0.00
						Too acid	0.24
NtE:							
Northcove, very bouldery-----------	55	Poor		Poor		Poor	
		Stone content	0.00	Slope	0.00	Slope	0.00
		Low content of organic matter	0.12	Stones	0.00	Rock fragments	0.00
				Cobble content	0.36	Hard to reclaim (rock fragments)	0.05
		Too acid	0.50				
		Droughty	0.66			Too acid	0.76

Table 14.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
NtE:							
Lonon, very bouldery	40	Fair		Poor		Poor	
		Low content of organic matter	0.12	Slope	0.00	Slope	0.00
		Too acid	0.20	Low strength	0.78	Hard to reclaim (rock fragments)	0.08
						Rock fragments	0.54
						Too acid	0.76
RdA:							
Reddies, occasionally flooded	80	Fair		Fair		Poor	
		Low content of organic matter	0.12	Wetness	0.98	Hard to reclaim (rock fragments)	0.00
		Too acid	0.88			Rock fragments	0.95
		Droughty	0.97			Wetness	0.98
SbE:							
Snowbird, stony	80	Fair		Poor		Poor	
		Too acid	0.50	Slope	0.00	Slope	0.00
		Low content of organic matter	0.50	Low strength	0.00	Hard to reclaim (rock fragments)	0.60
				Depth to bedrock	0.77	Too acid	0.88
SbF:							
Snowbird, stony	80	Fair		Poor		Poor	
		Too acid	0.50	Slope	0.00	Slope	0.00
		Low content of organic matter	0.50	Low strength	0.00	Hard to reclaim (rock fragments)	0.60
				Depth to bedrock	0.77	Too acid	0.88
ScD:							
Soco, stony	50	Fair		Poor		Poor	
		Too acid	0.50	Depth to bedrock	0.00	Slope	0.00
		Low content of organic matter	0.50	Slope	0.08	Too acid	0.50
		Droughty	0.84			Rock fragments	0.87
		Depth to bedrock	0.90			Depth to bedrock	0.90
Stecoah, stony	40	Fair		Fair		Poor	
		Low content of organic matter	0.12	Slope	0.08	Slope	0.00
		Too acid	0.50	Depth to bedrock	0.16	Hard to reclaim (rock fragments)	0.08
		Water erosion	0.90			Rock fragments	0.24
						Too acid	0.50
ScE:							
Soco, stony	45	Fair		Poor		Poor	
		Too acid	0.50	Depth to bedrock	0.00	Slope	0.00
		Low content of organic matter	0.50	Slope	0.00	Too acid	0.50
		Droughty	0.84			Rock fragments	0.87
		Depth to bedrock	0.90			Depth to bedrock	0.90
Stecoah, stony	35	Fair		Poor		Poor	
		Low content of organic matter	0.12	Slope	0.00	Slope	0.00
		Too acid	0.50	Depth to bedrock	0.16	Hard to reclaim (rock fragments)	0.08
		Water erosion	0.90			Rock fragments	0.24
						Too acid	0.50

Table 14.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
ScF:							
Soco, stony	45	Fair		Poor		Poor	
		Too acid	0.50	Depth to bedrock	0.00	Slope	0.00
		Low content of organic matter	0.50	Slope	0.00	Too acid	0.50
		Droughty	0.84			Rock fragments	0.87
		Depth to bedrock	0.90			Depth to bedrock	0.90
Stecoah, stony	35	Fair		Poor		Poor	
		Low content of organic matter	0.12	Slope	0.00	Slope	0.00
		Too acid	0.50	Depth to bedrock	0.16	Hard to reclaim (rock fragments)	0.32
						Rock fragments	0.42
						Too acid	0.50
SdD:							
Soco, rocky	50	Fair		Poor		Poor	
		Too acid	0.50	Depth to bedrock	0.00	Slope	0.00
		Low content of organic matter	0.50	Slope	0.08	Too acid	0.50
		Droughty	0.84			Rock fragments	0.84
		Depth to bedrock	0.90			Depth to bedrock	0.90
Stecoah, rocky	35	Fair		Fair		Poor	
		Low content of organic matter	0.12	Slope	0.08	Slope	0.00
		Too acid	0.50	Depth to bedrock	0.16	Hard to reclaim (rock fragments)	0.32
						Rock fragments	0.42
						Too acid	0.50
SdE:							
Soco, rocky	45	Fair		Poor		Poor	
		Too acid	0.50	Depth to bedrock	0.00	Slope	0.00
		Low content of organic matter	0.50	Slope	0.00	Too acid	0.50
		Droughty	0.84			Rock fragments	0.84
		Depth to bedrock	0.90			Depth to bedrock	0.90
Stecoah, rocky	35	Fair		Poor		Poor	
		Low content of organic matter	0.12	Slope	0.00	Slope	0.00
		Too acid	0.50	Depth to bedrock	0.16	Hard to reclaim (rock fragments)	0.32
						Rock fragments	0.42
						Too acid	0.50
SdF:							
Soco, rocky	45	Fair		Poor		Poor	
		Too acid	0.50	Depth to bedrock	0.00	Slope	0.00
		Low content of organic matter	0.50	Slope	0.00	Too acid	0.50
		Droughty	0.84			Rock fragments	0.87
		Depth to bedrock	0.90			Depth to bedrock	0.90
Stecoah, rocky	35	Fair		Poor		Poor	
		Low content of organic matter	0.12	Slope	0.00	Slope	0.00
		Too acid	0.50	Depth to bedrock	0.16	Hard to reclaim (rock fragments)	0.08
		Water erosion	0.90			Rock fragments	0.24
						Too acid	0.50

Table 14.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
SnD:							
Soco, stony, windswept----------	50	Fair		Poor		Poor	
		Depth to bedrock	0.05	Depth to bedrock	0.00	Slope	0.00
		Droughty	0.09	Slope	0.08	Depth to bedrock	0.05
		Too acid	0.50			Too acid	0.50
		Low content of organic matter	0.88			Rock fragments	0.84
Stecoah, stony, windswept----------	40	Fair		Fair		Poor	
		Low content of organic matter	0.12	Slope	0.08	Slope	0.00
		Too acid	0.50	Depth to bedrock	0.16	Hard to reclaim (rock fragments)	0.08
				Cobble content	0.97	Rock fragments	0.24
						Too acid	0.50
SnE:							
Soco, stony, windswept----------	55	Fair		Poor		Poor	
		Depth to bedrock	0.05	Depth to bedrock	0.00	Slope	0.00
		Droughty	0.09	Slope	0.00	Depth to bedrock	0.05
		Too acid	0.50			Too acid	0.50
		Low content of organic matter	0.88			Rock fragments	0.84
Stecoah, stony, windswept----------	35	Fair		Poor		Poor	
		Low content of organic matter	0.12	Slope	0.00	Slope	0.00
		Too acid	0.50	Depth to bedrock	0.16	Hard to reclaim (rock fragments)	0.08
				Cobble content	0.97	Rock fragments	0.24
						Too acid	0.50
SpE:							
Spivey, very bouldery-----------	50	Poor		Poor		Poor	
		Stone content	0.00	Slope	0.00	Slope	0.00
		Too acid	0.50	Stones	0.00	Rock fragments	0.22
				Cobble content	0.95	Hard to reclaim (rock fragments)	0.50
						Too acid	0.76
Santeetlah, very bouldery-----------	40	Fair		Poor		Poor	
		Too acid	0.32	Slope	0.00	Slope	0.00
		Low content of organic matter	0.88			Hard to reclaim (rock fragments)	0.00
						Too acid	0.88
						Rock fragments	0.95
SpF:							
Spivey, very bouldery-----------	50	Poor		Poor		Poor	
		Stone content	0.00	Slope	0.00	Slope	0.00
		Too acid	0.50	Stones	0.00	Rock fragments	0.22
				Cobble content	0.95	Hard to reclaim (rock fragments)	0.50
						Too acid	0.76

Table 14.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
SpF:							
Santeetlah, very bouldery	40	Fair		Poor		Poor	
		Too acid	0.32	Slope	0.00	Slope	0.00
		Low content of organic matter	0.88			Hard to reclaim (rock fragments)	0.00
						Too acid	0.88
						Rock fragments	0.95
SvC:							
Spivey, bouldery	50	Poor		Poor		Fair	
		Stone content	0.00	Stones	0.00	Rock fragments	0.22
		Too acid	0.50	Cobble content	0.95	Slope	0.37
						Hard to reclaim (rock fragments)	0.50
						Too acid	0.76
Whiteoak, bouldery	40	Fair		Fair		Poor	
		Too acid	0.32	Low strength	0.22	Hard to reclaim (rock fragments)	0.00
		Low content of organic matter	0.88			Slope	0.37
						Too acid	0.88
SvD:							
Spivey, bouldery	50	Poor		Poor		Poor	
		Stone content	0.00	Stones	0.00	Slope	0.00
		Too acid	0.50	Slope	0.08	Rock fragments	0.22
				Cobble content	0.95	Hard to reclaim (rock fragments)	0.50
						Too acid	0.76
Whiteoak, bouldery	40	Fair		Fair		Poor	
		Too acid	0.32	Slope	0.08	Slope	0.00
		Low content of organic matter	0.88	Low strength	0.22	Hard to reclaim (rock fragments)	0.00
						Too acid	0.88
SwB:							
Statler, rarely flooded	90	Fair		Good		Fair	
		Low content of organic matter	0.50			Rock fragments	0.88
		Too acid	0.74				
SyD:							
Sylco, very rocky	60	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.03	Slope	0.08	Rock fragments	0.00
		Stone content	0.29	Cobble content	0.11	Depth to bedrock	0.03
		Too acid	0.50	Stones	0.29	Too acid	0.59
		Low content of organic matter	0.88				
Cataska, very rocky	30	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Cobble content	0.32	Depth to bedrock	0.00
		Stone content	0.40	Stones	0.40	Slope	0.00
		Too acid	0.50	Slope	0.08	Too acid	0.59
		Low content of organic matter	0.50				

Table 14.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
SyE:							
Sylco, very rocky---	45	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Slope	0.00
		Depth to bedrock	0.03	Slope	0.00	Rock fragments	0.00
		Stone content	0.29	Cobble content	0.11	Depth to bedrock	0.03
		Too acid	0.50	Stones	0.29	Too acid	0.59
		Low content of organic matter	0.88				
Cataska, very rocky-	35	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.00	Depth to bedrock	0.00
		Stone content	0.40	Cobble content	0.32	Slope	0.00
		Too acid	0.50	Stones	0.40	Too acid	0.59
		Low content of organic matter	0.50				
SyF:							
Sylco, very rocky---	50	Poor		Poor		Poor	
		Droughty	0.00	Slope	0.00	Slope	0.00
		Depth to bedrock	0.03	Depth to bedrock	0.00	Rock fragments	0.00
		Stone content	0.29	Cobble content	0.11	Depth to bedrock	0.03
		Too acid	0.50	Stones	0.29	Too acid	0.59
		Low content of organic matter	0.88				
Cataska, very rocky-	35	Poor		Poor		Poor	
		Droughty	0.00	Depth to bedrock	0.00	Rock fragments	0.00
		Depth to bedrock	0.00	Slope	0.00	Depth to bedrock	0.00
		Stone content	0.40	Cobble content	0.32	Slope	0.00
		Too acid	0.50	Stones	0.40	Too acid	0.59
		Low content of organic matter	0.50				
ThB:							
Thurmont------------	55	Fair		Good		Fair	
		Too acid	0.32			Too acid	0.88
		Low content of organic matter	0.88				
Dillard-------------	35	Fair		Poor		Fair	
		Too acid	0.32	Low strength	0.00	Too acid	0.88
		Low content of organic matter	0.88	Wetness	0.89	Wetness	0.89
UdD:							
Udorthents----------	50	Fair		Fair		Fair	
		Low content of organic matter	0.12	Cobble content	0.82	Hard to reclaim (rock fragments)	0.08
		Too acid	0.50			Rock fragments	0.08
						Too acid	0.50
						Slope	0.96
Urban land----------	40	Not rated		Not rated		Not rated	

Table 14.—Construction Materials, Part II—Continued

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material: Rating class and limiting features	Value	Potential source of roadfill: Rating class and limiting features	Value	Potential source of topsoil: Rating class and limiting features	Value
UdE:							
Udorthents	45	Fair		Poor		Poor	
		Low content of organic matter	0.12	Slope	0.00	Slope	0.00
		Too acid	0.50	Cobble content	0.82	Hard to reclaim (rock fragments)	0.08
						Rock fragments	0.08
						Too acid	0.50
Urban land	35	Not rated		Not rated		Not rated	
UnB:							
Unison	90	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Too acid	0.32	Shrink-swell	0.95	Too acid	0.88
		Low content of organic matter	0.50				
UnC:							
Unison	80	Poor		Poor		Poor	
		Too clayey	0.00	Low strength	0.00	Too clayey	0.00
		Too acid	0.32	Shrink-swell	0.95	Slope	0.37
		Low content of organic matter	0.50			Too acid	0.88
UoA:							
Udorthents, rarely flooded	60	Fair		Fair		Fair	
		Low content of organic matter	0.12	Cobble content	0.82	Hard to reclaim (rock fragments)	0.08
		Too acid	0.50			Rock fragments	0.08
						Too acid	0.50
Urban land, rarely flooded	30	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	

Table 15.—Ponds and Embankments

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
AkB:							
Alarka, occasionally flooded	65	Very limited		Very limited		Very limited	
		Seepage	1.00	Depth to saturated zone	1.00	Unstable excavation walls	1.00
		Slope	0.68	Seepage	0.75		
Wesser, occasionally flooded	25	Very limited		Very limited		Very limited	
		Seepage	1.00	Ponding	1.00	Unstable excavation walls	1.00
				Depth to saturated zone	1.00		
				Seepage	1.00		
BkB2:							
Braddock, moderately eroded	80	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
		Slope	0.32				
BkC2:							
Braddock, moderately eroded	80	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	1.00				
BkD2:							
Braddock, moderately eroded	85	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	1.00				
BnC:							
Braddock	50	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
		Slope	1.00				
Urban land	30	Not rated		Not rated		Not rated	
BuC:							
Breakneck, very rocky, windswept	45	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.91	Depth to water	1.00
		Slope	1.00				
		Depth to bedrock	0.91				
Pullback, very rocky, windswept	40	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00				
		Seepage	1.00				

Table 15.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
BuD:							
Breakneck, very rocky, windswept	65	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.91	Depth to water	1.00
		Slope	1.00				
		Depth to bedrock	0.91				
Pullback, very rocky, windswept	15	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00				
		Seepage	1.00				
BuE:							
Breakneck, very rocky, windswept	55	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.91	Depth to water	1.00
		Slope	1.00				
		Depth to bedrock	0.91				
Pullback, very rocky, windswept	30	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00				
		Seepage	1.00				
BuF:							
Breakneck, very rocky, windswept	55	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.91	Depth to water	1.00
		Slope	1.00				
		Depth to bedrock	0.91				
Pullback, very rocky, windswept	30	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00				
		Seepage	1.00				
ChE:							
Cheoah, stony	80	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.19	Depth to water	1.00
		Slope	1.00				
ChF:							
Cheoah, stony	80	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.19	Depth to water	1.00
		Slope	1.00				
CrD:							
Cheoah, rocky	65	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.01	Depth to water	1.00
		Slope	1.00				
Jeffrey, rocky	30	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Thin layer	0.81	Depth to water	1.00
		Seepage	1.00				
		Depth to bedrock	0.81				

Table 15.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
CrE:							
Cheoah, rocky	50	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.01	Depth to water	1.00
		Slope	1.00				
Jeffrey, rocky	40	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Thin layer	0.81	Depth to water	1.00
		Seepage	1.00				
		Depth to bedrock	0.81				
CsF:							
Cheoah, very rocky	50	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.01	Depth to water	1.00
		Slope	1.00				
Jeffrey, very rocky	40	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Thin layer	0.74	Depth to water	1.00
		Seepage	1.00				
		Depth to bedrock	0.74				
CwA:							
Cullowhee, occasionally flooded	50	Very limited		Very limited		Very limited	
		Seepage	1.00	Depth to saturated zone	1.00	Unstable excavation walls	1.00
				Seepage	1.00		
Ela, occasionally flooded	40	Very limited		Very limited		Very limited	
		Seepage	1.00	Ponding	1.00	Unstable excavation walls	1.00
				Depth to saturated zone	1.00		
				Seepage	1.00		
DAM:							
Dam	100	Not rated		Not rated		Not rated	
DeB:							
Dellwood, occasionally flooded	60	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Unstable excavation walls	1.00
				Depth to saturated zone	0.43	Depth to saturated zone	0.25
				Large stones	0.02	Large stones	0.02
Reddies, occasionally flooded	20	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Unstable excavation walls	1.00
				Depth to saturated zone	0.68	Depth to saturated zone	0.14

Table 15.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
DrB:							
Dillard, rarely flooded	80	Very limited		Somewhat limited		Somewhat limited	
		Seepage	1.00	Depth to saturated zone	0.86	Unstable excavation walls	0.10
				Piping	0.50	Depth to saturated zone	0.06
DtD:							
Ditney, very stony	40	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.86	Depth to water	1.00
		Slope	1.00				
		Depth to bedrock	0.86				
Unicoi, very stony	35	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Large stones	0.76		
		Seepage	1.00	Seepage	0.40		
Rock outcrop	20	Not rated		Not rated		Not rated	
DtE:							
Ditney, very stony	40	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.86	Depth to water	1.00
		Slope	1.00				
		Depth to bedrock	0.86				
Unicoi, very stony	35	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Large stones	0.25		
		Seepage	1.00				
Rock outcrop	20	Not rated		Not rated		Not rated	
DtF:							
Ditney, very stony	40	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.86	Depth to water	1.00
		Slope	1.00				
		Depth to bedrock	0.86				
Unicoi, very stony	35	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	1.00	Large stones	0.53		
		Seepage	1.00				
Rock outcrop	20	Not rated		Not rated		Not rated	
EtA:							
Ela, occasionally flooded	80	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Ponding	1.00	Unstable excavation walls	0.10
				Depth to saturated zone	1.00		
				Seepage	0.76		
Ela, undrained	10	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Ponding	1.00	Unstable excavation walls	0.10
				Depth to saturated zone	1.00		
				Seepage	0.73		

Table 15.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
FvA:							
Fluvaquents, ponded	90	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.03	Ponding	1.00	Slow refill	0.97
				Depth to saturated zone	1.00	Unstable excavation walls	0.10
HcD:							
Heintooga, bouldery	55	Very limited		Very limited		Very limited	
		Seepage	1.00	Large stones	1.00	Depth to water	1.00
		Slope	1.00	Seepage	1.00		
Chiltoskie, bouldery	35	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
		Slope	1.00				
HdE:							
Heintooga, very bouldery	55	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Depth to water	1.00
		Slope	1.00	Large stones	1.00		
Chiltoskie, very bouldery	35	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
		Slope	1.00				
HmA:							
Hemphill, rarely flooded	75	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.03	Ponding	1.00	Slow refill	0.30
				Depth to saturated zone	1.00	Unstable excavation walls	0.10
				Piping	0.11		
Hemphill, undrained	5	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.03	Ponding	1.00	Slow refill	0.30
				Depth to saturated zone	1.00	Unstable excavation walls	0.10
				Piping	0.11		
JbC:							
Junaluska	50	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.66	Depth to water	1.00
		Slope	1.00				
		Depth to bedrock	0.03				
Brasstown	40	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.55	Depth to water	1.00
		Seepage	0.70	Thin layer	0.26		
JbD:							
Junaluska	50	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.95	Depth to water	1.00
		Slope	1.00				
		Depth to bedrock	0.23				
Brasstown	40	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.55	Depth to water	1.00
		Seepage	0.70	Thin layer	0.26		

Table 15.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
JbE:							
Junaluska-----------	50	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.95	Depth to water	1.00
		Slope	1.00				
		Depth to bedrock	0.23				
Brasstown-----------	40	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.55	Depth to water	1.00
		Seepage	0.70	Thin layer	0.26		
JnD:							
Junaluska-----------	40	Not rated		Not rated		Not rated	
Brasstown-----------	30	Not rated		Not rated		Not rated	
Urban land----------	25	Not rated		Not rated		Not rated	
JtD:							
Junaluska-----------	65	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.66	Depth to water	1.00
		Slope	1.00				
		Depth to bedrock	0.03				
Tsali---------------	25	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	0.53	Piping	0.51		
		Seepage	0.03				
JtE:							
Junaluska-----------	65	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.66	Depth to water	1.00
		Slope	1.00				
		Depth to bedrock	0.03				
Tsali---------------	25	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	0.53	Piping	0.51		
		Seepage	0.03				
JtF:							
Junaluska-----------	65	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.66	Depth to water	1.00
		Slope	1.00				
		Depth to bedrock	0.03				
Tsali---------------	25	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Depth to bedrock	0.53	Piping	0.51		
		Seepage	0.03				
LnC:							
Lonon, bouldery-----	65	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.07	Depth to water	1.00
		Seepage	0.70				
Northcove, bouldery-	20	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Large stones	0.84	Depth to water	1.00
		Slope	1.00	Seepage	0.78		

Table 15.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
LnD:							
Lonon, bouldery-----	65	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.07	Depth to water	1.00
		Seepage	0.70				
Northcove, bouldery-	20	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Large stones	0.84	Depth to water	1.00
		Slope	1.00	Seepage	0.78		
LtD:							
Luftee, very rocky, windswept----------	55	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.78	Depth to water	1.00
		Slope	1.00	Thin layer	0.74		
		Depth to bedrock	0.74	Large stones	0.57		
Anakeesta, very rocky, windswept---	30	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.91	Depth to water	1.00
		Slope	1.00	Large stones	0.49		
		Depth to bedrock	0.26	Thin layer	0.26		
LtE:							
Luftee, very rocky, windswept----------	55	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.78	Depth to water	1.00
		Slope	1.00	Thin layer	0.74		
		Depth to bedrock	0.74	Large stones	0.57		
Anakeesta, very rocky, windswept---	30	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.91	Depth to water	1.00
		Slope	1.00	Large stones	0.49		
		Depth to bedrock	0.26	Thin layer	0.26		
LtF:							
Luftee, very rocky, windswept----------	55	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.78	Depth to water	1.00
		Slope	1.00	Thin layer	0.74		
		Depth to bedrock	0.74	Large stones	0.57		
Anakeesta, very rocky, windswept---	30	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.91	Depth to water	1.00
		Slope	1.00	Large stones	0.49		
		Depth to bedrock	0.26	Thin layer	0.26		
NtE:							
Northcove, very bouldery-----------	55	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Large stones	0.98	Depth to water	1.00
		Slope	1.00	Seepage	0.14		
Lonon, very bouldery	40	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.07	Depth to water	1.00
		Seepage	0.70				

Table 15.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
RdA:							
Reddies, occasionally flooded	80	Very limited		Very limited		Very limited	
		Seepage	1.00	Seepage	1.00	Unstable excavation walls	1.00
				Depth to saturated zone	0.68	Depth to saturated zone	0.14
SbE:							
Snowbird, stony	80	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Piping	0.84	Depth to water	1.00
		Slope	1.00	Thin layer	0.06		
SbF:							
Snowbird, stony	80	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Piping	0.84	Depth to water	1.00
		Slope	1.00	Thin layer	0.06		
ScD:							
Soco, stony	50	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.70	Depth to water	1.00
		Slope	1.00				
		Depth to bedrock	0.04				
Stecoah, stony	40	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Depth to water	1.00
		Slope	1.00	Thin layer	0.26		
ScE:							
Soco, stony	45	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.70	Depth to water	1.00
		Slope	1.00				
		Depth to bedrock	0.04				
Stecoah, stony	35	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Depth to water	1.00
		Slope	1.00	Thin layer	0.26		
ScF:							
Soco, stony	45	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.70	Depth to water	1.00
		Slope	1.00				
		Depth to bedrock	0.04				
Stecoah, stony	35	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Depth to water	1.00
		Slope	1.00	Thin layer	0.26		
SdD:							
Soco, rocky	50	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.70	Depth to water	1.00
		Slope	1.00				
		Depth to bedrock	0.04				
Stecoah, rocky	35	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Depth to water	1.00
		Slope	1.00	Thin layer	0.26		

