Prime Farmland

In this section, prime farmland is defined and the soils in Jackson County that are considered prime farmland are listed.

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. The acreage of high-quality farmland is limited, and the U.S. Department of Agriculture recognizes that government at local, State, and Federal levels, as well as individuals, must encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland soils, as defined by the U.S. Department of Agriculture, are soils that are best suited to food, feed, forage, fiber, and oilseed crops. Such soils have properties that favor the economic production of sustained high yields of crops. The soils need only to be treated and managed by acceptable farming methods. The moisture supply must be adequate, and the growing season must be sufficiently long. Prime farmland soils produce the highest yields with minimal expenditure of energy and economic resources. Farming these soils results in the least damage to the environment.

Prime farmland soils may presently be used as cropland, pasture, or woodland or for other purposes. They are used for food or fiber or are available for these uses. Urban or built-up land, public land, and water areas cannot be considered prime farmland. Urban or built-up land is any contiguous unit of land 10 acres or more in size that is used for such purposes as housing, industrial, and commercial sites, sites for institutions or public buildings, small parks, golf courses, cemeteries, railroad yards, airports, sanitary landfills, sewage treatment plants, and water-control structures. Public land is land not available for farming in National forests, National parks, military reservations, and State parks.

Prime farmland soils usually receive an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The acidity or alkalinity level of the soils is acceptable. The soils have few or no rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods and are not frequently flooded during the growing season. The slope ranges mainly from 0 to 8 percent.

The map units listed in table 5 are considered prime farmland in Jackson County. The location of each map unit is shown on the detailed soil maps at the back of this publication. The extent of each unit is given in table 4. The soil qualities that affect use and management are described in the section "Detailed Soil Map Units." This list does not constitute a recommendation for a particular land use.

Some soils that have a high water table and all soils that are frequently flooded during the growing season qualify as prime farmland only in areas where these limitations have been overcome by drainage measures or flood control. If applicable, the need for these measures is indicated in parentheses after the map unit name in table 5. Onsite evaluation is necessary to determine whether or not limitations have been overcome by corrective measures.

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis 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 Jackson County that 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 nonfarm 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 that is in harmony with nature.

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 steep slopes can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

Sally Stokes, district conservationist, and Bobby G. Brock, conservation agronomist, Natural Resources Conservation Service, and Kenneth McCaskill, county director, North Carolina Cooperative Extension Service, helped prepare this section.

General management needed for crops and pasture is suggested in this section. 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, and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under 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 or the North Carolina Cooperative Extension Service.

In 1990, about 6,456 acres was used for crops, pasture, and hay in Jackson County. Of this total, 5,300 acres was used as permanent pasture or hayland and 1,156 acres was used as cropland.

Agriculture in the county can be divided into three primary sectors—ornamental crops; high-value, small acreage field crops; and grain and forage crops associated with beef and dairy farming.

Ornamental Crops

Ornamental crops that are grown in Jackson County are Christmas trees and Christmas tree seedlings, native ornamentals, hybrid ornamentals, other woody ornamentals, outdoor flowers, and ginseng. These crops have the potential for high income, but they are relatively long-term investments that require intensive management. The ornamental crops that are grown in the county are concentrated in the southern and eastern parts and along the major streams.

Fraser fir is the most important species grown for use as Christmas trees. It is well adapted to loamy soils on north- to east-facing slopes at elevations above 3,000 feet. Plott, Tuckasegee, Cashiers, and Whiteside soils

commonly are used for growing Fraser fir for use as Christmas trees. Chandler, Fannin, and Edneyville soils are also suited to Fraser fir in high rainfall areas, such as the Glenville-Norton, Pine Creek, and Yellow Mountain areas. Fraser fir seedlings are commonly grown on the sandier, coarse textured soils on flood plains, such as Biltmore, Rosman, and Reddies soils along the Tuckasegee River and its major tributaries.

The soils on south- to west-facing slopes that are too hot and dry to grow Fraser fir commonly are planted to eastern white pine. Evard, Cowee, Edneyville, Chestnut, and Braddock soils commonly are used for growing eastern white pine for use as Christmas trees.

Native ornamentals, such as mountain laurel, dog hobble, mountain andromeda, rhododendron, eastern hemlock, and Carolina hemlock, also are grown commercially in the county. These plants grow well at higher elevations, generally above 3,000 feet. Native ornamentals can also be grown at lower elevations under the proper conditions. Native ornamentals that are balled and burlapped are better adapted to medium textured soils, such as Saunook and Tuckasegee soils. Those that are bare-root harvested are better adapted to coarse textured soils, such as Biltmore, Rosman, and Reddies soils. At higher elevations, these plants need protection from the strong winter winds.

Hybrid ornamentals, such as Chinese hollies, Japanese hollies, red leaf photenia, junipers, and outdoor flowers, are also grown in the county. These plants are better adapted to well drained, very deep, medium textured soils at lower elevations in the valleys