Table 15.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
SdE:							
Soco, rocky	45	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.70	Depth to water	1.00
		Slope	1.00				
		Depth to bedrock	0.04				
Stecoah, rocky	35	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Depth to water	1.00
		Slope	1.00	Thin layer	0.26		
SdF:							
Soco, rocky	45	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.70	Depth to water	1.00
		Slope	1.00				
		Depth to bedrock	0.04				
Stecoah, rocky	35	Very limited		Very limited		Very limited	
		Seepage	1.00	Piping	1.00	Depth to water	1.00
		Slope	1.00	Thin layer	0.26		
SnD:							
Soco, stony, windswept	50	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.99	Depth to water	1.00
		Slope	1.00				
		Depth to bedrock	0.34				
Stecoah, stony, windswept	40	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.26	Depth to water	1.00
		Slope	1.00				
SnE:							
Soco, stony, windswept	55	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.99	Depth to water	1.00
		Slope	1.00				
		Depth to bedrock	0.34				
Stecoah, stony, windswept	35	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.26	Depth to water	1.00
		Slope	1.00				
SpE:							
Spivey, very bouldery	50	Very limited		Very limited		Very limited	
		Slope	1.00	Large stones	1.00	Depth to water	1.00
		Seepage	1.00	Piping	1.00		
Santeetlah, very bouldery	40	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.85	Depth to water	1.00
		Seepage	0.70				
SpF:							
Spivey, very bouldery	50	Very limited		Very limited		Very limited	
		Slope	1.00	Large stones	1.00	Depth to water	1.00
		Seepage	1.00	Piping	1.00		

Table 15.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
SpF:							
Santeetlah, very bouldery	40	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.85	Depth to water	1.00
		Seepage	0.70				
SvC:							
Spivey, bouldery	50	Very limited		Very limited		Very limited	
		Slope	1.00	Large stones	1.00	Depth to water	1.00
		Seepage	1.00	Piping	1.00		
Whiteoak, bouldery	40	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.76	Depth to water	1.00
		Seepage	0.70				
SvD:							
Spivey, bouldery	50	Very limited		Very limited		Very limited	
		Slope	1.00	Large stones	1.00	Depth to water	1.00
		Seepage	1.00	Piping	1.00		
Whiteoak, bouldery	40	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.76	Depth to water	1.00
		Seepage	0.70				
SwB:							
Statler, rarely flooded	90	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Piping	0.48	Depth to water	1.00
		Slope	0.32				
SyD:							
Sylco, very rocky	60	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.99	Depth to water	1.00
		Slope	1.00	Large stones	0.77		
		Depth to bedrock	0.99				
Cataska, very rocky	30	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Seepage	1.00	Large stones	0.50		
		Depth to bedrock	0.91				
SyE:							
Sylco, very rocky	45	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.99	Depth to water	1.00
		Slope	1.00	Large stones	0.77		
		Depth to bedrock	0.99				
Cataska, very rocky	35	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Seepage	1.00	Large stones	0.50		
		Depth to bedrock	0.91				
SyF:							
Sylco, very rocky	50	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Thin layer	0.99	Depth to water	1.00
		Slope	1.00	Large stones	0.77		
		Depth to bedrock	0.99				
Cataska, very rocky	35	Very limited		Very limited		Very limited	
		Slope	1.00	Thin layer	1.00	Depth to water	1.00
		Seepage	1.00	Large stones	0.50		
		Depth to bedrock	0.91				

Table 15.—Ponds and Embankments—Continued

Map unit symbol and soil name	Pct. of map unit	Pond reservoir areas: Rating class and limiting features	Value	Embankments, dikes, and levees: Rating class and limiting features	Value	Aquifer-fed excavated ponds: Rating class and limiting features	Value
ThB:							
Thurmont------------	55	Very limited		Not limited		Somewhat limited	
		Seepage	1.00			Depth to saturated zone	0.96
		Slope	0.32			Slow refill	0.30
						Unstable excavation walls	0.10
Dillard-------------	35	Very limited		Somewhat limited		Somewhat limited	
		Seepage	1.00	Depth to saturated zone	0.86	Unstable excavation walls	0.10
		Slope	0.08	Piping	0.70	Depth to saturated zone	0.06
UdD:							
Udorthents----------	50	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
		Slope	1.00				
Urban land----------	40	Not rated		Not rated		Not rated	
UdE:							
Udorthents----------	45	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
		Slope	1.00				
Urban land----------	35	Not rated		Not rated		Not rated	
UnB:							
Unison--------------	90	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
		Slope	0.32				
UnC:							
Unison--------------	80	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
		Slope	1.00				
UoA:							
Udorthents, rarely flooded------------	60	Very limited		Not limited		Very limited	
		Seepage	1.00			Depth to water	1.00
Urban land, rarely flooded------------	30	Not rated		Not rated		Not rated	
W:							
Water---------------	100	Not rated		Not rated		Not rated	

Table 16.—Engineering Index Properties

(An asterisk indicates the representative value used to generate the interpretations. Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
AkB:												
Alarka, occasionally flooded--------	0-3	*Moderately decomposed plant material	*PT	*A-8	0	0-8	---	---	---	---	---	---
	3-10	*Highly decomposed plant material	*PT	*A-8	0	0-8	---	---	---	---	---	---
	10-13	*Loam	*CL, CH	*A-6, A-7-6	0	0-8	91-100	91-100	76-99	56-77	28-51	12-24
	13-21	*Loam	*CL	*A-6, A-7-6	0	0-8	91-100	91-100	76-100	56-78	27-46	12-24
	21-36	*Very fine sandy loam	*CL	*A-4, A-6	0	0-8	91-100	91-100	82-100	44-64	16-33	2-13
	36-80	*Very gravelly loamy sand, extremely gravelly sandy loam, very cobbly sandy loam	*GP-GC	*A-1-a, A-2-4, A-1-b	13-21	0-21	18-62	15-60	11-51	4-21	16-28	2-10
Wesser, occasionally flooded--------	0-3	*Highly decomposed plant material	*PT	*A-8	0	0-8	---	---	---	---	---	---
	3-6	*Sandy loam, very fine sandy loam	*ML, OH	*A-7-5	0	0	100	100	83-100	46-64	29-65	2-15
	6-13	*Loamy fine sand	*SM, SC-SM	*A-4	0	0	100	100	92-100	33-45	0-44	NP-9
	13-19	*Sand	*SM	*A-2-4	0	0-7	85-100	85-100	66-86	12-23	0-33	NP-6
	19-80	*Extremely gravelly sand, very cobbly sandy loam, very gravelly loamy sand, extremely gravelly sandy loam	*GP	*A-1-a	0-7	6-20	13-59	10-57	7-49	1-13	0-29	NP-6
BkB2:												
Braddock, moderately eroded---------	0-11	*Clay loam	*CL, SC	*A-7-6, A-6	0	0-5	82-98	65-96	55-94	42-75	35-52	18-28
	11-57	*Clay, gravelly clay, sandy clay, clay loam	*CH, SC, GC, CL	*A-7-6	0	0-10	86-98	65-96	55-96	44-85	43-64	25-40
	57-80	*Loam, sandy clay loam, gravelly sandy clay loam	*CL, SC	*A-6, A-7-6	0-1	0-10	86-98	65-96	54-96	40-75	27-45	12-25

Table 16.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
BkC2: Braddock, moderately eroded---------	0-11	*Clay loam	*CL, SC	*A-7-6, A-6	0	0-5	82-100	65-100	55-98	42-78	35-52	18-28
	11-57	*Clay, gravelly clay, sandy clay, clay loam	*CH, GC, CL, SC	*A-7-6	0	0-10	86-98	65-96	55-96	44-85	43-64	25-40
	57-80	*Loam, sandy clay loam, gravelly sandy clay loam	*CL, SC	*A-6, A-7-6	0-1	0-10	86-98	65-96	54-96	40-75	27-45	12-25
BkD2: Braddock, moderately eroded---------	0-11	*Clay loam	*CL, SC	*A-7-6, A-6	0	0-5	82-98	65-96	55-94	42-75	35-52	18-28
	11-57	*Clay, gravelly clay, sandy clay, clay loam	*CH, GC, CL, SC	*A-7-6	0	0-10	86-98	65-96	55-96	44-85	43-64	25-40
	57-80	*Loam, sandy clay loam, gravelly sandy clay loam	*CL, SC	*A-6, A-7-6	0-1	0-10	86-98	65-96	54-96	40-75	27-45	12-25
BnC: Braddock--------	0-11	*Clay loam	*CL	*A-7-6, A-6	0	0-5	83-98	68-96	57-94	44-75	36-50	18-28
	11-57	*Clay, gravelly clay, sandy clay, clay loam	*CH, GC, CL, SC	*A-7-6	0	0-10	86-98	65-96	55-96	44-85	43-64	25-40
	57-80	*Loam, sandy clay loam, gravelly sandy clay loam	*CL, SC	*A-6, A-7-6	0-1	0-10	86-98	65-96	54-96	40-75	27-45	12-25
Urban land.												
BuC: Breakneck, very rocky, windswept------	0-12	*Channery loam, loam	*GM	*A-7-5	0-4	1-33	58-98	57-98	47-97	34-74	44-79	7-17
	12-28	*Channery loam, loam, sandy loam, channery sandy loam	*SM, CL-ML	*A-7-6, A-6	0-3	0-27	69-100	68-100	53-94	37-70	27-52	6-17
	28-80	*Unweathered bedrock			---	---	---	---	---	---	---	---
Pullback, very rocky, windswept------	0-8	*Loam, sandy loam, channery loam	*OH	*A-7-5	0-4	0-33	58-100	57-100	47-98	34-75	44-79	7-17
	8-16	*Channery loam, loam, sandy loam, channery sandy loam	*ML, CL-ML	*A-7-6, A-6	0-3	0-27	69-100	68-100	51-94	35-70	24-52	3-17
	16-80	*Unweathered bedrock			---	---	---	---	---	---	---	---

Table 16.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
BuD:												
Breakneck, very rocky, windswept------	0-12	*Channery loam, loam	*GM	*A-7-5	0-4	1-33	58-98	57-98	47-97	34-74	44-79	7-17
	12-28	*Channery loam, loam, sandy loam, channery sandy loam	*SM, CL-ML	*A-7-6, A-6	0-3	0-27	69-100	68-100	53-94	37-70	27-52	6-17
	28-80	*Unweathered bedrock			---	---	---	---	---	---	---	---
Pullback, very rocky, windswept------	0-8	*Loam, sandy loam, channery loam	*OH	*A-7-5	0-4	0-33	58-100	57-100	47-98	34-75	44-79	7-17
	8-16	*Channery loam, loam, sandy loam, channery sandy loam	*ML, CL-ML	*A-7-6, A-6	0-3	0-27	69-100	68-100	51-94	35-70	24-52	3-17
	16-80	*Unweathered bedrock			---	---	---	---	---	---	---	---
BuE:												
Breakneck, very rocky, windswept------	0-12	*Channery loam, loam	*GM	*A-7-5	0-4	1-33	58-98	57-98	47-95	33-71	44-79	7-17
	12-28	*Channery loam, loam, sandy loam, channery sandy loam	*SM, CL-ML	*A-7-6, A-6	0-3	0-27	69-100	68-100	53-93	37-69	27-51	6-16
	28-80	*Unweathered bedrock			---	---	---	---	---	---	---	---
Pullback, very rocky, windswept------	0-8	*Loam, sandy loam, channery loam	*OH	*A-7-5	0-4	0-33	58-100	57-100	47-98	34-75	44-79	7-17
	8-16	*Channery loam, loam, sandy loam, channery sandy loam	*ML	*A-7-6, A-6	0-3	0-27	69-100	68-100	51-93	35-69	24-51	3-16
	16-80	*Unweathered bedrock			---	---	---	---	---	---	---	---
BuF:												
Breakneck, very rocky, windswept------	0-12	*Channery loam, loam	*GM	*A-7-5	0-4	1-33	58-98	57-98	47-97	34-74	44-79	7-17
	12-28	*Channery loam, loam, sandy loam, channery sandy loam	*SM, CL-ML	*A-7-6, A-6	0-3	0-27	69-100	68-100	53-92	37-68	27-50	6-15
	28-80	*Unweathered bedrock			---	---	---	---	---	---	---	---

Table 16.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
BuF:												
Pullback, very rocky, windswept------	0-8	*Loam, sandy loam, channery loam	*OH	*A-7-5	0-4	0-33	58-100	57-100	47-98	34-75	44-79	7-17
	8-16	*Channery loam, loam, sandy loam, channery sandy loam	*CL-ML	*A-7-6, A-6	0-3	0-27	69-100	68-100	51-93	35-69	24-51	3-16
	16-80	*Unweathered bedrock			---	---	---	---	---	---	---	---
ChE:												
Cheoah, stony---	0-17	*Channery loam, loam	*OL, ML, MH, GM	*A-5, A-7-5, A-4	1-13	2-22	80-99	80-99	65-93	44-68	29-61	2-11
	17-36	*Channery loam, silt loam, fine sandy loam, loam	*SC, SM, ML	*A-6	0-11	1-25	78-98	77-98	61-92	35-59	16-33	2-13
	36-47	*Channery fine sandy loam, channery silt loam, channery loam	*SC-SM, GM, SM	*A-2-4	0-6	1-25	73-98	73-98	61-96	26-48	16-30	2-12
	47-80	*Weathered bedrock			---	---	---	---	---	---	---	---
ChF:												
Cheoah, stony---	0-17	*Channery loam, loam	*OL, ML, MH, GM	*A-5, A-7-5, A-4	1-13	2-22	80-99	80-99	65-93	44-68	29-61	2-11
	17-36	*Fine sandy loam, loam, silt loam	*SC-SM, SM	*A-4	0-11	1-24	77-98	76-98	64-96	28-48	16-31	2-12
	36-47	*Channery fine sandy loam, channery loam, channery silt loam	*SC-SM, GM, SM	*A-2-4	0-6	1-25	73-98	73-98	61-96	26-48	16-30	2-12
	47-80	*Weathered bedrock			---	---	---	---	---	---	---	---
CrD:												
Cheoah, rocky---	0-12	*Flaggy fine sandy loam, loam, channery loam	*SM	*A-4, A-5, A-7-5	1-13	2-22	80-99	80-99	68-97	29-49	29-61	2-11
	12-47	*Fine sandy loam, loam, silt loam	*SC-SM, SM, SC	*A-2-4	0-11	1-25	78-98	77-98	66-97	24-44	17-35	2-12
	47-56	*Channery fine sandy loam, channery loam, channery silt loam	*SC-SM, SM, SC	*A-2-4	0-6	1-25	73-98	73-98	62-96	27-49	16-30	2-12
	56-80	*Weathered bedrock			---	---	---	---	---	---	---	---

Table 16.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
CrD:												
Jeffrey, rocky--	0-8	*Channery fine sandy loam, flaggy fine sandy loam	*SM	*A-2-4	0-10	12-28	73-87	73-87	65-84	26-38	33-61	5-11
	8-32	*Channery loam, flaggy loam, flaggy sandy loam, very flaggy loam	*CL-ML, ML, GM	*A-4	0-19	12-34	73-87	73-87	61-86	42-64	21-38	4-16
	32-80	*Unweathered bedrock			---	---	---	---	---	---	---	---
CrE:												
Cheoah, rocky---	0-12	*Channery sandy loam, loam, channery loam, flaggy fine sandy loam	*SM	*A-4, A-5, A-7-5	1-13	2-22	80-99	80-99	68-97	29-49	29-61	2-11
	12-47	*Fine sandy loam, loam, silt loam	*SC-SM, SC-SM	*A-2-4	0-11	1-25	78-98	77-98	68-98	27-49	20-39	4-15
	47-56	*Channery fine sandy loam, channery loam, channery silt loam	*SC-SM, SM, SC	*A-2-4	0-6	1-25	73-98	73-98	61-96	26-48	16-30	2-12
	56-80	*Weathered bedrock			---	---	---	---	---	---	---	---
Jeffrey, rocky--	0-8	*Channery fine sandy loam, flaggy fine sandy loam	*SM	*A-2-4	0-10	12-28	73-87	73-87	65-84	26-38	33-61	5-11
	8-32	*Channery loam, flaggy sandy loam, flaggy loam, very flaggy loam	*CL-ML, ML, GM	*A-4	0-19	12-34	73-87	73-87	61-86	42-64	21-38	4-16
	32-80	*Unweathered bedrock			---	---	---	---	---	---	---	---
CsF:												
Cheoah, very rocky----------	0-12	*Channery sandy loam, loam, channery loam, flaggy fine sandy loam	*SM	*A-4, A-5, A-7-5	1-13	2-22	80-99	80-99	60-87	29-49	29-61	2-11
	12-47	*Channery loam, silt loam, fine sandy loam, loam	*SC, SM	*A-6	0-11	1-25	78-98	77-98	61-90	35-57	17-35	2-12
	47-56	*Channery fine sandy loam, channery silt loam, channery loam	*SC-SM, SM, SC, CL	*A-2-4	0-6	1-25	73-98	73-98	61-98	26-50	16-32	2-13
	56-80	*Weathered bedrock			---	---	---	---	---	---	---	---

Table 16.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
CsF:												
Jeffrey, very rocky----------	0-8	*Channery loam, channery fine sandy loam	*SM, ML	*A-4	0-10	12-28	73-87	73-87	60-78	40-54	33-61	5-11
	8-27	*Channery loam, flaggy loam, channery sandy loam	*SC-SM	*A-4	0-10	12-28	73-87	73-87	61-79	43-57	21-31	4-10
	27-34	*Channery sandy loam, flaggy sandy loam, channery fine sandy loam	*SC	*A-2-4	0-18	11-35	70-87	69-87	49-71	21-37	18-32	4-13
	34-80	*Unweathered bedrock			---	---	---	---	---	---	---	---
CwA:												
Cullowhee, occasionally flooded--------	0-13	*Fine sandy loam	*SM	*A-5, A-2-4	0	0-5	90-98	73-96	62-94	26-47	29-61	2-11
	13-23	*Loamy sand, gravelly loamy sand, sand	*SM	*A-2-4, A-1-b	0	0-11	77-98	49-96	38-79	13-32	0-25	NP-4
	23-35	*Loamy sand, sandy loam, loamy fine sand	*SC-SM	*A-2-4	0	0-4	90-98	77-96	59-81	16-27	16-26	2-7
	35-80	*Extremely gravelly sand, very cobbly sand, very gravelly sand	*SW, SP-SM	*A-1-a	1-10	19-29	47-82	7-65	6-51	0-7	0-19	NP-2
Ela, occasionally flooded--------	0-15	*Silt loam, sandy loam, loam, fine sandy loam	*OL, ML	*A-5	0	0-5	90-98	73-96	62-95	49-77	34-61	2-11
	15-28	*Gravelly fine sandy loam, gravelly coarse sandy loam, gravelly loam, gravelly sandy loam	*SM	*A-2-5, A-4, A-2-4	0	0-14	83-92	53-75	45-73	20-38	27-55	2-11
	28-80	*Extremely cobbly sandy loam, very cobbly loamy sand, very gravelly sand, extremely gravelly coarse sand	*GW-GC, GP-GM	*A-1-a	1-15	8-36	37-72	9-57	6-47	3-25	16-27	2-10
DAM.												
Dam												

Table 16.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
DeB:												
Dellwood, occasionally flooded--------	0-8	*Gravelly fine sandy loam	*SM	*A-2-4, A-4, A-1-b	0-1	1-11	74-88	53-76	46-73	20-36	29-48	2-9
	8-16	*Extremely gravelly sand, very gravelly sand, very gravelly loamy sand	*SW, SP, GP-GM	*A-1-a	0-3	13-14	47-79	7-60	6-48	0-8	0-34	NP-4
	16-80	*Extremely gravelly coarse sand, extremely gravelly sand, very cobbly sand	*SW, SP, GP-GM	*A-1-a	6-31	13-29	49-82	9-65	4-31	1-9	0-19	NP-1
Reddies, occasionally flooded--------	0-14	*Sandy loam, gravelly fine sandy loam, loam, fine sandy loam	*SM, ML	*A-4	0	0-4	84-98	60-96	48-90	29-58	29-50	2-11
	14-26	*Fine sandy loam, sandy loam, gravelly sandy loam	*SC-SM	*A-2-4, A-4, A-1-b	0-1	0-11	78-98	47-96	40-94	17-48	17-31	2-12
	26-80	*Very gravelly sand, extremely gravelly sand, very cobbly sand	*SP, SP-SM, GP	*A-1-b, A-1-a	2-21	7-29	47-91	7-86	6-68	0-9	0-19	NP-2
DrB:												
Dillard, rarely flooded--------	0-7	*Loam, sandy clay loam	*ML, CL	*A-6	0	0-3	95-98	84-96	67-92	47-69	25-52	6-17
	7-50	*Clay loam, loam, sandy clay loam	*CL	*A-6, A-7-6	0	0-3	95-98	82-97	65-93	49-74	27-45	12-25
	50-80	*Sandy loam, loam, sandy clay loam	*SC-SM	*A-2-4	0	0-3	93-98	80-96	55-87	25-50	16-38	2-18
DtD:												
Ditney, very stony----------	0-7	*Channery sandy loam, loam, flaggy sandy loam	*SM, SC-SM	*A-2-4, A-4	0-12	1-23	77-99	77-99	55-84	26-47	18-46	2-12
	7-25	*Sandy loam, loam, fine sandy loam	*SC-SM, SM	*A-4, A-2-4	0-9	1-12	91-98	91-98	65-83	31-47	16-31	2-12
	25-30	*Flaggy sandy loam, flaggy loam, sandy loam, loam	*SC-SM, SM	*A-4, A-2-4	0-21	3-26	79-98	78-97	56-83	27-46	16-31	2-12
	30-80	*Unweathered bedrock			---	---	---	---	---	---	---	---

Table 16.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
DtD:												
Unicoi, very stony----------	0-5	*Flaggy loam, flaggy sandy loam	*ML, SC-SM	*A-4	0-16	4-23	80-96	80-96	64-91	43-66	20-43	2-13
	5-16	*Very flaggy sandy loam, very flaggy loam, very stony loam	*SC, SC-SM, GM, GC-GM	*A-2-4, A-1-b	11-29	22-31	62-80	62-79	42-66	19-36	16-33	2-13
	16-80	*Unweathered bedrock			---	---	---	---	---	---	---	---
Rock outcrop.												
DtE:												
Ditney, very stony----------	0-6	*Channery sandy loam, loam, flaggy sandy loam	*SM, SC-SM	*A-2-4, A-4	0-12	1-23	77-99	77-99	55-84	26-47	18-46	2-12
	6-30	*Channery sandy loam, flaggy fine sandy loam, sandy loam	*SC-SM, SM, ML, CL-ML	*A-4, A-2-4	0-23	1-32	77-99	76-99	65-97	29-50	16-31	2-12
	30-80	*Unweathered bedrock			---	---	---	---	---	---	---	---
Unicoi, very stony----------	0-4	*Channery fine sandy loam, sandy loam	*SM, SC-SM	*A-4	0-16	4-23	80-96	80-96	65-92	37-58	20-43	2-13
	4-15	*Very flaggy fine sandy loam, very channery fine sandy loam	*SC, SC-SM, GM, GC-GM	*A-2-4	11-26	22-34	62-80	62-79	53-79	21-39	16-33	2-13
	16-80	*Unweathered bedrock			---	---	---	---	---	---	---	---
Rock outcrop.												
DtF:												
Ditney, very stony----------	0-6	*Channery sandy loam, loam, flaggy sandy loam	*SM, SC-SM	*A-2-4, A-4	0-12	1-23	77-99	77-99	55-84	26-47	18-46	2-12
	6-30	*Channery sandy loam, flaggy fine sandy loam, sandy loam	*SC-SM, SM, ML, CL-ML	*A-4, A-2-4	0-23	1-32	77-99	76-99	65-97	29-50	16-31	2-12
	30-80	*Unweathered bedrock			---	---	---	---	---	---	---	---
Unicoi, very stony----------	0-5	*Channery fine sandy loam, sandy loam	*SM, SC-SM	*A-4	2-15	7-29	73-95	73-95	59-91	34-58	20-43	2-13
	5-16	*Very flaggy fine sandy loam, very channery fine sandy loam	*SC, SC-SM, GM, GC-GM	*A-2-4	11-26	22-34	62-80	62-79	53-79	21-39	16-33	2-13
	16-80	*Unweathered bedrock			---	---	---	---	---	---	---	---
Rock outcrop.												

Table 16.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
EtA:												
Ela, occasionally flooded--------	0-16	*Silt loam, fine sandy loam, sandy loam, loam, coarse sandy loam	*OL, ML	*A-5	0	0-16	90-98	73-96	62-94	49-77	34-61	2-11
	16-32	*Fine sandy loam, gravelly fine sandy loam, gravelly loam, gravelly sandy loam, gravelly coarse sandy loam	*SM	*A-5, A-4, A-2-4	0	0-14	84-98	54-96	46-94	21-49	27-55	2-11
	32-80	*Extremely cobbly sandy loam, very gravelly sand, extremely gravelly coarse sand, very cobbly loamy sand	*SP-SC, SP-SM, SM, GP-GM	*A-1-a, A-2-4	4-16	9-38	39-76	14-59	10-49	5-26	16-27	2-10
Ela, undrained--	0-16	*Silt loam, fine sandy loam, sandy loam, loam, coarse sandy loam	*OL, ML	*A-5	0	0-16	90-98	73-96	62-94	49-77	34-61	2-11
	16-32	*Fine sandy loam, gravelly fine sandy loam, gravelly loam, gravelly sandy loam, gravelly coarse sandy loam	*SM	*A-5, A-4, A-2-4	0	0-14	84-98	54-96	46-94	21-49	27-55	2-11
	32-80	*Extremely cobbly sandy loam, very gravelly sand, extremely gravelly coarse sand, very cobbly loamy sand	*SP-SC, SP-SM, SM, GP-GM	*A-1-a, A-2-4	4-16	9-38	39-76	14-59	10-49	5-26	16-27	2-10
FvA:												
Fluvaquents, ponded---------	0-80	*Sandy clay loam, loam, clay loam	*SC, CL-ML, SC-SM	*A-6, A-5, A-4	0-5	0-3	94-98	83-96	58-93	27-57	18-44	4-25
HcD:												
Heintooga, bouldery-------	0-12	*Very flaggy loam	*GM	*A-7-5	15-45	31-40	45-66	44-65	36-63	25-47	44-79	7-17
	12-25	*Extremely channery fine sandy loam, extremely channery loam	*GM, GM	*A-1-a, A-2-4	6-27	37-46	15-44	13-43	12-43	6-24	16-28	2-10
	25-80	*Extremely flaggy coarse sandy loam, extremely flaggy sandy loam	*GM, SM	*A-1-a, A-2-4	24-53	37-44	21-64	19-64	12-47	7-31	16-28	2-10

Table 16.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
Chiltoskie, bouldery-------	0-8	*Loam, channery sandy loam, sandy loam	*OH, SC-SM, OL	*A-7-5	0-13	1-26	77-99	76-99	61-94	43-71	44-79	7-17
	8-43	*Loam, channery sandy loam, sandy loam	*CL	*A-4, A-6	0-12	0-24	80-99	79-99	66-98	46-73	20-37	6-17
	43-80	*Very channery sandy loam, channery sandy loam, sandy loam, loam	*SC-SM, SM	*A-2-4, A-1-b	3-62	7-52	50-95	49-95	36-79	17-43	16-28	2-10
HdE:												
Heintooga, very bouldery-------	0-12	*Very flaggy loam	*GM	*A-7-5	15-45	31-40	45-66	44-65	35-63	25-47	42-79	5-17
	12-25	*Extremely channery fine sandy loam, extremely channery loam	*GM, GC-GM	*A-1-a, A-2-4	6-27	37-46	15-44	13-43	12-43	6-24	16-28	2-10
	25-80	*Extremely flaggy coarse sandy loam, very flaggy sandy loam, extremely flaggy sandy loam	*GM, SM	*A-1-a, A-2-4	19-53	29-44	21-73	19-72	12-54	7-36	16-28	2-10
Chiltoskie, very bouldery--	0-8	*Loam, channery sandy loam, sandy loam	*OH, SC-SM, OL	*A-7-5	0-13	1-26	77-99	76-99	61-94	43-71	44-79	7-17
	8-43	*Loam, channery sandy loam, sandy loam	*CL	*A-4, A-6	0-12	0-24	80-99	79-99	66-97	46-72	20-36	6-16
	43-80	*Very channery sandy loam, channery sandy loam, sandy loam, loam	*SC-SM, SM	*A-1-b, A-2-4	0-16	8-45	43-92	42-91	31-76	15-41	16-28	2-10
HmA:												
Hemphill, rarely flooded-	0-8	*Loam, clay loam	*OL, SM	*A-7-5	0	0	94-100	87-100	68-100	47-76	36-70	4-20
	8-32	*Clay loam, silty clay, clay	*CL, CH	*A-7-6	0	0	94-100	89-100	79-100	63-96	42-67	24-43
	32-80	*Sandy clay loam, loam, clay loam	*SC, CL-ML, SC-SM	*A-6, A-7-6, A-5, A-4	0	0	95-100	84-100	61-100	28-61	18-45	4-25
Hemphill, undrained------	0-8	*Loam, clay loam	*OL, SM	*A-7-5	0	0	94-100	87-100	68-100	47-76	36-70	4-20
	8-32	*Clay loam, silty clay, clay	*CL, CH	*A-7-6	0	0	94-100	89-100	79-100	63-96	42-67	24-43
	32-80	*Sandy clay loam, loam, clay loam	*SC, CL-ML, SC-SM	*A-6, A-7-6, A-5, A-4	0	0	95-100	84-100	61-100	28-61	18-45	4-25

Table 16.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
JbC:												
Junaluska-------	0-5	*Fine sandy loam, loam, channery fine sandy loam	*SM	*A-4, A-7-6, A-5, A-2-4	0-7	4-29	65-96	64-96	54-93	23-47	20-42	2-12
	5-21	*Sandy clay loam, channery clay loam, channery loam	*SC, CL	*A-6, A-7-6	0-3	4-27	67-96	66-96	52-91	28-56	27-45	12-25
	21-36	*Flaggy fine sandy loam, channery fine sandy loam, channery loam	*SC	*A-6, A-4	4-12	11-23	80-91	79-91	72-91	31-43	24-35	9-16
	36-80	*Weathered bedrock			---	---	---	---	---	---	---	---
Brasstown-------	0-6	*Channery loam, channery fine sandy loam, loam	*SC-SM, ML	*A-4, A-6	0	1-24	69-99	68-99	55-93	38-68	20-42	2-12
	6-36	*Loam, clay loam, channery clay loam, channery loam	*CL	*A-6, A-7-6	0-4	0-18	81-99	81-99	66-98	49-76	27-45	12-25
	36-45	*Loam, channery very fine sandy loam, channery fine sandy loam	*CL	*A-4	0-4	0-24	74-99	73-99	60-93	41-68	18-32	4-13
	45-80	*Weathered bedrock			---	---	---	---	---	---	---	---
JbD:												
Junaluska-------	0-2	*Fine sandy loam, loam, channery fine sandy loam	*SM	*A-4, A-6	0-9	1-20	80-98	80-98	68-96	29-48	20-42	2-12
	2-11	*Fine sandy loam, loam, channery fine sandy loam	*SC-SM	*A-4, A-6	0-9	1-21	81-98	81-98	68-96	29-48	20-42	2-12
	11-21	*Sandy clay loam, channery clay loam, channery loam	*SC	*A-6, A-7-6	0-8	1-20	80-98	80-98	63-94	34-58	27-45	12-25
	21-26	*Fine sandy loam, loam, silt loam	*SC-SM	*A-4, A-6	0-9	1-28	73-98	73-98	61-98	26-54	16-35	2-16
	26-80	*Weathered bedrock			---	---	---	---	---	---	---	---

Table 16.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
JbD:												
Brasstown-------	0-6	*Channery loam, channery fine sandy loam, loam	*SM, ML	*A-4, A-5	0	1-24	69-99	68-99	55-93	38-68	20-42	2-12
	6-36	*Loam, clay loam, channery clay loam, channery loam	*CL	*A-6, A-7-6	0-4	0-18	81-99	81-99	66-98	49-76	27-45	12-25
	36-45	*Loam, channery very fine sandy loam, channery fine sandy loam	*CL	*A-4	0-4	0-24	74-99	73-99	60-93	41-68	18-32	4-13
	45-80	*Weathered bedrock			---	---	---	---	---	---	---	---
JbE:												
Junaluska-------	0-2	*Fine sandy loam, loam, channery fine sandy loam	*SM	*A-4, A-6	0-9	1-20	80-98	80-98	68-96	29-48	20-42	2-12
	2-11	*Fine sandy loam, loam, channery fine sandy loam	*SC-SM	*A-4, A-6	0-9	1-21	81-98	81-98	68-96	29-48	20-42	2-12
	11-21	*Sandy clay loam, channery clay loam, channery loam	*SC	*A-6, A-7-6	0-8	1-20	80-98	80-98	63-94	34-58	27-45	12-25
	21-26	*Fine sandy loam, loam, silt loam	*SC-SM	*A-4, A-6	0-9	1-28	73-98	73-98	61-98	26-54	16-35	2-16
	26-80	*Weathered bedrock			---	---	---	---	---	---	---	---
Brasstown-------	0-6	*Channery loam, channery fine sandy loam, loam	*SM, ML	*A-4, A-5	0	1-24	69-99	68-99	55-93	38-68	20-42	2-12
	6-36	*Loam, clay loam, channery clay loam, channery loam	*CL	*A-6, A-7-6	0-4	0-18	81-99	81-99	66-98	49-76	27-45	12-25
	36-45	*Loam, channery very fine sandy loam, channery fine sandy loam	*CL	*A-4	0-4	0-24	74-99	73-99	60-93	41-68	18-32	4-13
	45-80	*Weathered bedrock			---	---	---	---	---	---	---	---
JnD. Junaluska-Brasstown-Urban land												

Table 16.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
JtD:												
Junaluska-------	0-5	*Fine sandy loam, loam, channery fine sandy loam	*SC-SM	*A-4, A-2-4	0-5	0-22	78-99	77-99	65-97	28-49	20-42	2-12
	5-21	*Sandy clay loam, channery clay loam, channery loam	*SC, CL	*A-6, A-7-6	0-5	0-22	78-99	77-99	60-94	33-59	28-45	12-25
	21-36	*Stratified fine sandy loam to sandy clay loam, loam, channery loam, channery fine sandy loam	*SC-SM	*A-4	0-5	0-21	77-99	76-99	65-99	28-55	16-35	2-16
	36-80	*Weathered bedrock			---	---	---	---	---	---	---	---
Tsali-----------	0-8	*Channery loam, channery fine sandy loam	*SC	*A-6, A-5, A-4	0-5	12-21	77-87	76-87	54-74	35-53	20-43	2-13
	8-13	*Channery loam, channery clay loam, channery sandy clay loam	*CL, SC	*A-6, A-7-6	0-5	12-22	76-86	75-86	61-85	45-66	27-44	12-25
	13-18	*Channery loam, channery clay loam, channery sandy clay loam	*CL, SC	*A-6, A-7-6	0-5	12-22	76-86	75-86	61-85	45-66	27-44	12-25
	18-80	*Weathered bedrock			---	---	---	---	---	---	---	---
JtE:												
Junaluska-------	0-5	*Fine sandy loam, loam, channery fine sandy loam	*SC-SM	*A-4, A-2-4	0-5	0-22	78-99	77-99	65-97	28-49	20-42	2-12
	5-21	*Sandy clay loam, channery clay loam, channery loam	*SC, CL	*A-6, A-7-6	0-5	0-22	78-99	77-99	60-94	33-59	28-45	12-25
	21-36	*Stratified fine sandy loam to sandy clay loam, loam, channery loam, channery fine sandy loam	*SC-SM	*A-4	0-5	0-21	77-99	76-99	65-99	28-55	16-35	2-16
	36-80	*Weathered bedrock			---	---	---	---	---	---	---	---

Table 16.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
JtE:												
Tsali-----------	0-8	*Channery loam, channery fine sandy loam	*SC	*A-6, A-2-4, A-5	0-5	12-21	77-87	76-87	54-74	35-53	20-43	2-13
	8-13	*Channery loam, channery clay loam, channery sandy clay loam	*CL, SC	*A-6, A-7-6	0-5	12-22	76-86	75-86	61-85	45-66	27-44	12-25
	13-18	*Channery loam, channery clay loam, channery sandy clay loam	*CL, SC	*A-6, A-7-6	0-5	12-22	76-86	75-86	61-85	45-66	27-44	12-25
	18-80	*Weathered bedrock			---	---	---	---	---	---	---	---
JtF:												
Junaluska-------	0-5	*Fine sandy loam, loam, channery fine sandy loam	*SC-SM	*A-4, A-2-4	0-5	0-22	78-99	77-99	65-97	28-49	20-42	2-12
	5-21	*Sandy clay loam, channery clay loam, channery loam	*SC, SC, CL	*A-6, A-7-6	0-5	0-22	78-99	77-99	60-94	33-59	28-45	12-25
	21-36	*Stratified fine sandy loam to sandy clay loam, loam, channery loam, channery fine sandy loam	*SC-SM	*A-4	0-5	0-22	78-99	77-99	66-99	28-55	16-35	2-16
	36-80	*Weathered bedrock			---	---	---	---	---	---	---	---
Tsali-----------	0-8	*Channery loam, channery fine sandy loam	*SC,	*A-6, A-2-4, A-5	0-5	12-21	77-87	76-87	54-74	35-53	20-43	2-13
	8-13	*Channery loam, channery clay loam, channery sandy clay loam	*CL, SC	*A-6, A-7-6	0-5	12-22	76-86	75-86	61-85	45-66	27-44	12-25
	13-18	*Channery loam, channery clay loam, channery sandy clay loam	*CL, SC	*A-6, A-7-6	0-5	12-22	76-86	75-86	61-85	45-66	27-44	12-25
	18-80	*Weathered bedrock			---	---	---	---	---	---	---	---

Table 16.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
LnC:												
Lonon, bouldery-	0-7	*Channery loam, loam, fine sandy loam	*CL, ML	*A-4	0-5	0-21	77-99	76-99	65-98	40-66	31-52	3-13
	7-30	*Channery clay loam, clay loam, sandy clay loam, loam	*CL, SC	*A-6	0-5	0-22	76-99	75-99	59-95	44-75	27-44	12-25
	30-40	*Channery clay loam, channery loam, channery sandy clay loam	*CL, SC	*A-6	0-8	0-23	75-99	74-99	60-97	45-77	27-44	12-25
	40-80	*Channery loam, very channery sandy clay loam, very channery clay loam	*CL, SC, GC	*A-6	0-15	0-24	73-99	72-99	60-99	45-79	27-44	12-25
Northcove, bouldery-------	0-7	*Very channery loam, very flaggy loam, very stony loam, very flaggy sandy loam	*SC-SM, SM, GM, GC-GM	*A-4, A-2-4	6-26	24-35	53-73	52-72	40-65	26-45	29-50	2-11
	7-30	*Very channery loam, very flaggy loam, very stony loam, very flaggy sandy loam	*GC, SC-SM, GM, GC-GM	*A-2-4, A-4, A-1-b	7-47	23-42	51-75	50-75	38-66	24-45	16-31	2-12
	30-80	*Extremely stony sandy loam, very cobbly sandy loam, extremely stony loam, very stony loamy sand	*GC-GM, SM, GM	*A-1-b, A-2-4	14-41	20-36	23-79	21-79	15-68	7-38	0-30	NP-12
LnD:												
Lonon, bouldery-	0-7	*Channery loam, loam, fine sandy loam	*CL, ML	*A-4	0-5	0-21	77-99	76-99	65-98	40-66	31-52	3-13
	7-30	*Channery clay loam, clay loam, sandy clay loam, loam	*CL, SC	*A-6	0-5	0-22	76-99	75-99	59-95	44-75	27-44	12-25
	30-40	*Channery clay loam, channery loam, channery sandy clay loam	*CL, SC	*A-6	0-8	0-23	75-99	74-99	60-97	45-77	27-44	12-25
	40-80	*Channery loam, very channery sandy clay loam, very channery clay loam	*CL, SC, GC	*A-6	4-15	12-24	73-90	72-90	60-90	45-72	27-44	12-25

Table 16.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
LnD:												
Northcove, bouldery-------	0-7	*Very channery loam, very flaggy loam, very stony loam, very flaggy sandy loam	*SC-SM, SM, GM, GC-GM	*A-4, A-2-4	6-26	24-35	53-73	52-72	40-65	26-45	29-50	2-11
	7-30	*Very channery loam, very flaggy loam, very stony loam, very flaggy sandy loam	*GC, SC-SM, GM, GC-GM	*A-2-4, A-4, A-1-b	7-47	23-42	51-75	50-75	38-66	24-45	16-31	2-12
	30-80	*Extremely stony sandy loam, very cobbly sandy loam, extremely stony loam, very stony loamy sand	*GC-GM, SM, GM	*A-1-b, A-2-4	14-41	20-36	23-79	21-79	15-68	7-38	0-30	NP-12
LtD:												
Luftee, very rocky, windswept------	0-11	*Very channery loam, channery silt loam, channery loam	*GM, GC-GM, SC-SM	*A-2-7	0	24-44	22-69	21-68	17-66	12-50	44-79	7-17
	11-34	*Extremely channery loam, extremely channery sandy loam, very channery loam	*GM, SC, SC-SM	*A-2-4, A-4	0	26-47	13-65	11-65	9-63	6-47	24-52	3-17
	34-80	*Unweathered bedrock			---	---	---	---	---	---	---	---
Anakeesta, very rocky, windswept------	0-14	*Channery loam, channery silt loam	*GM, GC-GM, SC-SM	*A-2-7	0	24-36	43-69	42-68	35-66	24-50	44-79	7-17
	14-45	*Extremely channery loam, extremely channery sandy loam, very channery loam	*GM, SC-SM, SC	*A-2-4, A-4	0	26-47	13-65	11-65	9-63	6-47	24-52	3-17
	45-80	*Unweathered bedrock			---	---	---	---	---	---	---	---

Table 16.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
LtE:												
Luftee, very rocky, windswept------	0-11	*Very channery loam, channery silt loam, channery loam	*GM, GC-GM, SC-SM	*A-2-7	0	24-44	22-69	21-68	17-66	12-50	44-79	7-17
	11-34	*Extremely channery loam, extremely channery sandy loam, very channery loam	*GM, SC, SC-SM	*A-2-4, A-4	0	26-47	13-65	11-65	9-63	6-47	24-52	3-17
	34-80	*Unweathered bedrock			---	---	---	---	---	---	---	---
Anakeesta, very rocky, windswept------	0-14	*Channery loam, channery silt loam	*GM, SC-SM	*A-2-7	0	24-36	43-69	42-68	35-66	24-50	44-79	7-17
	14-45	*Extremely channery loam, extremely channery sandy loam, very channery loam	*GM, SC-SM, SC	*A-2-4, A-4	0	26-47	13-65	11-65	9-63	6-47	24-52	3-17
	45-80	*Unweathered bedrock			---	---	---	---	---	---	---	---
LtF:												
Luftee, very rocky, windswept------	0-11	*Very channery loam, channery silt loam, channery loam	*GM, GM, SC-SM	*A-2-7	0	24-44	22-69	21-68	17-66	12-50	44-79	7-17
	11-34	*Extremely channery loam, extremely channery sandy loam, very channery loam	*GM, SC, SC-SM	*A-2-4, A-4	0	26-47	13-65	11-65	9-63	6-47	24-52	3-17
	34-80	*Unweathered bedrock			---	---	---	---	---	---	---	---
Anakeesta, very rocky, windswept------	0-14	*Channery loam, channery silt loam	*GM, GC-GM, SC-SM	*A-2-7	0	24-36	43-69	42-68	35-66	24-50	44-79	7-17
	14-45	*Extremely channery loam, very channery loam, extremely channery sandy loam	*GM, SC-SM, SC	*A-2-4, A-4	0	11-47	13-81	11-81	9-78	6-58	24-52	3-17
	45-80	*Unweathered bedrock			---	---	---	---	---	---	---	---

Table 16.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments >10 inches	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
NtE:												
Northcove, very bouldery-------	0-7	*Very channery loam, very flaggy loam, very stony loam, very flaggy sandy loam	*SC-SM, SM, GM, GC-GM	*A-4, A-2-4	12-26	23-35	53-78	52-78	40-70	26-49	29-50	2-11
	7-30	*Very channery loam, very flaggy loam, very stony loam, very flaggy sandy loam	*GC, SC-SM, GM, GC-GM	*A-2-4, A-4, A-1-b	7-47	23-42	51-75	50-75	38-66	24-45	16-31	2-12
	30-80	*Extremely stony sandy loam, very cobbly sandy loam, extremely stony loam, very stony loamy sand	*SC-SM, SM, GM	*A-2-4, A-1-b	28-46	13-32	26-88	24-88	16-76	7-42	0-30	NP-12
Lonon, very bouldery-------	0-7	*Channery loam, loam, fine sandy loam	*CL, ML	*A-4	0-5	0-21	77-99	76-99	65-98	40-66	31-52	3-13
	7-30	*Channery clay loam, clay loam, sandy clay loam, loam	*CL, SC	*A-6	0-5	0-22	76-99	75-99	59-95	44-75	27-44	12-25
	30-40	*Channery clay loam, channery loam, channery sandy clay loam	*CL, SC	*A-6	0-8	0-23	75-99	74-99	60-97	45-77	27-44	12-25
	40-80	*Channery loam, very channery sandy clay loam, very channery clay loam	*CL, SC, GC	*A-6	0-15	0-24	73-99	72-99	60-99	45-79	27-44	12-25
RdA:												
Reddies, occasionally flooded--------	0-14	*Sandy loam, gravelly fine sandy loam, loam, fine sandy loam	*SM, ML	*A-4	0	0-4	90-100	66-98	53-92	31-60	25-50	2-11
	14-26	*Fine sandy loam, sandy loam, gravelly sandy loam	*SC-SM	*A-2-4, A-4, A-1-b	0-1	0-11	78-98	47-96	40-94	17-48	17-31	2-12
	26-80	*Very gravelly sand, extremely gravelly sand, very cobbly sand	*SP, SP-SM, GP	*A-1-b, A-1-a	0-13	13-29	47-76	7-60	6-47	0-6	0-19	NP-2

Table 16.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
SbE:												
Snowbird, stony	0-7	*Loam	*ML, SM, MH	*A-5, A-7-5, A-4	0-1	0-9	91-99	91-99	71-94	48-69	27-64	2-14
	7-33	*Loam, sandy clay loam, clay loam	*CL	*A-6, A-7-6	0	0	98-100	82-98	69-98	50-76	27-45	12-25
	33-52	*Channery sandy loam, loam, channery loam	*SC-SM, SM, SC	*A-4, A-6	0-8	6-20	81-93	80-93	58-80	30-47	16-30	2-12
	52-80	*Weathered bedrock			---	---	---	---	---	---	---	---
SbF:												
Snowbird, stony	0-7	*Loam	*ML, SM, MH	*A-5, A-7-5, A-4	0-1	0-9	91-99	91-99	71-94	48-69	27-64	2-14
	7-33	*Loam, sandy clay loam, clay loam	*CL	*A-6, A-7-6	0	0	98-100	82-98	69-98	50-76	27-45	12-25
	33-52	*Channery sandy loam, loam, channery loam	*SC-SM, SM, SC	*A-4, A-6	0-8	6-20	81-93	80-93	58-80	30-47	16-30	2-12
	52-80	*Weathered bedrock			---	---	---	---	---	---	---	---
ScD:												
Soco, stony	0-5	*Channery fine sandy loam, channery loam, fine sandy loam	*SM	*A-2-4, A-5	0-8	1-24	78-98	77-98	58-86	28-49	20-42	2-12
	5-24	*Fine sandy loam, channery fine sandy loam, channery loam, loam	*SC-SM, CL	*A-4, A-6	0-4	1-21	77-98	76-98	65-98	28-52	16-34	2-15
	24-35	*Channery fine sandy loam, fine sandy loam, channery loam	*SC-SM, SM, SC	*A-2-4, A-6	0-10	1-26	74-98	73-98	62-96	27-48	16-31	2-12
	35-80	*Weathered bedrock			---	---	---	---	---	---	---	---
Stecoah, stony	0-5	*Channery fine sandy loam, fine sandy loam, channery loam	*SM, ML, GM	*A-4, A-5	0-9	1-24	78-98	77-98	63-92	35-58	20-42	2-12
	5-22	*Loam, fine sandy loam, channery fine sandy loam, channery loam	*CL-ML, CL, SC, SC-SM, SM	*A-4, A-6	0-9	1-20	81-98	81-98	65-96	45-71	16-34	2-15
	22-45	*Channery loam, fine sandy loam, loam, channery fine sandy loam	*SC-SM, SM, ML	*A-4	2-14	3-25	73-98	72-98	58-92	40-67	16-30	2-12
	45-80	*Weathered bedrock			---	---	---	---	---	---	---	---

Table 16.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
ScE:												
Soco, stony-----	0-5	*Channery fine sandy loam, channery loam, fine sandy loam	*SM	*A-2-4, A-5	0-8	1-24	78-98	77-98	58-86	28-49	20-42	2-12
	5-24	*Fine sandy loam, channery fine sandy loam, channery loam, loam	*SC-SM, CL	*A-4, A-6	0-4	1-21	77-98	76-98	65-98	28-52	16-34	2-15
	24-35	*Channery fine sandy loam, fine sandy loam, channery loam	*SC-SM, SM, SC	*A-2-4, A-6	0-10	1-26	74-98	73-98	62-96	27-48	16-31	2-12
	35-80	*Weathered bedrock			---	---	---	---	---	---	---	---
Stecoah, stony--	0-5	*Channery fine sandy loam, fine sandy loam, channery loam	*SM, ML, GM	*A-4, A-5	0-9	1-24	78-98	77-98	63-92	35-58	20-42	2-12
	5-22	*Loam, fine sandy loam, channery fine sandy loam, channery loam	*CL-ML, CL, SC, SC-SM, SM	*A-4, A-6	0-9	1-20	81-98	81-98	66-97	44-71	16-34	2-15
	22-45	*Channery loam, fine sandy loam, loam, channery fine sandy loam	*SC-SM, SM, ML	*A-4	2-14	3-25	73-98	72-98	58-92	40-67	16-30	2-12
	45-80	*Weathered bedrock			---	---	---	---	---	---	---	---
ScF:												
Soco, stony-----	0-5	*Channery fine sandy loam, fine sandy loam, channery loam	*SM, GM	*A-2-4, A-5	2-15	3-27	73-98	73-98	61-96	26-48	20-42	2-12
	5-24	*Fine sandy loam, loam, silt loam	*SC-SM, CL	*A-4, A-6	0-4	1-10	91-98	91-98	77-98	33-52	16-34	2-15
	24-35	*Channery fine sandy loam, channery loam, channery silt loam	*SC-SM, SM, SC	*A-2-4, A-6	2-14	3-25	73-98	72-98	61-96	26-48	16-31	2-12
	35-80	*Weathered bedrock			---	---	---	---	---	---	---	---
Stecoah, stony--	0-5	*Channery loam, loam, channery fine sandy loam	*ML, SM, GM	*A-4, A-5	2-15	3-24	77-98	76-98	62-92	42-67	20-42	2-12
	5-22	*Channery loam, channery fine sandy loam, loam	*CL-ML, CL, SC, SC-SM, SM	*A-4, A-6	2-15	3-27	73-98	73-98	59-96	40-71	16-34	2-15
	22-45	*Channery loam, channery fine sandy loam, loam	*CL-ML, SM, ML	*A-4	2-14	3-25	73-98	72-98	58-92	40-67	16-30	2-12
	45-80	*Weathered bedrock			---	---	---	---	---	---	---	---

Table 16.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
SdD:												
Soco, rocky-----	0-5	*Channery fine sandy loam, loam, channery loam	*SM, GM	*A-2-4, A-5	0-15	1-27	73-98	73-98	61-96	26-48	20-42	2-12
	5-24	*Fine sandy loam, loam, silt loam	*SC-SM, CL	*A-4, A-6	0-4	1-10	91-98	91-98	77-98	33-52	16-34	2-15
	24-35	*Channery fine sandy loam, channery loam, channery silt loam	*SC-SM, SM, SC	*A-2-4, A-6	2-14	3-25	73-98	72-98	61-96	26-48	16-31	2-12
	35-80	*Weathered bedrock			---	---	---	---	---	---	---	---
Stecoah, rocky--	0-5	*Channery loam, fine sandy loam, channery fine sandy loam	*ML, SM, GM	*A-4, A-5	2-15	3-26	74-98	73-98	59-92	41-67	20-42	2-12
	5-22	*Channery loam, channery fine sandy loam, loam	*CL-ML, CL, SC, SC-SM, SM	*A-4, A-6	2-15	3-25	76-98	75-98	61-96	42-71	16-34	2-15
	22-45	*Channery loam, channery fine sandy loam, loam	*CL-ML, SM, SC-SM	*A-4	2-14	3-25	73-98	72-98	58-92	40-67	16-30	2-12
	45-80	*Weathered bedrock			---	---	---	---	---	---	---	---
SdE:												
Soco, rocky-----	0-5	*Channery fine sandy loam, loam, channery loam	*SM, GM	*A-2-4, A-5	0-15	1-27	73-98	73-98	61-96	26-48	20-42	2-12
	5-24	*Fine sandy loam, loam, silt loam	*SC-SM, CL	*A-4, A-6	0-4	1-10	91-98	91-98	77-98	33-52	16-34	2-15
	24-35	*Channery fine sandy loam, channery loam, channery silt loam	*SC-SM, SM, SC	*A-2-4, A-6	2-14	3-25	73-98	72-98	61-96	26-48	16-31	2-12
	35-80	*Weathered bedrock			---	---	---	---	---	---	---	---
Stecoah, rocky--	0-5	*Channery loam, loam, channery fine sandy loam	*ML, SM, GM	*A-4, A-5	2-15	3-24	77-98	76-98	62-92	42-67	20-42	2-12
	5-22	*Channery loam, channery fine sandy loam, loam	*CL-ML, CL, SC, SC-SM, SM	*A-4, A-6	2-15	3-24	77-98	76-98	62-96	42-71	16-34	2-15
	22-45	*Channery loam, channery fine sandy loam, loam	*CL-ML, SM, SC-SM	*A-4	2-14	3-25	73-98	72-98	58-92	40-67	16-30	2-12
	45-80	*Weathered bedrock			---	---	---	---	---	---	---	---

Table 16.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
SdF:												
Soco, rocky-----	0-5	*Channery fine sandy loam, channery loam, fine sandy loam	*SM	*A-2-4, A-5	0-8	1-24	78-98	77-98	58-86	28-49	20-42	2-12
	5-24	*Fine sandy loam, channery fine sandy loam, channery loam, loam	*SC-SM, CL	*A-4, A-6	0-4	1-21	77-98	76-98	65-98	28-52	16-34	2-15
	24-35	*Channery fine sandy loam, fine sandy loam, channery loam	*SC-SM, SM, SC	*A-2-4, A-6	0-10	1-26	74-98	73-98	62-96	27-48	16-31	2-12
	35-80	*Weathered bedrock			---	---	---	---	---	---	---	---
Stecoah, rocky--	0-5	*Channery fine sandy loam, fine sandy loam, channery loam	*SM, ML, GM	*A-4, A-5	0-9	1-23	77-98	77-98	62-92	35-58	20-42	2-12
	5-22	*Loam, fine sandy loam, channery fine sandy loam, channery loam	*CL-ML, CL, SC, SC-SM, SM	*A-4, A-6	0-9	1-20	81-98	81-98	65-96	45-71	16-34	2-15
	22-45	*Channery loam, fine sandy loam, loam, channery fine sandy loam	*SC-SM, SM, ML	*A-4	2-14	3-25	73-98	72-98	59-93	39-67	16-30	2-12
	45-80	*Weathered bedrock			---	---	---	---	---	---	---	---
SnD:												
Soco, stony, windswept------	0-3	*Channery loam, loam, channery fine sandy loam	*ML, SM, GM	*A-4, A-5	0-7	1-23	77-98	76-98	61-92	42-67	20-42	2-12
	3-23	*Fine sandy loam, loam, silt loam	*SC-SM, SM, SC, CL	*A-4, A-6	0-7	1-23	77-98	76-98	64-98	28-52	17-34	2-15
	23-80	*Weathered bedrock			---	---	---	---	---	---	---	---
Stecoah, stony, windswept------	0-5	*Channery loam, fine sandy loam, channery fine sandy loam	*ML, SM, GM	*A-4, A-5	2-13	3-23	77-98	77-98	62-92	42-67	18-46	2-12
	5-22	*Channery fine sandy loam, channery loam, loam	*SC-SM, CL, SC, ML, SM	*A-4, A-6	2-13	3-23	77-98	77-98	65-98	28-52	17-34	2-15
	22-45	*Channery fine sandy loam, channery loam, loam	*SC-SM, SM	*A-2-4	2-14	3-25	73-98	72-98	61-96	26-48	16-30	2-12
	45-80	*Weathered bedrock			---	---	---	---	---	---	---	---

Table 16.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
SnE:												
Soco, stony, windswept------	0-3	*Channery loam, loam, channery fine sandy loam	*ML, SM, GM	*A-4, A-5	0-7	1-23	77-98	76-98	61-92	42-67	20-42	2-12
	3-23	*Fine sandy loam, loam, silt loam	*SC-SM, SM, SC, CL	*A-4, A-6	0-7	1-23	77-98	76-98	64-98	28-52	17-34	2-15
	23-80	*Weathered bedrock			---	---	---	---	---	---	---	---
Stecoah, stony, windswept------	0-5	*Channery loam, fine sandy loam, channery fine sandy loam	*ML, SM, GM	*A-4, A-5	2-13	3-23	77-98	77-98	62-92	42-67	20-42	2-12
	5-22	*Channery fine sandy loam, channery loam, loam	*SC-SM, CL, SC, ML, SM	*A-4, A-6	2-13	3-23	77-98	77-98	65-98	28-52	17-34	2-15
	22-45	*Channery fine sandy loam, channery loam, loam	*SC-SM, SM	*A-2-4	2-14	3-25	73-98	72-98	61-96	26-48	16-30	2-12
	45-80	*Weathered bedrock			---	---	---	---	---	---	---	---
SpE:												
Spivey, very bouldery-------	0-12	*Very flaggy loam, flaggy loam, extremely flaggy loam	*SM, GM	*A-5, A-2-5, A-1-a	0-41	13-36	21-86	19-86	15-81	10-59	34-63	2-13
	12-80	*Very flaggy loam, very stony sandy loam, very stony loam, extremely flaggy loam	*CL, GM	*A-4, A-2-4, A-1-b	27-62	15-36	22-88	20-87	16-83	11-60	18-41	2-13
Santeetlah, very bouldery--	0-17	*Loam, channery loam, flaggy loam	*OH	*A-7-5, A-4	0-17	0-30	77-99	76-99	64-92	46-68	35-66	9-15
	17-39	*Loam, clay loam, sandy clay loam	*CL	*A-6	0-10	0-16	89-99	89-99	75-94	55-72	28-40	12-20
	39-49	*Channery loam, channery clay loam, channery sandy clay loam	*CL, SC	*A-6, A-4	0-9	12-30	69-87	69-87	57-85	40-64	22-38	7-19
	49-80	*Very channery loam, flaggy loam, very flaggy loam	*SC, SM, SC-SM, ML	*A-6, A-2-4	4-24	11-36	58-91	57-91	45-85	31-63	18-34	3-16

Table 16.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	Percentage passing sieve number--: 10	Percentage passing sieve number--: 40	Percentage passing sieve number--: 200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
SpF:												
Spivey, very bouldery-------	0-12	*Very flaggy loam, flaggy loam, extremely flaggy loam	*SM, GM	*A-5, A-2-5, A-1-a	0-41	13-36	21-86	19-86	15-81	10-59	34-63	2-13
	12-80	*Very flaggy loam, very stony sandy loam, very stony loam, extremely flaggy loam	*CL, GM	*A-4, A-2-4, A-1-b	27-62	15-36	22-88	20-87	16-83	11-60	18-41	2-13
Santeetlah, very bouldery--	0-17	*Loam, channery loam, flaggy loam	*OH	*A-7-5, A-4	0-17	0-30	77-99	76-99	64-92	46-68	35-66	9-15
	17-39	*Loam, clay loam, sandy clay loam	*CL	*A-6	0-10	0-15	91-99	91-99	76-94	56-72	28-40	12-20
	39-49	*Channery loam, channery sandy clay loam	*CL, SC	*A-6, A-4	0-7	12-30	69-87	69-87	57-82	40-61	22-35	7-16
	49-80	*Very channery loam, flaggy loam, very flaggy loam	*SC, SM, SC-SM, ML	*A-6, A-2-4	4-24	11-36	58-91	57-91	45-85	31-63	18-34	3-16
SvC:												
Spivey, bouldery	0-12	*Very flaggy loam, flaggy loam, extremely flaggy loam	*SM, GM	*A-5, A-2-5, A-1-a	0-41	13-36	21-86	19-86	15-81	10-59	34-63	2-13
	12-80	*Very flaggy loam, very stony sandy loam, very stony loam, extremely flaggy loam	*CL, GM	*A-4, A-2-4, A-1-b	27-62	15-36	22-88	20-87	16-83	11-60	18-41	2-13
Whiteoak, bouldery-------	0-9	*Loam, channery loam	*ML	*A-7-5, A-4	0-9	0-21	81-99	81-99	68-92	49-68	35-66	9-15
	9-46	*Loam, clay loam, sandy clay loam	*CL	*A-6	0-10	0-17	88-99	88-99	74-94	55-72	28-40	12-20
	46-80	*Very channery loam, very flaggy loam, flaggy loam	*SC, SM, SC-SM, ML	*A-6, A-2-4	4-19	11-32	58-91	57-91	45-89	31-67	18-38	3-19
SvD:												
Spivey, bouldery	0-12	*Very flaggy loam, flaggy loam, extremely flaggy loam	*SM, GM	*A-5, A-2-5, A-1-a	0-41	13-36	21-86	19-86	15-81	10-59	34-63	2-13
	12-80	*Very flaggy loam, very stony sandy loam, very stony loam, extremely flaggy loam	*CL, GM	*A-4, A-2-4, A-1-b	27-62	15-36	22-88	20-87	16-83	11-60	18-41	2-13

Table 16.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
SvD:												
Whiteoak, bouldery-------	0-9	*Loam, channery loam	*ML	*A-7-5, A-4	0-9	0-21	81-99	81-99	68-92	49-68	35-66	9-15
	9-46	*Loam, clay loam, sandy clay loam	*CL	*A-6	0-10	0-17	88-99	88-99	74-94	55-72	28-40	12-20
	46-80	*Very channery loam, very flaggy loam, flaggy loam	*SC, SM, SC-SM, ML	*A-6, A-2-4	4-19	11-32	58-91	57-91	45-89	31-67	18-38	3-19
SwB:												
Statler, rarely flooded--------	0-8	*Loam	*ML, CL	*A-4, A-6	0	0	95-100	73-98	60-91	42-66	29-48	5-13
	8-36	*Clay loam, silt loam, loam	*CL	*A-6, A-7-6	0	0	95-100	73-98	59-96	45-77	27-45	12-25
	36-50	*Loam, clay loam, sandy clay loam	*CL, CL-ML	*A-6, A-7-6, A-4	0	0-4	95-98	73-96	62-96	44-73	24-41	9-21
	50-80	*Loam, fine sandy loam, clay loam	*CL, SC-SM, SC, CL-ML	*A-6, A-4	0	0-9	91-98	70-96	56-94	39-71	22-40	7-21
SyD:												
Sylco, very rocky----------	0-4	*Very channery loam, channery silt loam	*GM, SC, GC	*A-6, A-4	0-16	15-38	46-82	45-82	38-75	27-55	29-46	9-15
	4-22	*Very channery silt loam, very channery loam, very flaggy loam	*CL, GC	*A-6	2-16	13-39	49-82	48-81	43-81	36-70	26-37	9-17
	22-80	*Unweathered bedrock			---	---	---	---	---	---	---	---
Cataska, very rocky----------	0-4	*Very channery loam, very channery silt loam	*GM, GC-GM	*A-6	4-16	26-40	48-69	47-68	39-63	28-47	26-45	7-15
	4-16	*Very channery loam, very flaggy loam, very channery silt loam	*CL, GC-GM	*A-6, A-2-4	8-16	25-39	49-73	48-72	41-69	31-55	22-34	7-15
	16-28	*Weathered bedrock			---	---	---	---	---	---	---	---
	28-80	*Unweathered bedrock			---	---	---	---	---	---	---	---

Table 16.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
SyE:												
Sylco, very rocky----------	0-4	*Very channery loam, channery silt loam	*GM, SC, GC	*A-6, A-4	0-16	15-38	46-82	45-82	38-77	27-57	29-47	9-17
	4-22	*Very channery silt loam, very channery loam, very flaggy loam	*CL, GC-GM, GC	*A-6	2-16	13-39	49-82	48-81	43-81	36-70	26-37	9-17
	22-80	*Unweathered bedrock			---	---	---	---	---	---	---	---
Cataska, very rocky----------	0-4	*Very channery loam, very channery silt loam	*GM, GC-GM	*A-6	4-16	26-40	48-69	47-68	39-63	28-47	26-45	7-15
	4-16	*Very channery loam, very flaggy loam, very channery silt loam	*CL, GC-GM	*A-6, A-2-4	8-16	25-39	49-73	48-72	41-69	31-55	22-34	7-15
	16-28	*Weathered bedrock			---	---	---	---	---	---	---	---
	28-80	*Unweathered bedrock			---	---	---	---	---	---	---	---
SyF:												
Sylco, very rocky----------	0-4	*Very channery loam, channery silt loam	*GM, SC, GC	*A-6, A-4	0-16	15-38	46-82	45-82	38-77	27-57	29-47	9-17
	4-22	*Very channery silt loam, very channery loam, very flaggy loam	*CL, GC-GM, GC	*A-6	2-16	13-39	49-82	48-81	43-81	36-70	26-37	9-17
	22-80	*Unweathered bedrock			---	---	---	---	---	---	---	---
SyF:												
Cataska, very rocky----------	0-4	*Very channery loam, very channery silt loam	*GM, GC-GM	*A-6	4-16	26-40	48-69	47-68	39-63	28-47	26-45	7-15
	4-16	*Very channery loam, very flaggy loam, very channery silt loam	*CL, GC-GM	*A-6, A-2-4	8-16	25-39	49-73	48-72	41-69	31-55	22-34	7-15
	16-28	*Weathered bedrock			---	---	---	---	---	---	---	---
	28-80	*Unweathered bedrock			---	---	---	---	---	---	---	---
ThB:												
Thurmont--------	0-4	*Loam, fine sandy loam	*CL, SC-SM	*A-6	0	0-3	91-98	80-96	61-87	38-60	27-52	6-17
	4-35	*Sandy clay loam, clay loam, loam	*CL, SC	*A-6, A-7-6	0	0-3	91-98	81-96	63-91	37-60	28-45	12-25
	35-42	*Sandy clay loam, clay loam, loam	*SC, CL	*A-6, A-7-6, A-2-6	0	0-3	87-98	73-96	57-92	31-57	28-45	12-25
	42-48	*Sandy loam, gravelly sandy loam, loam	*SC-SM	*A-2-4	0	0-3	85-98	63-96	44-79	19-42	16-30	2-12
	48-80	*Sandy loam, loamy sand, gravelly sandy loam, cobbly sandy loam	*SC	*A-2-4, A-1-b	0	0-15	72-98	56-96	40-79	20-43	20-31	6-13

Table 16.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
ThB:												
Dillard---------	0-7	*Loam, sandy clay loam	*CL, ML	*A-6	0	0-1	95-98	84-96	67-92	47-69	25-47	6-17
	7-50	*Clay loam, loam, sandy clay loam	*CL	*A-6, A-7-6	0	0-1	95-98	82-97	66-94	50-75	28-45	12-25
	50-80	*Sandy loam, loam, sandy clay loam	*SC-SM	*A-2-4	0	0-3	93-98	80-96	55-87	25-50	16-37	2-18
UdD:												
Udorthents------	0-80	*Channery loam, fine sandy loam, loam, channery fine sandy loam	*SC-SM, SM, ML	*A-4	2-14	3-25	73-98	72-98	58-92	40-67	16-30	2-12
Urban land.												
UdE:												
Udorthents------	0-80	*Channery loam, fine sandy loam, loam, channery fine sandy loam	*SC-SM, SM, ML	*A-4	2-14	3-25	73-98	72-98	58-92	40-67	16-30	2-12
Urban land.												
UnB:												
Unison----------	0-10	*Loam, fine sandy loam	*ML, CL-ML, CL	*A-6, A-4	0	0-11	90-100	80-100	65-96	45-71	25-47	6-17
	10-49	*Clay, clay loam, sandy clay loam	*CH, CL	*A-7-6, A-6	0	0-11	90-100	80-100	62-100	51-99	39-73	21-47
	49-80	*Gravelly clay loam, clay loam, very gravelly clay loam, gravelly sandy clay loam	*CL, SC-SM	*A-6	0-1	0-12	68-97	42-95	35-92	27-73	30-44	15-25
UnC:												
Unison----------	0-10	*Loam, fine sandy loam	*ML, CL-ML, CL	*A-6, A-4	0	0-11	90-100	80-100	65-96	45-71	25-47	6-17
	10-49	*Clay, clay loam, sandy clay loam	*CH, CL	*A-7-6, A-6	0	0-11	90-100	80-100	62-100	51-99	39-73	21-47
	49-80	*Gravelly clay loam, very gravelly clay loam, gravelly sandy clay loam	*CL, SC-SM	*A-6	0-1	0-7	72-97	45-95	37-92	29-73	30-44	15-25

Table 16.—Engineering Index Properties—Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
UoA:												
Udorthents, rarely flooded-	0-80	*Channery loam, fine sandy loam, loam, channery fine sandy loam	*SC-SM, SM, ML	*A-4	2-14	3-25	73-98	72-98	58-92	40-67	16-30	2-12
Urban land, rarely flooded.												
W.												
Water												

Table 17.—Physical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T
	In	Pct	g/cc	In/hr	In/in	Pct	Pct			
AkB:										
Alarka, occasionally flooded----------	0-3	3-18	0.20-0.50	6-20	0.45-0.55	0.0-2.9	60-100	---	---	4
	3-10	3-18	0.20-0.50	6-20	0.35-0.45	0.0-2.9	60-100	---	---	
	10-13	18-34	1.45-1.55	0.2-0.6	0.17-0.19	0.0-2.9	0.5-4.0	.32	.32	
	13-21	18-35	1.45-1.55	0.2-0.6	0.17-0.19	0.0-2.9	0.1-1.5	.37	.37	
	21-36	5-20	1.45-1.55	0.2-0.6	0.17-0.19	0.0-2.9	0.0-1.0	.49	.49	
	36-80	5-15	1.50-1.60	2-6	0.04-0.06	0.0-2.9	0.0-1.0	.05	.20	
Wesser, occasionally flooded----------	0-3	5-18	0.20-0.50	6-20	0.35-0.45	0.0-2.9	60-100	---	---	2
	3-6	5-23	1.45-1.55	0.6-2	0.20-0.22	0.0-2.9	6.0-15	.28	.28	
	6-13	3-15	1.55-1.65	6-20	0.10-0.12	0.0-2.9	4.0-8.0	.10	.10	
	13-19	1-10	1.60-1.70	6-20	0.06-0.08	0.0-2.9	1.0-5.0	.02	.02	
	19-80	1-10	1.60-1.70	6-20	0.06-0.08	0.0-2.9	0.5-3.0	.02	.02	
BkB2:										
Braddock, moderately eroded	0-11	27-40	1.20-1.50	0.6-2	0.14-0.19	0.0-2.9	0.0-2.0	.28	.28	5
	11-57	35-55	1.20-1.50	0.6-2	0.12-0.17	3.0-5.9	0.0-1.0	.20	.20	
	57-80	18-35	1.20-1.50	0.6-6	0.06-0.12	0.0-2.9	0.0-1.0	.32	.32	
BkC2:										
Braddock, moderately eroded	0-11	27-40	1.20-1.50	0.6-2	0.14-0.19	0.0-2.9	0.0-2.0	.28	.28	5
	11-57	35-55	1.20-1.50	0.6-2	0.12-0.17	3.0-5.9	0.0-1.0	.20	.20	
	57-80	18-35	1.20-1.50	0.6-6	0.06-0.12	0.0-2.9	0.0-1.0	.32	.32	
BkD2:										
Braddock, moderately eroded	0-11	27-40	1.20-1.50	0.6-2	0.14-0.19	0.0-2.9	0.0-2.0	.28	.28	5
	11-57	35-55	1.20-1.50	0.6-2	0.12-0.17	3.0-5.9	0.0-1.0	.20	.20	
	57-80	18-35	1.20-1.50	0.6-6	0.06-0.12	0.0-2.9	0.0-1.0	.32	.32	
Thurmont----------	0-4	10-25	1.20-1.40	2-6	0.10-0.15	0.0-2.9	3.0-8.0	.17	.17	5
	4-35	18-35	1.30-1.50	0.6-2	0.13-0.19	0.0-2.9	0.5-1.0	.24	.24	
	35-42	18-35	1.30-1.50	0.6-2	0.13-0.19	0.0-2.9	0.5-1.0	.20	.20	
	42-48	5-18	1.35-1.55	2-6	0.08-0.15	0.0-2.9	0.0-0.5	.28	.28	
	48-80	10-20	1.20-1.40	0.6-2	0.04-0.08	0.0-2.9	0.0-0.2	.24	.24	
Udorthents--------	0-80	5-18	1.40-1.65	2-6	0.10-0.15	0.0-2.9	0.0-0.5	.20	.43	5
Urban land.										
BnC:										
Braddock, moderately eroded	0-11	27-40	1.20-1.50	0.6-2	0.14-0.19	0.0-2.9	0.5-1.0	.20	.20	5
	11-57	35-55	1.20-1.50	0.6-2	0.12-0.17	3.0-5.9	0.0-1.0	.20	.20	
	57-80	18-35	1.20-1.50	0.6-6	0.06-0.12	0.0-2.9	0.0-1.0	.32	.32	
Urban land.										

Table 17.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T
	In	Pct	g/cc	In/hr	In/in	Pct	Pct			
BuC:										
Breakneck, very rocky, windswept	0-12	12-27	0.50-1.00	2-6	0.12-0.17	0.0-2.9	10-20	.15	.24	2
	12-28	10-25	1.00-1.50	2-6	0.10-0.18	0.0-2.9	3.0-8.0	.15	.24	
	28-80	---	---	---	0.00-0.01	---	---	---	---	
Pullback, very rocky, windswept	0-8	12-27	0.50-1.00	2-6	0.12-0.17	0.0-2.9	10-20	.24	.24	1
	8-16	7-25	1.00-1.50	2-6	0.10-0.18	0.0-2.9	3.0-8.0	.17	.24	
	16-80	---	---	---	0.00-0.01	---	---	---	---	
BuD:										
Breakneck, very rocky, windswept	0-12	12-27	0.50-1.00	2-6	0.12-0.17	0.0-2.9	10-20	.15	.24	2
	12-28	10-25	1.00-1.50	2-6	0.10-0.18	0.0-2.9	3.0-8.0	.15	.24	
	28-80	---	---	---	0.00-0.01	---	---	---	---	
Pullback, very rocky, windswept	0-8	12-27	0.50-1.00	2-6	0.12-0.17	0.0-2.9	10-20	.24	.24	1
	8-16	7-25	1.00-1.50	2-6	0.10-0.18	0.0-2.9	3.0-8.0	.17	.24	
	16-80	---	---	---	0.00-0.01	---	---	---	---	
BuE:										
Breakneck, very rocky, windswept	0-12	12-27	0.50-1.00	2-6	0.12-0.17	0.0-2.9	10-20	.15	.20	2
	12-28	10-24	1.00-1.50	2-6	0.10-0.18	0.0-2.9	3.0-8.0	.15	.24	
	28-80	---	---	---	0.00-0.01	---	---	---	---	
Pullback, very rocky, windswept	0-8	12-27	0.50-1.00	2-6	0.12-0.17	0.0-2.9	10-20	.24	.24	1
	8-16	7-24	1.00-1.50	2-6	0.10-0.18	0.0-2.9	3.0-8.0	.17	.24	
	16-80	---	---	---	0.00-0.01	---	---	---	---	
BuF:										
Breakneck, very rocky, windswept	0-12	12-27	0.50-1.00	2-6	0.12-0.17	0.0-2.9	10-20	.15	.24	2
	12-28	10-23	1.00-1.50	2-6	0.10-0.18	0.0-2.9	3.0-8.0	.15	.24	
	28-80	---	---	---	0.00-0.01	---	---	---	---	
Pullback, very rocky, windswept	0-8	12-27	0.50-1.00	2-6	0.12-0.17	0.0-2.9	10-20	.24	.24	1
	8-16	7-24	1.00-1.50	2-6	0.10-0.18	0.0-2.9	3.0-8.0	.17	.24	
	16-80	---	---	---	0.00-0.01	---	---	---	---	
ChE:										
Cheoah, stony	0-17	5-18	1.35-1.60	2-6	0.12-0.18	0.0-2.9	6.0-15	.15	.24	4
	17-36	5-20	1.35-1.60	2-6	0.14-0.22	0.0-2.9	0.0-1.0	.20	.32	
	36-47	5-18	1.35-1.60	2-6	0.11-0.17	0.0-2.9	0.0-0.5	.20	.37	
	47-80	---	---	---	0.00-0.01	---	---	---	---	
ChF:										
Cheoah, stony	0-17	5-18	1.35-1.60	2-6	0.12-0.18	0.0-2.9	6.0-15	.15	.24	4
	17-36	5-18	1.35-1.60	2-6	0.14-0.22	0.0-2.9	0.0-1.0	.32	.32	
	36-47	5-18	1.35-1.60	2-6	0.11-0.17	0.0-2.9	0.0-0.5	.20	.37	
	47-80	---	---	---	0.00-0.01	---	---	---	---	
CrD:										
Cheoah, rocky	0-12	5-18	1.35-1.60	2-6	0.12-0.18	0.0-2.9	6.0-15	.10	.15	4
	12-47	5-18	1.35-1.60	2-6	0.14-0.22	0.0-2.9	0.5-3.0	.24	.24	
	47-56	5-18	1.35-1.60	2-6	0.11-0.17	0.0-2.9	0.0-0.5	.20	.37	
	56-80	---	---	---	0.00-0.01	---	---	---	---	

Table 17.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors Kw	Erosion factors Kf	Erosion factors T
	In	Pct	g/cc	In/hr	In/in	Pct	Pct			
CrD:										
Jeffrey, rocky----	0-8	10-18	1.45-1.55	0.6-6	0.10-0.15	0.0-2.9	6.0-15	.05	.10	2
	8-32	8-24	1.45-1.55	0.6-6	0.07-0.13	0.0-2.9	1.0-2.0	.20	.37	
	32-80	---	---	---	0.00-0.01	---	---	---	---	
CrE:										
Cheoah, rocky-----	0-12	5-18	1.35-1.60	2-6	0.12-0.18	0.0-2.9	6.0-15	.10	.15	4
	12-47	8-23	1.35-1.60	2-6	0.14-0.22	0.0-2.9	0.5-3.0	.24	.24	
	47-56	5-18	1.35-1.60	2-6	0.11-0.17	0.0-2.9	0.0-0.5	.20	.37	
	56-80	---	---	---	0.00-0.01	---	---	---	---	
Jeffrey, rocky----	0-8	10-18	1.45-1.55	0.6-6	0.10-0.15	0.0-2.9	6.0-15	.05	.10	2
	8-32	8-24	1.45-1.55	0.6-6	0.07-0.13	0.0-2.9	1.0-2.0	.20	.37	
	32-80	---	---	---	0.00-0.01	---	---	---	---	
CsF:										
Cheoah, very rocky	0-12	5-18	1.35-1.60	2-6	0.12-0.18	0.0-2.9	6.0-15	.10	.17	4
	12-47	5-18	1.35-1.60	2-6	0.14-0.22	0.0-2.9	0.5-3.0	.17	.28	
	47-56	5-20	1.35-1.60	2-6	0.11-0.17	0.0-2.9	0.0-0.5	.20	.37	
	56-80	---	---	---	0.00-0.01	---	---	---	---	
Jeffrey, very rocky------------	0-8	10-18	1.45-1.55	0.6-6	0.10-0.15	0.0-2.9	6.0-15	.15	.20	2
	8-27	8-15	1.45-1.55	0.6-6	0.07-0.13	0.0-2.9	1.0-2.0	.24	.43	
	27-34	8-20	1.40-1.65	0.6-2	0.10-0.15	0.0-2.9	0.0-0.5	.10	.24	
	34-80	---	---	---	0.00-0.01	---	---	---	---	
CwA:										
Cullowhee, occasionally flooded----------	0-13	5-18	1.30-1.50	2-6	0.12-0.18	0.0-2.9	6.0-15	.15	.15	2
	13-23	2-8	1.35-1.55	6-20	0.05-0.08	0.0-2.9	0.5-2.0	.24	.24	
	23-35	5-12	1.35-1.55	6-20	0.05-0.10	0.0-2.9	0.0-1.0	.10	.10	
	35-80	1-5	1.40-1.60	6-20	0.02-0.05	0.0-2.9	0.0-0.5	.02	.02	
Ela, occasionally flooded----------	0-15	5-18	1.30-1.50	2-6	0.13-0.20	0.0-2.9	8.0-15	.37	.37	3
	15-28	5-18	1.30-1.50	2-6	0.10-0.15	0.0-2.9	5.0-12	.10	.24	
	28-80	5-15	1.40-1.60	6-20	0.02-0.05	0.0-2.9	0.0-0.5	.02	.24	
DAM.										
Dam										
DeB:										
Dellwood, occassionally flooded----------	0-8	5-15	1.30-1.50	2-6	0.08-0.12	0.0-2.9	6.0-10	.10	.17	3
	8-16	1-8	1.40-1.60	6-20	0.02-0.05	0.0-2.9	3.0-6.0	.02	.02	
	16-80	1-4	1.40-1.60	6-20	0.02-0.05	0.0-2.9	0.0-1.0	.02	.02	
Reddies, occassionally flooded----------	0-14	5-18	1.30-1.50	2-6	0.10-0.18	0.0-2.9	6.0-10	.20	.20	3
	14-26	5-18	1.35-1.55	2-6	0.08-0.15	0.0-2.9	0.5-1.0	.28	.28	
	26-80	1-5	1.40-1.60	6-20	0.02-0.05	0.0-2.9	0.0-0.5	.02	.02	
DrB:										
Dillard, rarely flooded----------	0-7	10-25	1.20-1.50	0.6-2	0.15-0.20	0.0-2.9	2.0-8.0	.24	.24	5
	7-50	18-35	1.40-1.60	0.6-2	0.12-0.16	0.0-2.9	0.0-1.0	.32	.32	
	50-80	5-26	1.35-1.55	2-6	0.08-0.15	0.0-2.9	0.0-1.0	.24	.24	

Table 17.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors Kw	Kf	T
	In	Pct	g/cc	In/hr	In/in	Pct	Pct			
DtD:										
Ditney, very stony	0-7	5-18	1.50-1.65	2-6	0.07-0.12	0.0-2.9	1.0-8.0	.10	.15	2
	7-25	5-18	1.50-1.65	2-6	0.10-0.15	0.0-2.9	0.0-1.0	.28	.28	
	25-30	5-18	1.50-1.65	2-6	0.05-0.13	0.0-2.9	0.0-1.0	.15	.28	
	30-80	---	---	---	0.00-0.01	---	---	---	---	
Unicoi, very stony	0-5	5-20	1.45-1.55	2-6	0.08-0.12	0.0-2.9	2.0-6.0	.15	.24	1
	5-16	5-20	1.45-1.60	2-6	0.04-0.09	0.0-2.9	0.0-1.0	.05	.24	
	16-80	---	---	---	0.00-0.01	---	---	---	---	
Rock outcrop.										
DtE:										
Ditney, very stony	0-6	5-18	1.50-1.65	2-6	0.07-0.12	0.0-2.9	1.0-8.0	.10	.15	2
	6-30	5-18	1.50-1.65	2-6	0.10-0.15	0.0-2.9	0.0-1.0	.20	.32	
	30-80	---	---	---	0.00-0.01	---	---	---	---	
Unicoi, very stony	0-4	5-20	1.45-1.55	2-6	0.08-0.12	0.0-2.9	2.0-6.0	.15	.20	1
	4-15	5-20	1.45-1.60	2-6	0.04-0.09	0.0-2.9	0.0-1.0	.10	.28	
	16-80	---	---	---	0.00-0.01	---	---	---	---	
Rock outcrop.										
DtF:										
Ditney, very stony	0-6	5-18	1.50-1.65	2-6	0.07-0.12	0.0-2.9	1.0-8.0	.10	.15	2
	6-30	5-18	1.50-1.65	2-6	0.10-0.15	0.0-2.9	0.0-1.0	.20	.32	
	30-80	---	---	---	0.00-0.01	---	---	---	---	
Unicoi, very stony	0-5	5-20	1.45-1.55	2-6	0.08-0.12	0.0-2.9	2.0-6.0	.10	.20	1
	5-16	5-20	1.45-1.60	2-6	0.04-0.09	0.0-2.9	0.0-1.0	.10	.28	
	16-80	---	---	---	0.00-0.01	---	---	---	---	
Rock outcrop.										
EtA:										
Ela, occasionally flooded----------	0-16	5-18	1.30-1.50	2-6	0.13-0.20	0.0-2.9	8.0-15	.37	.37	3
	16-32	5-18	1.30-1.50	2-6	0.10-0.15	0.0-2.9	5.0-12	.24	.24	
	32-80	5-15	1.40-1.60	6-20	0.02-0.05	0.0-2.9	0.0-0.5	.02	.24	
Ela, undrained----	0-16	5-18	1.30-1.50	2-6	0.13-0.20	0.0-2.9	8.0-15	.37	.37	3
	16-32	5-18	1.30-1.50	2-6	0.10-0.15	0.0-2.9	5.0-12	.24	.24	
	32-80	5-15	1.40-1.60	6-20	0.02-0.05	0.0-2.9	0.0-0.5	.02	.24	
FvA:										
Fluvaquents, ponded-----------	0-80	8-35	1.20-1.45	0.2-0.6	0.12-0.20	0.0-2.9	0.0-0.5	.24	.24	5
HcD:										
Heintooga, bouldery---------	0-12	12-27	0.50-1.00	2-6	0.08-0.16	0.0-2.9	10-20	.05	.20	5
	12-25	5-15	1.00-1.50	2-6	0.04-0.06	0.0-2.9	0.0-1.0	.05	.28	
	25-80	5-15	1.00-1.50	2-6	0.03-0.05	0.0-2.9	0.0-1.0	.02	.20	
Chiltoskie, bouldery---------	0-8	12-27	0.66-1.30	2-6	0.17-0.22	0.0-2.9	10-20	.20	.20	4
	8-43	10-25	1.28-1.52	2-6	0.18-0.20	0.0-2.9	0.0-1.0	.43	.43	
	43-80	5-15	1.30-1.45	2-6	0.07-0.09	0.0-2.9	0.0-1.0	.10	.28	

Table 17.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T
	In	Pct	g/cc	In/hr	In/in	Pct	Pct			
HdE:										
Heintooga, very bouldery----------	0-12	10-27	0.50-1.00	2-6	0.08-0.16	0.0-2.9	10-20	.05	.20	5
	12-25	5-15	1.00-1.50	2-6	0.04-0.06	0.0-2.9	0.0-1.0	.05	.28	
	25-80	5-15	1.00-1.50	2-6	0.03-0.05	0.0-2.9	0.0-1.0	.02	.20	
Chiltoskie, very bouldery----------	0-8	12-27	0.66-1.30	2-6	0.17-0.22	0.0-2.9	10-20	.20	.20	4
	8-43	10-24	1.28-1.52	2-6	0.18-0.20	0.0-2.9	0.0-1.0	.43	.43	
	43-80	5-15	1.30-1.45	2-6	0.07-0.09	0.0-2.9	0.0-1.0	.10	.28	
HmA:										
Hemphill, rarely flooded----------	0-8	8-30	1.20-1.45	0.6-2	0.15-0.24	0.0-2.9	4.0-10	.28	.28	5
	8-32	35-60	1.20-1.45	0.06-0.2	0.15-0.20	0.0-2.9	0.0-1.0	.28	.28	
	32-80	8-35	1.20-1.45	0.2-0.6	0.12-0.20	0.0-2.9	0.0-1.0	.28	.28	
Hemphill, undrained--------	0-8	8-30	1.20-1.45	0.6-2	0.15-0.24	0.0-2.9	8.0-15	.28	.28	5
	8-32	35-60	1.20-1.45	0.06-0.2	0.15-0.20	0.0-2.9	0.0-1.0	.28	.28	
	32-80	8-35	1.20-1.45	0.2-0.6	0.12-0.20	0.0-2.9	0.0-1.0	.28	.28	
JbC:										
Junaluska---------	0-5	5-18	1.35-1.60	2-6	0.10-0.15	0.0-2.9	2.0-6.0	.20	.20	3
	5-21	18-35	1.30-1.65	0.6-2	0.12-0.18	0.0-2.9	0.0-1.0	.20	.20	
	21-36	15-24	1.35-1.65	2-6	0.10-0.15	0.0-2.9	0.0-0.5	.15	.28	
	36-80	---	---	---	0.00-0.01	---	---	---	---	
Brasstown---------	0-6	5-18	1.00-1.40	2-6	0.12-0.18	0.0-2.9	2.0-6.0	.15	.28	4
	6-36	18-35	1.35-1.60	0.6-2	0.12-0.18	0.0-2.9	0.0-1.0	.32	.32	
	36-45	8-20	1.40-1.65	0.6-2	0.10-0.15	0.0-2.9	0.0-0.5	.49	.49	
	45-80	---	---	---	0.00-0.01	---	---	---	---	
JbD:										
Junaluska---------	0-2	5-18	1.35-1.60	2-6	0.12-0.20	0.0-2.9	2.0-6.0	.20	.20	3
	2-11	5-18	1.35-1.60	2-6	0.12-0.20	0.0-2.9	2.0-6.0	.20	.20	
	11-21	18-35	1.30-1.65	0.6-2	0.12-0.18	0.0-2.9	0.0-1.0	.20	.20	
	21-31	5-24	1.35-1.60	2-6	0.12-0.20	0.0-2.9	0.0-0.5	.37	.37	
	31-80	---	---	---	0.00-0.01	---	---	---	---	
Brasstown---------	0-6	5-18	1.00-1.40	2-6	0.12-0.18	0.0-2.9	2.0-6.0	.15	.28	4
	6-36	18-35	1.35-1.60	0.6-2	0.12-0.18	0.0-2.9	0.0-1.0	.32	.32	
	36-45	8-20	1.40-1.65	0.6-2	0.10-0.15	0.0-2.9	0.0-0.5	.49	.49	
	45-80	---	---	---	0.00-0.01	---	---	---	---	
JbE:										
Junaluska---------	0-2	5-18	1.35-1.60	2-6	0.12-0.20	0.0-2.9	2.0-6.0	.20	.20	3
	2-11	5-18	1.35-1.60	2-6	0.12-0.20	0.0-2.9	2.0-6.0	.20	.20	
	11-21	18-35	1.30-1.65	0.6-2	0.12-0.18	0.0-2.9	0.0-1.0	.24	.24	
	21-26	5-24	1.35-1.60	2-6	0.12-0.20	0.0-2.9	0.0-0.5	.37	.37	
	26-80	---	---	---	0.00-0.01	---	---	---	---	
Brasstown---------	0-6	5-18	1.00-1.40	2-6	0.12-0.18	0.0-2.9	2.0-6.0	.15	.28	4
	6-36	18-35	1.35-1.60	0.6-2	0.12-0.18	0.0-2.9	0.0-1.0	.32	.32	
	36-45	8-20	1.40-1.65	0.6-2	0.10-0.15	0.0-2.9	0.0-0.5	.49	.49	
	45-80	---	---	---	0.00-0.01	---	---	---	---	

Table 17.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T
	In	Pct	g/cc	In/hr	In/in	Pct	Pct			
JnD:										
Junaluska---------	0-2	5-18	1.35-1.60	2-6	0.12-0.20	0.0-2.9	2.0-6.0	.20	.20	3
	2-11	5-18	1.35-1.60	2-6	0.12-0.20	0.0-2.9	2.0-6.0	.20	.20	
	11-21	18-35	1.30-1.65	0.6-2	0.12-0.18	0.0-2.9	0.0-1.0	.24	.24	
	21-26	5-24	1.35-1.60	2-6	0.12-0.20	0.0-2.9	0.0-0.5	.37	.37	
	26-80	---	---	---	0.00-0.01	---	---	---	---	
Brasstown---------	0-6	5-18	1.00-1.40	2-6	0.12-0.18	0.0-2.9	2.0-6.0	.15	.28	4
	6-36	18-35	1.35-1.60	0.6-2	0.12-0.18	0.0-2.9	0.0-1.0	.32	.32	
	36-45	8-20	1.40-1.65	0.6-2	0.10-0.15	0.0-2.9	0.0-0.5	.49	.49	
	45-80	---	---	---	0.00-0.01	---	---	---	---	
Urban land.										
JtD:										
Junaluska---------	0-5	5-18	1.35-1.60	2-6	0.10-0.15	0.0-2.9	2.0-6.0	.20	.20	3
	5-21	18-35	1.30-1.65	0.6-2	0.12-0.18	0.0-2.9	0.5-1.0	.20	.20	
	21-36	5-24	1.35-1.65	2-6	0.10-0.15	0.0-2.9	0.0-0.5	.37	.37	
	36-80	---	---	---	0.00-0.01	---	---	---	---	
Tsali-------------	0-8	5-20	1.35-1.60	2-6	0.10-0.15	0.0-2.9	2.0-6.0	.15	.24	2
	8-13	18-35	1.30-1.50	0.6-2	0.12-0.18	0.0-2.9	0.0-0.5	.24	.37	
	13-18	18-35	1.30-1.50	0.6-2	0.12-0.18	0.0-2.9	0.0-0.5	.24	.37	
	18-80	---	---	---	0.00-0.01	---	---	---	---	
JtE:										
Junaluska---------	0-5	5-18	1.35-1.60	2-6	0.10-0.15	0.0-2.9	2.0-6.0	.20	.20	3
	5-21	18-35	1.30-1.65	0.6-2	0.12-0.18	0.0-2.9	0.5-1.0	.20	.20	
	21-36	5-24	1.35-1.65	2-6	0.10-0.15	0.0-2.9	0.0-0.5	.37	.37	
	36-80	---	---	---	0.00-0.01	---	---	---	---	
Tsali-------------	0-8	5-20	1.35-1.60	2-6	0.10-0.15	0.0-2.9	2.0-6.0	.15	.24	2
	8-13	18-35	1.30-1.50	0.6-2	0.12-0.18	0.0-2.9	0.0-0.5	.24	.37	
	13-18	18-35	1.30-1.50	0.6-2	0.12-0.18	0.0-2.9	0.0-0.5	.24	.37	
	18-80	---	---	---	0.00-0.01	---	---	---	---	
JtF:										
Junaluska---------	0-5	5-18	1.35-1.60	2-6	0.10-0.15	0.0-2.9	2.0-6.0	.20	.20	3
	5-21	18-35	1.30-1.65	0.6-2	0.12-0.18	0.0-2.9	0.5-1.0	.20	.20	
	21-36	5-24	1.35-1.65	2-6	0.10-0.15	0.0-2.9	0.0-0.5	.37	.37	
	36-80	---	---	---	0.00-0.01	---	---	---	---	
Tsali-------------	0-8	5-20	1.35-1.60	2-6	0.10-0.15	0.0-2.9	2.0-6.0	.15	.24	2
	8-13	18-35	1.30-1.50	0.6-2	0.12-0.18	0.0-2.9	0.0-0.5	.24	.37	
	13-18	18-35	1.30-1.50	0.6-2	0.12-0.18	0.0-2.9	0.0-0.5	.24	.37	
	18-80	---	---	---	0.00-0.01	---	---	---	---	
LnC:										
Lonon, bouldery---	0-7	7-20	1.35-1.60	2-6	0.14-0.20	0.0-2.9	6.0-10	.20	.28	5
	7-30	18-35	1.30-1.50	0.6-2	0.12-0.20	0.0-2.9	0.0-0.5	.20	.32	
	30-40	18-35	1.30-1.50	0.6-2	0.09-0.15	0.0-2.9	0.0-0.5	.20	.32	
	40-80	18-35	1.30-1.50	0.6-2	0.09-0.15	0.0-2.9	0.0-0.5	.17	.37	
Northcove, bouldery---------	0-7	5-18	1.30-1.50	2-6	0.06-0.11	0.0-2.9	6.0-10	.10	.20	5
	7-30	5-18	1.40-1.60	2-6	0.06-0.11	0.0-2.9	0.0-1.0	.10	.37	
	30-80	1-18	1.40-1.60	2-6	0.03-0.05	0.0-2.9	0.0-0.5	.05	.28	

Table 17.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors Kw	Kf	T
	In	Pct	g/cc	In/hr	In/in	Pct	Pct			
LnD:										
Lonon, bouldery---	0-7	7-20	1.35-1.60	2-6	0.14-0.20	0.0-2.9	6.0-10	.20	.28	5
	7-30	18-35	1.30-1.50	0.6-2	0.12-0.20	0.0-2.9	0.0-0.5	.20	.32	
	30-40	18-35	1.30-1.50	0.6-2	0.09-0.15	0.0-2.9	0.0-0.5	.20	.32	
	40-80	18-35	1.30-1.50	0.6-2	0.09-0.15	0.0-2.9	0.0-0.5	.17	.37	
Northcove, bouldery---------	0-7	5-18	1.30-1.50	2-6	0.06-0.11	0.0-2.9	6.0-10	.10	.20	5
	7-30	5-18	1.40-1.60	2-6	0.06-0.11	0.0-2.9	0.0-1.0	.10	.37	
	30-80	1-18	1.40-1.60	2-6	0.03-0.05	0.0-2.9	0.0-0.5	.05	.28	
LtD:										
Luftee, very rocky, windswept-	0-11	12-27	0.35-1.00	2-6	0.11-0.19	0.0-2.9	10-20	.10	.24	2
	11-34	7-25	1.00-1.60	2-6	0.03-0.18	0.0-2.9	3.0-8.0	.05	.28	
	34-80	---	---	---	0.00-0.01	---	---	---	---	
Anakeesta, very rocky, windswept-	0-14	12-27	0.35-1.00	2-6	0.11-0.19	0.0-2.9	10-20	.10	.20	3
	14-45	7-25	1.00-1.60	2-6	0.03-0.18	0.0-2.9	3.0-8.0	.05	.28	
	45-80	---	---	---	0.00-0.01	---	---	---	---	
LtE:										
Luftee, very rocky, windswept-	0-11	12-27	0.35-1.00	2-6	0.11-0.19	0.0-2.9	10-20	.10	.24	2
	11-34	7-25	1.00-1.60	2-6	0.03-0.18	0.0-2.9	3.0-8.0	.05	.28	
	34-80	---	---	---	0.00-0.01	---	---	---	---	
Anakeesta, very rocky, windswept-	0-14	12-27	0.35-1.00	2-6	0.11-0.19	0.0-2.9	10-20	.10	.20	3
	14-45	7-25	1.00-1.60	2-6	0.03-0.18	0.0-2.9	3.0-8.0	.05	.28	
	45-80	---	---	---	0.00-0.01	---	---	---	---	
LtF:										
Luftee, very rocky, windswept-	0-11	12-27	0.35-1.00	2-6	0.11-0.19	0.0-2.9	10-20	.10	.24	2
	11-34	7-25	1.00-1.60	2-6	0.03-0.18	0.0-2.9	3.0-8.0	.05	.28	
	34-80	---	---	---	0.00-0.01	---	---	---	---	
Anakeesta, very rocky, windswept-	0-14	12-27	0.35-1.00	2-6	0.11-0.19	0.0-2.9	10-20	.10	.20	3
	14-45	7-25	1.00-1.60	2-6	0.03-0.18	0.0-2.9	3.0-8.0	.05	.28	
	45-80	---	---	---	0.00-0.01	---	---	---	---	
NtE:										
Northcove, very bouldery---------	0-7	5-18	1.30-1.50	2-6	0.06-0.11	0.0-2.9	6.0-10	.05	.20	5
	7-30	5-18	1.40-1.60	2-6	0.06-0.11	0.0-2.9	0.0-1.0	.10	.37	
	30-80	1-18	1.40-1.60	2-6	0.03-0.05	0.0-2.9	0.0-0.5	.05	.28	
Lonon, very bouldery---------	0-7	7-20	1.35-1.60	2-6	0.14-0.20	0.0-2.9	6.0-10	.20	.28	5
	7-30	18-35	1.30-1.50	0.6-2	0.12-0.20	0.0-2.9	0.0-0.5	.20	.32	
	30-40	18-35	1.30-1.50	0.6-2	0.09-0.15	0.0-2.9	0.0-0.5	.20	.32	
	40-80	18-35	1.30-1.50	0.6-2	0.09-0.15	0.0-2.9	0.0-0.5	.17	.37	

Table 17.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T
	In	Pct	g/cc	In/hr	In/in	Pct	Pct			
RdA:										
Reddies, occasionally flooded----------	0-14	5-18	1.30-1.50	2-6	0.10-0.18	0.0-2.9	4.0-10	.20	.20	3
	14-26	5-18	1.35-1.55	2-6	0.08-0.15	0.0-2.9	0.5-1.0	.28	.28	
	26-80	1-5	1.40-1.60	6-20	0.02-0.05	0.0-2.9	0.0-0.5	.02	.02	
SbE:										
Snowbird, stony---	0-7	5-22	1.35-1.60	2-6	0.12-0.18	0.0-2.9	5.0-15	.24	.24	4
	7-33	18-35	1.40-1.60	0.6-2	0.12-0.16	0.0-2.9	0.0-1.0	.32	.32	
	33-52	5-18	1.40-1.65	2-6	0.09-0.15	0.0-2.9	0.0-0.5	.20	.32	
	52-80	---	---	---	0.00-0.01	---	---	---	---	
SbF:										
Snowbird, stony---	0-7	5-22	1.35-1.60	2-6	0.12-0.18	0.0-2.9	5.0-15	.24	.24	4
	7-33	18-35	1.40-1.60	0.6-2	0.12-0.16	0.0-2.9	0.0-1.0	.32	.32	
	33-52	5-18	1.40-1.65	2-6	0.09-0.15	0.0-2.9	0.0-0.5	.20	.32	
	52-80	---	---	---	0.00-0.01	---	---	---	---	
ScD:										
Soco, stony-------	0-5	5-18	1.35-1.60	2-6	0.11-0.17	0.0-2.9	2.0-6.0	.10	.17	3
	5-24	5-22	1.35-1.60	2-6	0.12-0.20	0.0-2.9	0.0-1.0	.32	.32	
	24-35	5-18	1.40-1.65	2-6	0.09-0.15	0.0-2.9	0.0-1.0	.20	.37	
	35-80	---	---	---	0.00-0.01	---	---	---	---	
Stecoah, stony----	0-5	5-18	1.35-1.60	2-6	0.11-0.17	0.0-2.9	2.0-6.0	.15	.24	4
	5-22	5-22	1.35-1.60	2-6	0.10-0.17	0.0-2.9	0.0-1.0	.43	.43	
	22-45	5-18	1.40-1.65	2-6	0.10-0.15	0.0-2.9	0.0-0.5	.20	.43	
	45-80	---	---	---	0.00-0.01	---	---	---	---	
ScE:										
Soco, stony-------	0-5	5-18	1.35-1.60	2-6	0.11-0.17	0.0-2.9	2.0-6.0	.10	.17	3
	5-24	5-22	1.35-1.60	2-6	0.12-0.20	0.0-2.9	0.0-1.0	.32	.32	
	24-35	5-18	1.40-1.65	2-6	0.09-0.15	0.0-2.9	0.0-1.0	.20	.37	
	35-80	---	---	---	0.00-0.01	---	---	---	---	
Stecoah, stony----	0-5	5-18	1.35-1.60	2-6	0.11-0.17	0.0-2.9	2.0-6.0	.15	.24	4
	5-22	5-22	1.35-1.60	2-6	0.10-0.17	0.0-2.9	0.0-1.0	.43	.43	
	22-45	5-18	1.40-1.65	2-6	0.10-0.15	0.0-2.9	0.0-0.5	.20	.43	
	45-80	---	---	---	0.00-0.01	---	---	---	---	
ScF:										
Soco, stony-------	0-5	5-18	1.35-1.60	2-6	0.11-0.17	0.0-2.9	2.0-6.0	.10	.15	3
	5-24	5-22	1.35-1.60	2-6	0.12-0.20	0.0-2.9	0.0-1.0	.32	.32	
	24-35	5-18	1.40-1.65	2-6	0.09-0.15	0.0-2.9	0.0-1.0	.17	.37	
	35-80	---	---	---	0.00-0.01	---	---	---	---	
Stecoah, stony----	0-5	5-18	1.35-1.60	2-6	0.11-0.17	0.0-2.9	2.0-6.0	.17	.28	4
	5-22	5-22	1.35-1.60	2-6	0.10-0.17	0.0-2.9	0.0-1.0	.28	.43	
	22-45	5-18	1.40-1.65	2-6	0.10-0.15	0.0-2.9	0.0-0.5	.24	.43	
	45-80	---	---	---	0.00-0.01	---	---	---	---	
SdD:										
Soco, rocky-------	0-5	5-18	1.35-1.60	2-6	0.11-0.17	0.0-2.9	2.0-6.0	.10	.15	3
	5-24	5-22	1.35-1.60	2-6	0.12-0.20	0.0-2.9	0.0-1.0	.32	.32	
	24-35	5-18	1.40-1.65	2-6	0.09-0.15	0.0-2.9	0.0-1.0	.17	.37	
	35-80	---	---	---	0.00-0.01	---	---	---	---	

Table 17.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors Kw	Kf	T
	In	Pct	g/cc	In/hr	In/in	Pct	Pct			
SdD:										
Stecoah, rocky----	0-5	5-18	1.35-1.60	2-6	0.11-0.17	0.0-2.9	2.0-6.0	.17	.28	4
	5-22	5-22	1.35-1.60	2-6	0.10-0.17	0.0-2.9	0.0-1.0	.28	.43	
	22-45	5-18	1.40-1.65	2-6	0.10-0.15	0.0-2.9	0.0-0.5	.24	.43	
	45-80	---	---	---	0.00-0.01	---	---	---	---	
SdE:										
Soco, rocky-------	0-5	5-18	1.35-1.60	2-6	0.11-0.17	0.0-2.9	2.0-6.0	.10	.15	3
	5-24	5-22	1.35-1.60	2-6	0.12-0.20	0.0-2.9	0.0-1.0	.32	.32	
	24-35	5-18	1.40-1.65	2-6	0.09-0.15	0.0-2.9	0.0-1.0	.17	.37	
	35-80	---	---	---	0.00-0.01	---	---	---	---	
Stecoah, rocky----	0-5	5-18	1.35-1.60	2-6	0.11-0.17	0.0-2.9	2.0-6.0	.17	.28	4
	5-22	5-22	1.35-1.60	2-6	0.10-0.17	0.0-2.9	0.0-1.0	.28	.43	
	22-45	5-18	1.40-1.65	2-6	0.10-0.15	0.0-2.9	0.0-0.5	.24	.43	
	45-80	---	---	---	0.00-0.01	---	---	---	---	
SdF:										
Soco, rocky-------	0-5	5-18	1.35-1.60	2-6	0.11-0.17	0.0-2.9	2.0-6.0	.10	.17	3
	5-24	5-22	1.35-1.60	2-6	0.12-0.20	0.0-2.9	0.0-1.0	.32	.32	
	24-35	5-18	1.40-1.65	2-6	0.09-0.15	0.0-2.9	0.0-1.0	.20	.37	
	35-80	---	---	---	0.00-0.01	---	---	---	---	
Stecoah, rocky----	0-5	5-18	1.35-1.60	2-6	0.11-0.17	0.0-2.9	2.0-6.0	.15	.24	4
	5-22	5-22	1.35-1.60	2-6	0.10-0.17	0.0-2.9	0.0-1.0	.43	.43	
	22-45	5-18	1.40-1.65	2-6	0.10-0.15	0.0-2.9	0.0-0.5	.20	.43	
	45-80	---	---	---	0.00-0.01	---	---	---	---	
SnD:										
Soco, stony, windswept--------	0-3	5-18	1.35-1.60	2-6	0.11-0.17	0.0-2.9	2.0-6.0	.15	.24	3
	3-23	5-22	1.35-1.60	2-6	0.12-0.20	0.0-2.9	0.5-1.0	.28	.28	
	23-80	---	---	---	0.00-0.01	---	---	---	---	
Stecoah, stony, windswept--------	0-5	5-18	1.35-1.60	2-6	0.11-0.17	0.0-2.9	1.0-8.0	.17	.28	4
	5-22	5-22	1.35-1.60	2-6	0.10-0.17	0.0-2.9	0.5-1.0	.17	.28	
	22-45	5-18	1.40-1.65	2-6	0.10-0.15	0.0-2.9	0.0-0.5	.15	.32	
	45-80	---	---	---	0.00-0.01	---	---	---	---	
SnE:										
Soco, stony, windswept--------	0-3	5-18	1.35-1.60	2-6	0.11-0.17	0.0-2.9	2.0-6.0	.15	.24	3
	3-23	5-22	1.35-1.60	2-6	0.12-0.20	0.0-2.9	0.5-1.0	.28	.28	
	23-80	---	---	---	0.00-0.01	---	---	---	---	
Stecoah, stony, windswept--------	0-5	5-18	1.35-1.60	2-6	0.11-0.17	0.0-2.9	2.0-6.0	.17	.28	4
	5-22	5-22	1.35-1.60	2-6	0.10-0.17	0.0-2.9	0.5-1.0	.17	.28	
	22-45	5-18	1.40-1.65	2-6	0.10-0.15	0.0-2.9	0.0-0.5	.15	.32	
	45-80	---	---	---	0.00-0.01	---	---	---	---	
SpE:										
Spivey, very bouldery---------	0-12	5-20	1.20-1.40	0.6-6	0.06-0.10	0.0-2.9	8.0-15	.10	.28	5
	12-80	5-20	1.30-1.50	0.6-6	0.07-0.11	0.0-2.9	1.0-5.0	.10	.32	
Santeetlah, very bouldery---------	0-17	15-24	1.35-1.60	2-6	0.12-0.18	0.0-2.9	5.0-15	.20	.20	4
	17-39	18-29	1.35-1.60	0.6-2	0.14-0.22	0.0-2.9	0.5-1.0	.32	.32	
	39-49	12-28	1.35-1.60	0.6-2	0.12-0.18	0.0-2.9	0.0-0.5	.20	.43	
	49-80	7-23	1.40-1.60	0.6-2	0.08-0.12	0.0-2.9	0.0-0.5	.15	.43	

Table 17.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T
	In	Pct	g/cc	In/hr	In/in	Pct	Pct			
SpF:										
Spivey, very bouldery----------	0-12	5-20	1.20-1.40	0.6-6	0.06-0.10	0.0-2.9	8.0-15	.10	.28	5
	12-80	5-20	1.30-1.50	0.6-6	0.07-0.11	0.0-2.9	1.0-5.0	.10	.32	
Santeetlah, very bouldery----------	0-17	15-24	1.35-1.60	2-6	0.12-0.18	0.0-2.9	5.0-15	.20	.20	4
	17-39	18-29	1.35-1.60	0.6-2	0.14-0.22	0.0-2.9	0.5-1.0	.32	.32	
	39-49	12-24	1.35-1.60	0.6-2	0.12-0.18	0.0-2.9	0.0-0.5	.20	.43	
	49-80	7-23	1.40-1.60	0.6-2	0.08-0.12	0.0-2.9	0.0-0.5	.15	.43	
SvC:										
Spivey, bouldery--	0-12	5-20	1.20-1.40	0.6-6	0.06-0.10	0.0-2.9	8.0-15	.10	.28	5
	12-80	5-20	1.30-1.50	0.6-6	0.07-0.11	0.0-2.9	1.0-5.0	.10	.32	
Whiteoak, bouldery	0-9	15-24	1.35-1.60	2-6	0.12-0.18	0.0-2.9	5.0-15	.24	.24	4
	9-46	18-29	1.35-1.60	0.6-2	0.14-0.22	0.0-2.9	0.5-1.0	.32	.32	
	46-80	7-27	1.40-1.60	0.6-2	0.08-0.12	0.0-2.9	0.0-0.5	.15	.43	
SvD:										
Spivey, bouldery--	0-12	5-20	1.20-1.40	0.6-6	0.06-0.10	0.0-2.9	8.0-15	.10	.28	5
	12-80	5-20	1.30-1.50	0.6-6	0.07-0.11	0.0-2.9	1.0-5.0	.10	.32	
Whiteoak, bouldery	0-9	15-24	1.35-1.60	2-6	0.12-0.18	0.0-2.9	5.0-15	.24	.24	4
	9-46	18-29	1.35-1.60	0.6-2	0.14-0.22	0.0-2.9	0.5-1.0	.32	.32	
	46-80	7-27	1.40-1.60	0.6-2	0.08-0.12	0.0-2.9	0.0-0.5	.15	.43	
SwB:										
Statler, rarely flooded----------	0-8	10-20	1.35-1.45	0.6-2	0.18-0.22	0.0-2.9	4.0-8.0	.28	.28	5
	8-36	18-35	1.35-1.50	0.6-2	0.17-0.20	0.0-2.9	0.0-1.0	.32	.32	
	36-50	15-30	1.35-1.50	0.6-2	0.17-0.20	0.0-2.9	0.0-1.0	.37	.37	
	50-80	12-30	1.35-1.50	0.6-6	0.14-0.18	0.0-2.9	0.0-0.5	.37	.37	
SyD:										
Sylco, very rocky-	0-4	15-23	1.00-1.20	2-6	0.11-0.16	0.0-2.9	2.0-6.0	.05	.24	2
	4-22	15-25	1.30-1.50	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.15	.43	
	22-80	---	---	---	0.00-0.01	---	---	---	---	
Cataska, very rocky------------	0-4	12-22	1.30-1.40	2-20	0.10-0.14	0.0-2.9	2.0-6.0	.10	.28	2
	4-16	12-22	1.30-1.45	2-20	0.04-0.09	0.0-2.9	0.0-1.0	.17	.49	
	16-28	---	---	---	0.00-0.01	---	---	---	---	
	28-80	---	---	---	0.00-0.01	---	---	---	---	
SyE:										
Sylco, very rocky-	0-4	15-25	1.00-1.20	2-6	0.11-0.16	0.0-2.9	2.0-6.0	.05	.24	2
	4-22	15-25	1.30-1.50	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.15	.43	
	22-80	---	---	---	0.00-0.01	---	---	---	---	
Cataska, very rocky------------	0-4	12-22	1.30-1.40	2-20	0.10-0.14	0.0-2.9	2.0-6.0	.10	.28	2
	4-16	12-22	1.30-1.45	2-20	0.04-0.09	0.0-2.9	0.0-1.0	.17	.49	
	16-28	---	---	---	0.00-0.01	---	---	---	---	
	28-80	---	---	---	0.00-0.01	---	---	---	---	
SyF:										
Sylco, very rocky-	0-4	15-25	1.00-1.20	2-6	0.11-0.16	0.0-2.9	2.0-6.0	.05	.24	2
	4-22	15-25	1.30-1.50	2-6	0.10-0.15	0.0-2.9	0.5-1.0	.15	.43	
	22-80	---	---	---	0.00-0.01	---	---	---	---	

Table 17.—Physical Properties of the Soils—Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors Kw	Kf	T
	In	Pct	g/cc	In/hr	In/in	Pct	Pct			
SyF:										
Cataska, very rocky------------	0-4	12-22	1.30-1.40	2-20	0.10-0.14	0.0-2.9	2.0-6.0	.10	.28	2
	4-16	12-22	1.30-1.45	2-20	0.04-0.09	0.0-2.9	0.0-1.0	.17	.49	
	16-28	---	---	---	0.00-0.01	---	---	---	---	
	28-80	---	---	---	0.00-0.01	---	---	---	---	
ThB:										
Thurmont----------	0-4	10-25	1.20-1.40	2-6	0.10-0.15	0.0-2.9	3.0-8.0	.15	.15	5
	4-35	18-35	1.30-1.50	0.6-2	0.13-0.19	0.0-2.9	0.5-1.0	.28	.28	
	35-42	18-35	1.30-1.50	0.6-2	0.13-0.19	0.0-2.9	0.5-1.0	.20	.20	
	42-48	15-20	1.35-1.55	2-6	0.08-0.15	0.0-2.9	0.0-0.5	.20	.20	
	48-80	5-20	1.20-1.40	0.6-2	0.04-0.08	0.0-2.9	0.0-0.2	.20	.20	
Dillard-----------	0-7	10-25	1.20-1.50	0.6-2	0.15-0.20	0.0-2.9	2.0-6.0	.24	.24	5
	7-50	18-35	1.40-1.60	0.6-2	0.12-0.16	0.0-2.9	0.5-1.0	.32	.32	
	50-80	5-26	1.35-1.55	2-6	0.08-0.15	0.0-2.9	0.0-0.5	.24	.24	
UdD:										
Udorthents--------	0-80	5-18	1.40-1.65	2-6	0.10-0.15	0.0-2.9	0.0-0.5	.20	.43	5
Urban land.										
UdE:										
Udorthents--------	0-80	5-18	1.40-1.65	2-6	0.10-0.15	0.0-2.9	0.0-0.5	.20	.43	5
Urban land.										
UnB:										
Unison------------	0-10	10-25	1.35-1.65	0.6-6	0.14-0.20	0.0-2.9	2.0-6.0	.24	.24	5
	10-49	30-65	1.30-1.60	0.6-2	0.12-0.18	3.0-5.9	0.0-1.0	.20	.20	
	49-80	22-35	1.40-1.80	2-6	0.07-0.12	0.0-2.9	0.0-0.5	.17	.28	
UnC:										
Unison------------	0-10	10-25	1.35-1.65	0.6-6	0.14-0.20	0.0-2.9	2.0-6.0	.24	.24	5
	10-49	30-65	1.30-1.60	0.6-2	0.12-0.18	3.0-5.9	0.0-1.0	.20	.20	
	49-80	22-35	1.40-1.80	2-6	0.07-0.12	0.0-2.9	0.0-0.5	.17	.28	
UoA:										
Udorthents, rarely flooded---	0-80	5-18	1.40-1.65	2-6	0.10-0.15	0.0-2.9	0.0-0.5	.20	.43	5
Urban land, rarely flooded.										
W.										
Water										

Table 18.—Chemical Soil Properties

(Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	Inches	meq/100 g	meq/100 g	pH
AkB:				
Alarka, occasionally flooded	0-3	---	102-172	2.5-3.5
	3-10	---	102-172	2.5-3.5
	10-13	---	4.2-13	3.6-4.4
	13-21	---	3.5-9.1	3.6-5.0
	21-36	---	0.9-5.4	4.5-5.5
	36-80	---	0.9-4.5	4.5-5.5
Wesser, occasionally flooded	0-3	---	102-172	2.5-3.5
	3-6	---	11-30	3.6-5.0
	6-13	---	7.3-16	3.6-5.0
	13-19	---	1.9-10	3.6-5.0
	19-80	---	1.0-6.9	3.6-5.0
BkB2:				
Braddock, moderately eroded	0-11	---	4.9-11	3.6-6.0
	11-57	---	6.6-12	3.6-5.5
	57-80	---	3.3-8.2	3.6-5.5
BkC2:				
Braddock, moderately eroded	0-11	---	4.9-11	3.6-6.0
	11-57	---	6.6-12	3.6-5.5
	57-80	---	3.3-8.2	3.6-5.5
BkD2:				
Braddock, moderately eroded	0-11	---	4.9-11	3.6-6.0
	11-57	---	6.6-12	3.6-5.5
	57-80	---	3.3-8.2	3.6-5.5
BnC:				
Braddock	0-11	---	4.9-11	3.6-6.0
	11-57	---	6.6-12	3.6-5.5
	57-80	---	3.3-8.2	3.6-5.5
Urban land.				
BuC:				
Breakneck, very rocky, windswept	0-12	---	19-39	3.6-5.5
	12-28	---	6.9-18	3.6-5.5
	28-80	---	---	---
Pullback, very rocky, windswept	0-8	---	19-39	3.6-5.5
	8-16	---	6.4-18	3.6-5.5
	16-80	---	---	---

Table 18.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	Inches	meq/100 g	meq/100 g	pH
BuD:				
Breakneck, very rocky, windswept----	0-12	---	19-39	3.6-5.5
	12-28	---	6.9-18	3.6-5.5
	28-80	---	---	---
Pullback, very rocky, windswept----	0-8	---	19-39	3.6-5.5
	8-16	---	6.4-18	3.6-5.5
	16-80	---	---	---
BuE:				
Breakneck, very rocky, windswept----	0-12	---	19-39	3.6-5.5
	12-28	---	6.9-18	3.6-5.5
	28-80	---	---	---
Pullback, very rocky, windswept----	0-8	---	19-39	3.6-5.5
	8-16	---	6.4-18	3.6-5.5
	16-80	---	---	---
BuF:				
Breakneck, very rocky, windswept----	0-12	---	19-39	3.6-5.5
	12-28	---	6.9-18	3.6-5.5
	28-80	---	---	---
Pullback, very rocky, windswept----	0-8	---	19-39	3.6-5.5
	8-16	---	6.4-18	3.6-5.5
	16-80	---	---	---
ChE:				
Cheoah, stony--------	0-17	---	11-29	3.6-5.5
	17-36	---	0.9-9.4	3.6-5.5
	36-47	---	0.9-4.2	3.6-5.5
	47-80	---	---	---
ChF:				
Cheoah, stony--------	0-17	---	11-29	3.6-5.5
	17-36	---	2.3-9.4	3.6-5.5
	36-47	---	0.9-4.2	3.6-5.5
	47-80	---	---	---
CrD:				
Cheoah, rocky--------	0-12	---	11-29	3.6-5.5
	12-47	---	2.3-9.4	3.6-5.5
	47-56	---	0.9-4.2	3.6-5.5
	56-80	---	---	---
Jeffrey, rocky-------	0-8	---	12-29	4.5-5.5
	8-32	---	3.2-7.9	4.5-5.5
	32-80	---	---	---

Table 18.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	Inches	meq/100 g	meq/100 g	pH
CrE:				
Cheoah, rocky--------	0-12	---	11-29	3.6-5.5
	12-47	---	2.3-9.4	3.6-5.5
	47-56	---	0.9-4.2	3.6-5.5
	56-80	---	---	---
Jeffrey, rocky-------	0-8	---	12-29	4.5-5.5
	8-32	---	3.2-7.9	4.5-5.5
	32-80	---	---	---
CsF:				
Cheoah, very rocky---	0-12	---	11-29	3.6-5.5
	12-47	---	2.3-9.4	3.6-5.5
	47-56	---	0.9-4.2	3.6-5.5
	56-80	---	---	---
Jeffrey, very rocky--	0-8	---	12-29	4.5-5.5
	8-27	---	3.2-7.9	4.5-5.5
	27-34	---	1.5-4.6	3.6-6.0
	34-80	---	---	---
CwA:				
Cullowhee, occasionally flooded	0-13	15-38	---	4.5-6.5
	13-23	1.6-6.5	---	4.5-6.5
	23-35	1.2-5.2	---	4.5-6.5
	35-80	0.2-2.4	---	4.5-6.5
Ela, occasionally Flooded-------------	0-15	19-38	---	4.5-6.5
	15-28	13-32	---	4.5-6.5
	28-80	1.2-4.9	---	4.5-6.5
DAM.				
Dam				
DeB:				
Dellwood, occasionally flooded-------------	0-8	15-26	---	4.5-7.3
	8-16	1.4-16	---	4.5-7.3
	16-80	0.2-3.2	---	4.5-7.3
Reddies, occasionally flooded-------------	0-14	15-27	---	4.5-7.3
	14-26	4.6-15	---	4.5-7.3
	26-80	0.2-2.4	---	4.5-7.3
DrB:				
Dillard, rarely flooded-------------	0-7	7.0-20	---	5.1-6.0
	7-50	---	4.2-8.2	4.5-5.8
	50-80	---	0.9-5.7	4.5-5.8

Table 18.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	Inches	meq/100 g	meq/100 g	pH
DtD:				
Ditney, very stony---	0-7	---	2.6-17	3.6-5.5
	7-25	---	0.9-5.1	3.6-5.5
	25-30	---	0.9-5.1	3.6-5.5
	30-80	---	---	---
Unicoi, very stony---	0-5	---	4.3-14	3.6-5.5
	5-16	---	0.9-5.4	3.6-5.5
	16-80	---	---	---
Rock outcrop.				
DtE:				
Ditney, very stony---	0-6	---	2.6-17	3.6-5.5
	6-30	---	0.9-5.1	3.6-5.5
	30-80	---	---	---
Unicoi, very stony---	0-4	---	4.3-14	3.6-5.5
	4-15	---	0.9-5.4	3.6-5.5
	16-80	---	---	---
Rock outcrop.				
DtF:				
Ditney, very stony---	0-6	---	2.6-17	3.6-5.5
	6-30	---	0.9-5.1	3.6-5.5
	30-80	---	---	---
Unicoi, very stony---	0-5	---	4.3-14	3.6-5.5
	5-16	---	0.9-5.4	3.6-5.5
	16-80	---	---	---
Rock outcrop.				
EtA:				
Ela, occasionally flooded-------------	0-16	19-38	---	4.5-6.5
	16-32	13-32	---	4.5-6.5
	32-80	1.2-4.9	---	4.5-6.5
Ela, undrained-------	0-16	19-38	---	4.5-6.5
	16-32	13-32	---	4.5-6.5
	32-80	1.2-4.9	---	4.5-6.5
FvA:				
Fluvaquents, ponded--	0-80	---	1.5-7.4	3.5-6.5
HcD:				
Heintooga, bouldery--	0-12	---	19-39	3.4-5.5
	12-25	---	0.9-13	3.4-5.5
	25-80	---	0.9-8.2	3.4-5.5
Chiltoskie, bouldery-	0-8	---	19-39	3.6-5.5
	8-43	---	1.9-6.2	3.6-5.5
	43-80	---	0.9-4.5	3.6-5.5

Table 18.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	Inches	meq/100 g	meq/100 g	pH
HdE:				
Heintooga, very bouldery	0-12	---	19-39	3.4-5.5
	12-25	---	0.9-13	3.4-5.5
	25-80	---	0.9-8.2	3.4-5.5
Chiltoskie, very bouldery	0-8	---	19-39	3.6-5.5
	8-43	---	1.9-6.2	3.6-5.5
	43-80	---	0.9-4.5	3.6-5.5
HmA:				
Hemphill, rarely flooded	0-8	4.5-17	---	4.5-7.3
	8-32	18-32	---	4.5-7.3
	32-80	4.1-19	---	4.5-7.3
Hemphill, undrained	0-8	4.5-17	---	4.5-7.3
	8-32	18-32	---	4.5-7.3
	32-80	4.1-19	---	4.5-7.3
JbC:				
Junaluska	0-5	---	4.3-14	3.6-6.0
	5-21	---	3.4-8.2	3.6-6.0
	21-36	---	2.8-5.3	3.6-6.0
	36-80	---	---	---
Brasstown	0-6	---	4.3-14	3.6-6.0
	6-36	---	3.4-8.2	3.6-6.0
	36-45	---	1.5-4.6	3.6-6.0
	45-80	---	---	---
JbD:				
Junaluska	0-2	---	4.3-14	3.6-5.5
	2-11	---	4.3-14	3.6-5.5
	11-21	---	3.4-8.2	3.6-6.0
	21-26	---	2.8-5.3	3.6-6.0
	26-80	---	---	---
Brasstown	0-6	---	4.3-14	3.6-6.0
	6-36	---	3.4-8.2	3.6-6.0
	36-45	---	1.5-4.6	3.6-6.0
	45-80	---	---	---
JbE:				
Junaluska	0-2	---	4.3-14	3.6-5.5
	2-11	---	4.3-14	3.6-5.5
	11-21	---	3.4-8.2	3.6-6.0
	21-26	---	2.8-5.3	3.6-6.0
	26-80	---	---	---
Brasstown	0-6	---	4.3-14	3.6-6.0
	6-36	---	3.4-8.2	3.6-6.0
	36-45	---	1.5-4.6	3.6-6.0
	45-80	---	---	---

Table 18.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	Inches	meq/100 g	meq/100 g	pH
JnD. Junaluska-Brasstown-Urban land				
JtD:				
Junaluska	0-5	---	4.3-14	3.6-6.0
	5-21	---	3.4-8.2	3.6-6.0
	21-36	---	2.8-5.3	3.6-6.0
	36-80	---	---	---
Tsali	0-8	---	4.3-14	3.6-6.0
	8-13	---	3.4-7.4	3.6-6.0
	13-18	---	3.4-7.4	3.6-6.0
	18-80	---	---	---
JtE:				
Junaluska	0-5	---	4.3-14	3.6-6.0
	5-21	---	3.4-8.2	3.6-6.0
	21-36	---	2.8-5.3	3.6-6.0
	36-80	---	---	---
Tsali	0-8	---	4.3-14	3.6-6.0
	8-13	---	3.4-7.4	3.6-6.0
	13-18	---	3.4-7.4	3.6-6.0
	18-80	---	---	---
JtF:				
Junaluska	0-5	---	4.3-14	3.6-6.0
	5-21	---	3.4-8.2	3.6-6.0
	21-36	---	2.8-5.3	3.6-6.0
	36-80	---	---	---
Tsali	0-8	---	4.3-14	3.6-6.0
	8-13	---	3.4-7.4	3.6-6.0
	13-18	---	3.4-7.4	3.6-6.0
	18-80	---	---	---
LnC:				
Lonon, bouldery	0-7	---	11-21	3.6-6.0
	7-30	---	3.4-7.4	3.6-6.0
	30-40	---	3.4-7.4	3.6-6.0
	40-80	---	3.4-7.4	3.6-6.0
Northcove, bouldery	0-7	---	11-20	3.6-6.0
	7-30	---	0.9-5.1	3.6-6.0
	30-80	---	0.2-4.2	3.6-6.0
LnD:				
Lonon, bouldery	0-7	---	11-21	3.6-6.0
	7-30	---	3.4-7.4	3.6-6.0
	30-40	---	3.4-7.4	3.6-6.0
	40-80	---	3.4-7.4	3.6-6.0
Northcove, bouldery	0-7	---	11-20	3.6-6.0
	7-30	---	0.9-5.1	3.6-6.0
	30-80	---	0.2-4.2	3.6-6.0

Table 18.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	Inches	meq/100 g	meq/100 g	pH
LtD:				
Luftee, very rocky, windswept	0-11	---	19-39	3.5-5.0
	11-34	---	6.4-18	3.5-5.0
	34-80	---	---	---
Anakeesta, very rocky, windswept	0-14	---	19-39	3.5-5.5
	14-45	---	6.4-18	3.5-5.5
	45-80	---	---	---
LtE:				
Luftee, very rocky, windswept	0-11	---	19-39	3.5-5.0
	11-34	---	6.4-18	3.5-5.0
	34-80	---	---	---
Anakeesta, very rocky, windswept	0-14	---	19-39	3.5-5.5
	14-45	---	6.4-18	3.5-5.5
	45-80	---	---	---
LtF:				
Luftee, very rocky, windswept	0-11	---	19-39	3.5-5.0
	11-34	---	6.4-18	3.5-5.0
	34-80	---	---	---
Anakeesta, very rocky, windswept	0-14	---	19-39	3.5-5.5
	14-45	---	6.4-18	3.5-5.5
	45-80	---	---	---
NtE:				
Northcove, very bouldery	0-7	---	11-20	3.6-6.0
	7-30	---	0.9-5.1	3.6-6.0
	30-80	---	0.2-4.2	3.6-6.0
Lonon, very bouldery	0-7	---	11-21	3.6-6.0
	7-30	---	3.4-7.4	3.6-6.0
	30-40	---	3.4-7.4	3.6-6.0
	40-80	---	3.4-7.4	3.6-6.0
RdA:				
Reddies, occasionally flooded	0-14	15-27	---	4.5-7.3
	14-26	4.6-15	---	4.5-7.3
	26-80	0.2-2.4	---	4.5-7.3
SbE:				
Snowbird, stony	0-7	---	9.4-29	3.6-5.5
	7-33	---	3.4-8.2	3.6-5.5
	33-52	---	0.9-4.2	3.6-5.5
	52-80	---	---	---

Table 18.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	Inches	meq/100 g	meq/100 g	pH
SbF:				
Snowbird, stony	0-7	---	9.4-29	3.6-5.5
	7-33	---	3.4-8.2	3.6-5.5
	33-52	---	0.9-4.2	3.6-5.5
	52-80	---	---	---
ScD:				
Soco, stony	0-5	---	4.3-14	3.6-5.5
	5-24	---	0.9-5.8	3.6-5.5
	24-35	---	0.9-5.1	3.6-5.5
	35-80	---	---	---
Stecoah, stony	0-5	---	4.3-14	3.6-5.5
	5-22	---	0.9-5.8	3.6-5.5
	22-45	---	0.9-4.2	3.6-5.5
	45-80	---	---	---
ScE:				
Soco, stony	0-5	---	4.3-14	3.6-5.5
	5-24	---	0.9-5.8	3.6-5.5
	24-35	---	0.9-5.1	3.6-5.5
	35-80	---	---	---
Stecoah, stony	0-5	---	4.3-14	3.6-5.5
	5-22	---	0.9-5.8	3.6-5.5
	22-45	---	0.9-4.2	3.6-5.5
	45-80	---	---	---
ScF:				
Soco, stony	0-5	---	4.3-14	3.6-5.5
	5-24	---	0.9-5.8	3.6-5.5
	24-35	---	0.9-5.1	3.6-5.5
	35-80	---	---	---
Stecoah, stony	0-5	---	4.3-14	3.6-5.5
	5-22	---	0.9-5.8	3.6-5.5
	22-45	---	0.9-4.2	3.6-5.5
	45-80	---	---	---
SdD:				
Soco, rocky	0-5	---	4.3-14	3.6-5.5
	5-24	---	0.9-5.8	3.6-5.5
	24-35	---	0.9-5.1	3.6-5.5
	35-80	---	---	---
Stecoah, rocky	0-5	---	4.3-14	3.6-5.5
	5-22	---	0.9-5.8	3.6-5.5
	22-45	---	0.9-4.2	3.6-5.5
	45-80	---	---	---
SdE:				
Soco, rocky	0-5	---	4.3-14	3.6-5.5
	5-24	---	0.9-5.8	3.6-5.5
	24-35	---	0.9-5.1	3.6-5.5
	35-80	---	---	---
Stecoah, rocky	0-5	---	4.3-14	3.6-5.5
	5-22	---	0.9-5.8	3.6-5.5
	22-45	---	0.9-4.2	3.6-5.5
	45-80	---	---	---

Table 18.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	Inches	meq/100 g	meq/100 g	pH
SdF:				
Soco, rocky	0-5	---	4.3-14	3.6-5.5
	5-24	---	0.9-5.8	3.6-5.5
	24-35	---	0.9-5.1	3.6-5.5
	35-80	---	---	---
Stecoah, rocky	0-5	---	4.3-14	3.6-5.5
	5-22	---	0.9-5.8	3.6-5.5
	22-45	---	0.9-4.2	3.6-5.5
	45-80	---	---	---
SnD:				
Soco, stony, windswept	0-3	---	4.3-14	3.6-5.5
	3-23	---	0.9-5.8	3.6-5.5
	23-80	---	---	---
Stecoah, stony, windswept	0-5	---	4.3-14	3.6-5.5
	5-22	---	0.9-5.8	3.6-5.5
	22-45	---	0.9-4.2	3.6-5.5
	45-80	---	---	---
SnE:				
Soco, stony, windswept	0-3	---	4.3-14	3.6-5.5
	3-23	---	0.9-5.8	3.6-5.5
	23-80	---	---	---
Stecoah, stony, windswept	0-5	---	4.3-14	3.6-5.5
	5-22	---	0.9-5.8	3.6-5.5
	22-45	---	0.9-4.2	3.6-5.5
	45-80	---	---	---
SpE:				
Spivey, very bouldery	0-12	---	14-29	3.6-6.0
	12-80	---	2.6-12	3.6-6.0
Santeetlah, very bouldery	0-17	---	11-30	4.5-6.0
	17-39	---	4.2-7.1	4.5-6.0
	39-49	---	2.2-6.1	4.5-6.0
	49-80	---	1.3-5.2	4.5-6.0
SpF:				
Spivey, very bouldery	0-12	---	14-29	3.6-6.0
	12-80	---	2.6-12	3.6-6.0
Santeetlah, very bouldery	0-17	---	11-30	4.5-6.0
	17-39	---	4.2-7.1	4.5-6.0
	39-49	---	2.2-6.1	4.5-6.0
	49-80	---	1.3-5.2	4.5-6.0

Table 18.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	Inches	meq/100 g	meq/100 g	pH
SvC:				
Spivey, bouldery	0-12	---	14-29	3.6-6.0
	12-80	---	2.6-12	3.6-6.0
Whiteoak, bouldery	0-9	---	11-30	4.5-6.0
	9-46	---	4.2-7.1	4.5-5.5
	46-80	---	1.3-5.9	4.5-5.5
SvD:				
Spivey, bouldery	0-12	---	14-29	3.6-6.0
	12-80	---	2.6-12	3.6-6.0
Whiteoak, bouldery	0-9	---	11-30	4.5-6.0
	9-46	---	4.2-7.1	4.5-5.5
	46-80	---	1.3-5.9	4.5-5.5
SwB:				
Statler, rarely flooded	0-8	17-23	---	5.1-7.3
	8-36	8.1-11	---	5.1-6.5
	36-50	6.1-9.8	---	5.1-6.0
	50-80	5.8-8.6	---	5.1-6.0
SyD:				
Sylco, very rocky	0-4	---	6.2-15	3.6-5.5
	4-22	---	3.7-6.4	3.6-5.5
	22-80	---	---	---
Cataska, very rocky	0-4	---	5.6-13	3.6-5.5
	4-16	---	2.2-5.8	3.6-5.5
	16-28	---	---	---
	28-80	---	---	---
SyE:				
Sylco, very rocky	0-4	---	6.2-15	3.6-5.5
	4-22	---	3.7-6.4	3.6-5.5
	22-80	---	---	---
Cataska, very rocky	0-4	---	5.6-13	3.6-5.5
	4-16	---	2.2-5.8	3.6-5.5
	16-28	---	---	---
	28-80	---	---	---
SyF:				
Sylco, very rocky	0-4	---	6.2-15	3.6-5.5
	4-22	---	3.7-6.4	3.6-5.5
	22-80	---	---	---
Cataska, very rocky	0-4	---	5.6-14	3.6-5.5
	4-16	---	2.2-5.8	3.6-5.5
	16-28	---	---	---
	28-80	---	---	---
ThB:				
Thurmont	0-4	---	6.9-18	4.5-5.5
	4-35	---	4.2-8.2	4.5-5.5
	35-42	---	4.2-8.2	4.5-5.5
	42-48	---	0.9-4.2	4.5-5.5
	48-80	---	1.9-9.5	4.5-5.5

Table 18.—Chemical Soil Properties—Continued

Map symbol and soil name	Depth	Cation-exchange capacity	Effective cation-exchange capacity	Soil reaction
	Inches	meq/100 g	meq/100 g	pH
ThB:				
Dillard	0-7	7.0-19	---	5.1-6.0
	7-50	---	4.2-8.2	4.5-5.5
	50-80	---	0.9-5.7	4.5-5.8
UdD:				
Udorthents	0-80	---	0.9-4.2	3.6-5.5
Urban land.				
UdE:				
Udorthents	0-80	---	0.9-4.2	3.6-5.5
Urban land.				
UnB:				
Unison	0-10	7.0-20	---	4.5-6.5
	10-49	---	5.6-14	4.5-6.0
	49-80	---	4.1-7.4	4.5-6.0
UnC:				
Unison	0-10	7.0-20	---	4.5-6.5
	10-49	---	5.6-14	4.5-6.0
	49-80	---	4.1-7.4	4.5-6.0
UoA:				
Udorthents, rarely flooded	0-80	---	0.9-4.2	3.6-5.5
Urban land, rarely flooded.				
W.				
Water				

Table 19.—Water Features

(Depths of layers are in feet. See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft		Ft				
AkB:									
Alarka, occasionally flooded	C/D								
		Jan-May	0	Apparent	---	---	---	---	Rare
		Jun-Nov	0.5-1.5	Apparent	---	---	---	---	Rare
		Dec	0	Apparent	---	---	---	---	Rare
Wesser, occasionally flooded	B/D								
		Jan-May	0	Apparent	0.0-0.5	Brief	Occasional	Very brief	Occasional
		Jun-Nov	0.5-1.5	Apparent	0.0-0.5	Brief	Occasional	Very brief	Occasional
		Dec	0	Apparent	0.0-0.5	Brief	Occasional	Very brief	Occasional
BkB2:									
Braddock, moderately eroded	B								
		Jan-Dec	---	---	---	---	---	---	None
BkC2:									
Braddock, moderately eroded	B								
		Jan-Dec	---	---	---	---	---	---	None
BkD2:									
Braddock, moderately eroded	B								
		Jan-Dec	---	---	---	---	---	---	None
BnC:									
Braddock	B								
		Jan-Dec	---	---	---	---	---	---	None
Urban land.									
BuC:									
Breakneck, very rocky, windswept	B								
		Jan-Dec	---	---	---	---	---	---	None
Pullback, very rocky, windswept	D								
		Jan-Dec	---	---	---	---	---	---	None
BuD:									
Breakneck, very rocky, windswept	B								
		Jan-Dec	---	---	---	---	---	---	None

Table 19.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft		Ft				
BuD:									
Pullback, very rocky, windswept------	D								
		Jan-Dec	---	---	---	---	---	---	None
BuE:									
Breakneck, very rocky, windswept------	B								
		Jan-Dec	---	---	---	---	---	---	None
Pullback, very rocky, windswept------	D								
		Jan-Dec	---	---	---	---	---	---	None
BuF:									
Breakneck, very rocky, windswept------	B								
		Jan-Dec	---	---	---	---	---	---	None
Pullback, very rocky, windswept------	D								
		Jan-Dec	---	---	---	---	---	---	None
ChE:									
Cheoah, stony---	A								
		Jan-Dec	---	---	---	---	---	---	None
ChF:									
Cheoah, stony---	A								
		Jan-Dec	---	---	---	---	---	---	None
CrD:									
Cheoah, rocky---	A								
		Jan-Dec	---	---	---	---	---	---	None
Jeffrey, rocky--	B								
		Jan-Dec	---	---	---	---	---	---	None
CrE:									
Cheoah, rocky---	A								
		Jan-Dec	---	---	---	---	---	---	None
Jeffrey, rocky--	B								
		Jan-Dec	---	---	---	---	---	---	None
CsF:									
Cheoah, very rocky----------	A								
		Jan-Dec	---	---	---	---	---	---	None
Jeffrey, very rocky----------	B								
		Jan-Dec	---	---	---	---	---	---	None

Table 19.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft		Ft				
CwA:									
Cullowhee, occasionally flooded	A/D								
		Jan-May	1.5-2.0	Apparent	---	---	---	Very brief	Occasional
		Jun-Nov	2.0-2.5	Apparent	---	---	---	Very brief	Occasional
		Dec	1.5-2.0	Apparent	---	---	---	Very brief	Occasional
Ela, occasionally flooded	A/D								
		Jan-May	0	Apparent	0.0-0.5	Brief	Occasional	Very brief	Occasional
		Jun-Nov	0.5-1.5	Apparent	0.0-0.5	Brief	Occasional	Very brief	Occasional
		Dec	0	Apparent	0.0-0.5	Brief	Occasional	Very brief	Occasional
DAM.									
Dam									
DeB:									
Dellwood, occasionally flooded	B								
		Jan-May	2.0-4.0	Apparent	---	---	---	Very brief	Occasional
		Jun-Nov	2.5-4.5	Apparent	---	---	---	Very brief	Occasional
		Dec	2.0-4.0	Apparent	---	---	---	Very brief	Occasional
Reddies, occasionally flooded	B								
		Jan-May	2.0-3.5	Apparent	---	---	---	Very brief	Occasional
		Jun-Nov	2.5-4.0	Apparent	---	---	---	Very brief	Occasional
		Dec	2.0-3.5	Apparent	---	---	---	Very brief	Occasional
DrB:									
Dillard, rarely flooded	C								
		Jan-May	2.0-3.0	Apparent	---	---	---	---	Rare
		Jun-Nov	2.5-3.5	Apparent	---	---	---	---	Rare
		Dec	2.0-3.0	Apparent	---	---	---	---	Rare
DtD:									
Ditney, very stony	B								
		Jan-Dec	---	---	---	---	---	---	None
Unicoi, very stony	D								
		Jan-Dec	---	---	---	---	---	---	None
Rock outcrop.									
DtE:									
Ditney, very stony	B								
		Jan-Dec	---	---	---	---	---	---	None
Unicoi, very stony	D								
		Jan-Dec	---	---	---	---	---	---	None
Rock outcrop.									

Table 19.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft		Ft				
DtF:									
Ditney, very stony	B								
		Jan-Dec	---	---	---	---	---	---	None
Unicoi, very stony	D								
		Jan-Dec	---	---	---	---	---	---	None
Rock outcrop.									
EtA:									
Ela, occasionally flooded	A/D								
		Jan-May	0	Apparent	0.0-0.5	Brief	Occasional	Very brief	Occasional
		Jun-Nov	0.5-1.5	Apparent	0.0-0.5	Brief	Occasional	Very brief	Occasional
		Dec	0	Apparent	0.0-0.5	Brief	Occasional	Very brief	Occasional
Ela, undrained	A/D								
		Jan-May	0	Apparent	0.0-0.5	Brief	Occasional	Very brief	Occasional
		Jun-Nov	0.5-1.5	Apparent	0.0-0.5	Brief	Occasional	Very brief	Occasional
		Dec	0	Apparent	0.0-0.5	Brief	Occasional	Very brief	Occasional
FvA:									
Fluvaquents, ponded	C/D								
		Jan-May	0.0-1.0	Apparent	0.0-0.5	Long	Frequent	Very brief	Frequent
		Jun-Nov	0.5-1.5	Apparent	0.0-0.5	Long	Frequent	Very brief	Frequent
		Dec	0.0-1.0	Apparent	0.0-0.5	Long	Frequent	Very brief	Frequent
HcD:									
Heintooga, bouldery	A								
		Jan-Dec	---	---	---	---	---	---	None
Chiltoskie, bouldery	A								
		Jan-Dec	---	---	---	---	---	---	None
HdE:									
Heintooga, very bouldery	A								
		Jan-Dec	---	---	---	---	---	---	None
Chiltoskie, very bouldery	A								
		Jan-Dec	---	---	---	---	---	---	None
HmA:									
Hemphill, rarely flooded	C/D								
		Jan-May	0	Apparent	0.0-0.5	Brief	Occasional	---	Rare
		Jun-Nov	0.5-1.5	Apparent	0.0-0.5	Brief	Occasional	---	Rare
		Dec	0	Apparent	0.0-0.5	Brief	Occasional	---	Rare
Hemphill, undrained	C/D								
		Jan-May	0	Apparent	0.0-0.5	Brief	Occasional	---	Rare
		Jun-Nov	0.5-1.5	Apparent	0.0-0.5	Brief	Occasional	---	Rare
		Dec	0	Apparent	0.0-0.5	Brief	Occasional	---	Rare

Table 19.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft		Ft				
JbC:									
Junaluska	C	Jan-Dec	---	---	---	---	---	---	None
Brasstown	B	Jan-Dec	---	---	---	---	---	---	None
JbD:									
Junaluska	C	Jan-Dec	---	---	---	---	---	---	None
Brasstown	B	Jan-Dec	---	---	---	---	---	---	None
JbE:									
Junaluska	C	Jan-Dec	---	---	---	---	---	---	None
Brasstown	B	Jan-Dec	---	---	---	---	---	---	None
JnD:									
Junaluska	C	---	---	---	---	---	---	---	---
Brasstown	B	---	---	---	---	---	---	---	---
Urban land.									
JtD:									
Junaluska	C	Jan-Dec	---	---	---	---	---	---	None
Tsali	D	Jan-Dec	---	---	---	---	---	---	None
JtE:									
Junaluska	C	Jan-Dec	---	---	---	---	---	---	None
Tsali	D	Jan-Dec	---	---	---	---	---	---	None
JtF:									
Junaluska	C	Jan-Dec	---	---	---	---	---	---	None
Tsali	D	Jan-Dec	---	---	---	---	---	---	None
LnC:									
Lonon, bouldery	B	Jan-Dec	---	---	---	---	---	---	None
Northcove, bouldery	A	Jan-Dec	---	---	---	---	---	---	None

Table 19.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft		Ft				
LnD:									
Lonon, bouldery	B								
		Jan-Dec	---	---	---	---	---	---	None
Northcove, bouldery	A								
		Jan-Dec	---	---	---	---	---	---	None
LtD:									
Luftee, very rocky, windswept	B								
		Jan-Dec	---	---	---	---	---	---	None
Anakeesta, very rocky, windswept	A								
		Jan-Dec	---	---	---	---	---	---	None
LtE:									
Luftee, very rocky, windswept	B								
		Jan-Dec	---	---	---	---	---	---	None
Anakeesta, very rocky, windswept	A								
		Jan-Dec	---	---	---	---	---	---	None
LtF:									
Luftee, very rocky, windswept	B								
		Jan-Dec	---	---	---	---	---	---	None
Anakeesta, very rocky, windswept	A								
		Jan-Dec	---	---	---	---	---	---	None
NtE:									
Northcove, very bouldery	A								
		Jan-Dec	---	---	---	---	---	---	None
Lonon, very bouldery	B								
		Jan-Dec	---	---	---	---	---	---	None
RdA:									
Reddies, occasionally flooded	B								
		Jan-May	2.0-3.5	Apparent	---	---	---	Very brief	Occasional
		Jun-Nov	2.5-4.0	Apparent	---	---	---	Very brief	Occasional
		Dec	2.0-3.5	Apparent	---	---	---	Very brief	Occasional

Table 19.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft		Ft				
SbE:									
Snowbird, stony	B								
		Jan-Dec	---	---	---	---	---	---	None
SbF:									
Snowbird, stony	B								
		Jan-Dec	---	---	---	---	---	---	None
ScD:									
Soco, stony	B								
		Jan-Dec	---	---	---	---	---	---	None
Stecoah, stony	A								
		Jan-Dec	---	---	---	---	---	---	None
ScE:									
Soco, stony	B								
		Jan-Dec	---	---	---	---	---	---	None
Stecoah, stony	A								
		Jan-Dec	---	---	---	---	---	---	None
ScF:									
Soco, stony	B								
		Jan-Dec	---	---	---	---	---	---	None
Stecoah, stony	A								
		Jan-Dec	---	---	---	---	---	---	None
SdD:									
Soco, rocky	B								
		Jan-Dec	---	---	---	---	---	---	None
Stecoah, rocky	A								
		Jan-Dec	---	---	---	---	---	---	None
SdE:									
Soco, rocky	B								
		Jan-Dec	---	---	---	---	---	---	None
Stecoah, rocky	A								
		Jan-Dec	---	---	---	---	---	---	None
SdF:									
Soco, rocky	B								
		Jan-Dec	---	---	---	---	---	---	None
Stecoah, rocky	A								
		Jan-Dec	---	---	---	---	---	---	None
SnD:									
Soco, stony, windswept	B								
		Jan-Dec	---	---	---	---	---	---	None
Stecoah, stony, windswept	A								
		Jan-Dec	---	---	---	---	---	---	None

Table 19.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft		Ft				
SnE:									
Soco, stony, windswept------	B								
		Jan-Dec	---	---	---	---	---	---	None
Stecoah, stony, windswept------	A								
		Jan-Dec	---	---	---	---	---	---	None
SpE:									
Spivey, very bouldery-------	A								
		Jan-Dec	---	---	---	---	---	---	None
Santeetlah, very bouldery--	B								
		Jan-Dec	---	---	---	---	---	---	None
SpF:									
Spivey, very bouldery-------	A								
		Jan-Dec	---	---	---	---	---	---	None
Santeetlah, very bouldery--	B								
		Jan-Dec	---	---	---	---	---	---	None
SvC:									
Spivey, bouldery	A								
		Jan-Dec	---	---	---	---	---	---	None
Whiteoak, bouldery-------	B								
		Jan-Dec	---	---	---	---	---	---	None
SvD:									
Spivey, bouldery	A								
		Jan-Dec	---	---	---	---	---	---	None
Whiteoak, bouldery-------	B								
		Jan-Dec	---	---	---	---	---	---	None
SwB:									
Statler, rarely flooded--------	B								
		Jan-Dec	4.0-6.0	Apparent	---	---	---	---	Rare
SyD:									
Sylco, very rocky----------	B								
		Jan-Dec	---	---	---	---	---	---	None
Cataska, very rocky----------	D								
		Jan-Dec	---	---	---	---	---	---	None

Table 19.—Water Features—Continued

Map symbol and soil name	Hydro-logic group	Months	Water table: Upper limit	Water table: Kind	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft		Ft				
SyE:									
Sylco, very rocky	B								
		Jan-Dec	---	---	---	---	---	---	None
Cataska, very rocky	D								
		Jan-Dec	---	---	---	---	---	---	None
SyF:									
Sylco, very rocky	B								
		Jan-Dec	---	---	---	---	---	---	None
Cataska, very rocky	D								
		Jan-Dec	---	---	---	---	---	---	None
ThB:									
Thurmont	B								
		Jan-May	3.0-6.0	Apparent	---	---	---	---	None
		Jun-Nov	3.5-6.0	Apparent	---	---	---	---	None
		Dec	3.0-6.0	Apparent	---	---	---	---	None
Dillard	C								
		Jan-May	2.0-3.0	Apparent	---	---	---	---	None
		Jun-Nov	2.5-3.5	Apparent	---	---	---	---	None
		Dec	2.0-3.0	Apparent	---	---	---	---	None
UdD:									
Udorthents	A								
		Jan-Dec	---	---	---	---	---	---	None
Urban land.									
UdE:									
Udorthents	A								
		Jan-Dec	---	---	---	---	---	---	None
Urban land.									
UnB:									
Unison	B								
		Jan-Dec	---	---	---	---	---	---	None
UnC:									
Unison	B								
		Jan-Dec	---	---	---	---	---	---	None
UoA:									
Udorthents, rarely flooded	A								
		Jan-Dec	---	---	---	---	---	---	Rare
Urban land, rarely flooded.									

Table 20.—Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Restrictive layer			Soil slippage potential	Risk of corrosion	
	Kind	Depth to top	Hardness		Uncoated steel	Concrete
		In				
AkB:						
Alarka, occasionally flooded	Abrupt textural change	20-40	Noncemented	---	High	High
Wesser, occasionally flooded	Abrupt textural change	11-20	Noncemented	---	Moderate	High
BkB2:						
Braddock, moderately eroded	---	---	---	---	High	High
BkC2:						
Braddock, moderately eroded	---	---	---	---	High	High
BkD2:						
Braddock, moderately eroded	---	---	---	---	High	High
BnC:						
Braddock	---	---	---	---	High	High
Urban land.						
BuC:						
Breakneck, very rocky, windswept	Lithic bedrock	20-40	Very strongly cemented	---	High	High
Pullback, very rocky, windswept	Lithic bedrock	10-20	Very strongly cemented	---	High	High
BuD:						
Breakneck, very rocky, windswept	Lithic bedrock	20-40	Very strongly cemented	Low	High	High
Pullback, very rocky, windswept	Lithic bedrock	10-20	Very strongly cemented	Low	High	High
BuE:						
Breakneck, very rocky, windswept	Lithic bedrock	20-40	Very strongly cemented	Medium	High	High
Pullback, very rocky, windswept	Lithic bedrock	10-20	Very strongly cemented	Medium	High	High

Table 20.—Soil Features—Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Hardness	Soil slippage potential	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In				
BuF:						
Breakneck, very rocky, windswept	Lithic bedrock	20-40	Very strongly cemented	Medium	High	High
Pullback, very rocky, windswept	Lithic bedrock	10-20	Very strongly cemented	High	High	High
ChE:						
Cheoah, stony	Paralithic bedrock	40-60	Moderately cemented	Low	Low	High
ChF:						
Cheoah, stony	Paralithic bedrock	40-60	Moderately cemented	Medium	High	High
CrD:						
Cheoah, rocky	Paralithic bedrock	40-60	Moderately cemented	---	High	High
Jeffrey, rocky	Lithic bedrock	20-40	Very strongly cemented	Low	Moderate	Moderate
CrE:						
Cheoah, rocky	Paralithic bedrock	40-60	Moderately cemented	Low	High	High
Jeffrey, rocky	Lithic bedrock	20-40	Very strongly cemented	Medium	Moderate	Moderate
CsF:						
Cheoah, very rocky	Paralithic bedrock	40-60	Moderately cemented	Medium	Low	High
Jeffrey, very rocky	Lithic bedrock	20-40	Very strongly cemented	Medium	Low	High
CwA:						
Cullowhee, occasionally flooded	Strongly contrasting textural stratification	20-40	Noncemented	---	High	Moderate
Ela, occasionally flooded	Abrupt textural change	20-40	Noncemented	---	Moderate	Moderate
DAM.						
Dam						

Table 20.—Soil Features—Continued

Map symbol and soil name	Restrictive layer			Soil slippage potential	Risk of corrosion	
	Kind	Depth to top	Hardness		Uncoated steel	Concrete
		In				
DeB:						
Dellwood, occasionally flooded	---	---	---	---	Moderate	Moderate
Reddies, occasionally flooded	Strongly contrasting textural stratification	20-40	Noncemented	---	High	Moderate
DrB:						
Dillard, rarely flooded	---	---	---	---	High	Moderate
DtD:						
Ditney, very stony	Lithic bedrock	20-40	Indurated	Low	Moderate	High
Unicoi, very stony	Lithic bedrock	7-20	Indurated	Low	Moderate	High
Rock outcrop.						
DtE:						
Ditney, very stony	Lithic bedrock	20-40	Indurated	Medium	Moderate	High
Unicoi, very stony	Lithic bedrock	7-20	Indurated	Medium	Moderate	High
Rock outcrop.						
DtF:						
Ditney, very stony	Lithic bedrock	20-40	Indurated	Medium	Moderate	High
Unicoi, very stony	Lithic bedrock	7-20	Indurated	High	Moderate	High
Rock outcrop.						
EtA:						
Ela, occasionally flooded	Abrupt textural change	20-40	Noncemented	---	Moderate	Moderate
Ela, undrained	Abrupt textural change	20-40	Noncemented	---	Moderate	Moderate
FvA:						
Fluvaquents, ponded	---	---	---	---	Moderate	Moderate
HcD:						
Heintooga, bouldery	---	---	---	Low	High	High
Chiltoskie, bouldery	---	---	---	---	High	High

Table 20.—Soil Features—Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Restrictive layer: Hardness	Soil slippage potential	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In				
HdE:						
Heintooga, very bouldery	---	---	---	Medium	High	High
Chiltoskie, very bouldery	---	---	---	Low	High	High
HmA:						
Hemphill, rarely flooded	---	---	---	---	Moderate	Moderate
Hemphill, undrained	---	---	---	---	Moderate	Moderate
JbC:						
Junaluska	Paralithic bedrock	20-40	Moderately cemented	---	Moderate	High
Brasstown	Paralithic bedrock	40-60	Moderately cemented	---	Moderate	High
JbD:						
Junaluska	Paralithic bedrock	20-40	Moderately cemented	---	Moderate	High
Brasstown	Paralithic bedrock	40-60	Moderately cemented	---	Moderate	High
JbE:						
Junaluska	Paralithic bedrock	20-40	Moderately cemented	Low	Moderate	High
Brasstown	Paralithic bedrock	40-60	Moderately cemented	Low	Moderate	High
JnD:						
Junaluska	---	---	---	---	Moderate	High
Brasstown	---	---	---	---	Moderate	High
Urban land.						
JtD:						
Junaluska	Paralithic bedrock	20-40	Moderately cemented	---	High	High
Tsali	Paralithic bedrock	10-20	Moderately cemented	Low	Low	High

Table 20.—Soil Features—Continued

Map symbol and soil name	Restrictive layer			Soil slippage potential	Risk of corrosion	
	Kind	Depth to top	Hardness		Uncoated steel	Concrete
		In				
JtE:						
Junaluska	Paralithic bedrock	20-40	Moderately cemented	Medium	High	High
Tsali	Paralithic bedrock	10-20	Moderately cemented	Medium	Low	High
JtF:						
Junaluska	Paralithic bedrock	20-40	Moderately cemented	Medium	High	High
Tsali	Paralithic bedrock	10-20	Moderately cemented	High	Low	High
LnC:						
Lonon, bouldery	---	---	---	---	Moderate	High
Northcove, bouldery	---	---	---	---	Moderate	High
LnD:						
Lonon, bouldery	---	---	---	---	Moderate	High
Northcove, bouldery	---	---	---	Low	Moderate	High
LtD:						
Luftee, very rocky, windswept	Lithic bedrock	20-40	Very strongly cemented	Low	High	High
Anakeesta, very rocky, windswept	Lithic bedrock	40-60	Very strongly cemented	Low	High	High
LtE:						
Luftee, very rocky, windswept	Lithic bedrock	20-40	Very strongly cemented	Medium	High	High
Anakeesta, very rocky, windswept	Lithic bedrock	40-60	Very strongly cemented	Medium	High	High
LtF:						
Luftee, very rocky, windswept	Lithic bedrock	20-40	Very strongly cemented	High	High	High
Anakeesta, very rocky, windswept	Lithic bedrock	40-60	Very strongly cemented	High	High	High

Table 20.—Soil Features—Continued

Map symbol and soil name	Restrictive layer			Soil slippage potential	Risk of corrosion	
	Kind	Depth to top	Hardness		Uncoated steel	Concrete
		In				
NtE:						
Northcove, very bouldery	---	---	---	Medium	Moderate	High
Lonon, very bouldery	---	---	---	Low	Moderate	High
RdA:						
Reddies, occasionally flooded	Strongly contrasting textural stratification	20-40	Noncemented	---	High	Moderate
SbE:						
Snowbird, stony	Paralithic bedrock	40-60	Moderately cemented	Low	Moderate	High
SbF:						
Snowbird, stony	Paralithic bedrock	40-60	Moderately cemented	Medium	Moderate	High
ScD:						
Soco, stony	Paralithic bedrock	20-40	Moderately cemented	---	Moderate	High
Stecoah, stony	Paralithic bedrock	40-60	Moderately cemented	---	Moderate	High
ScE:						
Soco, stony	Paralithic bedrock	20-40	Moderately cemented	Low	Moderate	High
Stecoah, stony	Paralithic bedrock	40-60	Moderately cemented	Low	Moderate	High
ScF:						
Soco, stony	Paralithic bedrock	20-40	Moderately cemented	Medium	Moderate	High
Stecoah, stony	Paralithic bedrock	40-60	Moderately cemented	Medium	Moderate	High
SdD:						
Soco, rocky	Paralithic bedrock	20-40	Moderately cemented	---	Moderate	High
Stecoah, rocky	Paralithic bedrock	40-60	Moderately cemented	---	Moderate	High

Table 20.—Soil Features—Continued

Map symbol and soil name	Restrictive layer			Soil slippage potential	Risk of corrosion	
	Kind	Depth to top	Hardness		Uncoated steel	Concrete
		In				
SdE:						
Soco, rocky	Paralithic bedrock	20-40	Moderately cemented	Low	Moderate	High
Stecoah, rocky	Paralithic bedrock	40-60	Moderately cemented	Low	Moderate	High
SdF:						
Soco, rocky	Paralithic bedrock	20-40	Moderately cemented	Medium	Moderate	High
Stecoah, rocky	Paralithic bedrock	40-60	Moderately cemented	Medium	Moderate	High
SnD:						
Soco, stony, windswept	Paralithic bedrock	20-40	Moderately cemented	---	Moderate	High
Stecoah, stony, windswept	Paralithic bedrock	40-60	Moderately cemented	---	Moderate	High
SnE:						
Soco, stony, windswept	Paralithic bedrock	20-40	Moderately cemented	Low	Moderate	High
Stecoah, stony, windswept	Paralithic bedrock	40-60	Moderately cemented	Low	Moderate	High
SpE:						
Spivey, very bouldery	---	---	---	Medium	High	High
Santeetlah, very bouldery	---	---	---	Low	High	Moderate
SpF:						
Spivey, very bouldery	---	---	---	High	High	High
Santeetlah, very bouldery	---	---	---	Medium	High	Moderate
SvC:						
Spivey, bouldery	---	---	---	---	High	High
Whiteoak, bouldery	---	---	---	---	Moderate	Moderate
SvD:						
Spivey, bouldery	---	---	---	Low	High	High
Whiteoak, bouldery	---	---	---	---	Moderate	Moderate

Table 20.—Soil Features—Continued

Map symbol and soil name	Restrictive layer			Soil slippage potential	Risk of corrosion	
	Kind	Depth to top	Hardness		Uncoated steel	Concrete
		In				
SwB:						
Statler, rarely flooded	---	---	---	---	Moderate	Moderate
SyD:						
Sylco, very rocky	Lithic bedrock	20-40	Very strongly cemented	Low	Moderate	High
Cataska, very rocky	Paralithic bedrock	10-20	Moderately cemented	Low	Moderate	High
	Lithic bedrock	20-40	Very strongly cemented			
SyE:						
Sylco, very rocky	Lithic bedrock	20-40	Very strongly cemented	Medium	Moderate	High
Cataska, very rocky	Paralithic bedrock	10-20	Moderately cemented	Medium	Moderate	High
	Lithic bedrock	20-40	Very strongly cemented			
SyF:						
Sylco, very rocky	Lithic bedrock	20-60	Very strongly cemented	High	Moderate	High
Cataska, very rocky	Paralithic bedrock	10-20	Moderately cemented	High	Moderate	High
	Lithic bedrock	20-60	Very strongly cemented			
ThB:						
Thurmont	---	---	---	---	High	Moderate
Dillard	---	---	---	---	High	Moderate
UdD:						
Udorthents	---	---	---	---	Low	Low
Urban land.						
UdE:						
Udorthents	---	---	---	High	Low	Low
Urban land.						
UnB:						
Unison	---	---	---	---	High	Moderate

Table 20.—Soil Features—Continued

Map symbol and soil name	Restrictive layer			Soil slippage potential	Risk of corrosion	
	Kind	Depth to top	Hardness		Uncoated steel	Concrete
		In				
UnC:						
Unison	---	---	---	---	High	Moderate
UoA.						
Udorthents, rarely flooded	---	---	---	---	Low	Low
Urban land, rarely flooded.						
W.						
Water						

Table 21.—Taxonomic Classification of the Soils

Soil name	Family or higher taxonomic class
Alarka	Fine-loamy over sandy or sandy-skeletal, mixed, active, mesic Aeric Epiaquults
Anakeesta	Loamy-skeletal, isotic, frigid Humic Dystrudepts
Braddock	Fine, mixed, semiactive, mesic Typic Hapludults
Brasstown	Fine-loamy, mixed, subactive, mesic Typic Hapludults
Breakneck	Fine-loamy, isotic, frigid Humic Dystrudepts
Cataska	Loamy-skeletal, mixed, semiactive, mesic, shallow Typic Dystrudepts
Cheoah	Fine-loamy, isotic, mesic Typic Humudepts
Chiltoskie	Fine-loamy, isotic, frigid Typic Humudepts
Cullowhee	Coarse-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Fluvaquentic Humudepts
Dellwood	Sandy-skeletal, mixed, mesic Oxyaquic Humudepts
Dillard	Fine-loamy, mixed, semiactive, mesic Aquic Hapludults
Ditney	Coarse-loamy, mixed, semiactive, mesic Typic Dystrudepts
Ela	Coarse-loamy, mixed, superactive, acid, mesic Fluvaquentic Humaquepts
Fluvaquents	Fluvaquents
Heintooga	Loamy-skeletal, isotic, frigid Typic Humudepts
Hemphill	Fine, mixed, active, mesic Umbric Endoaqualfs
Jeffrey	Fine-loamy, isotic, mesic Humic Dystrudepts
Junaluska	Fine-loamy, mixed, subactive, mesic Typic Hapludults
Lonon	Fine-loamy, mixed, semiactive, mesic Typic Hapludults
Luftee	Loamy-skeletal, isotic, frigid Humic Dystrudepts
Northcove	Loamy-skeletal, mixed, semiactive, mesic Typic Dystrudepts
Pullback	Loamy, isotic, frigid Humic Lithic Dystrudepts
Reddies	Coarse-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Oxyaquic Humudepts
Santeetlah	Fine-loamy, isotic, mesic Typic Humudepts
Snowbird	Fine-loamy, mixed, active, mesic Humic Hapludults
Soco	Coarse-loamy, mixed, active, mesic Typic Dystrudepts
Spivey	Loamy-skeletal, isotic, mesic Typic Humudepts
Statler	Fine-loamy, mixed, active, mesic Humic Hapludults
Stecoah	Coarse-loamy, mixed, active, mesic Typic Dystrudepts
Sylco	Loamy-skeletal, mixed, active, mesic Typic Dystrudepts
Thurmont	Fine-loamy, mixed, active, mesic Oxyaquic Hapludults
Tsali	Loamy, mixed, subactive, mesic, shallow Typic Hapludults
Udorthents	Udorthents
Unicoi	Loamy-skeletal, mixed, semiactive, mesic Lithic Dystrudepts
Unison	Fine, mixed, semiactive, mesic Typic Hapludults
Wesser	Sandy-skeletal, mixed, mesic Humaqueptic Fluvaquents
Whiteoak	Fine-loamy, isotic, mesic Humic Dystrudepts

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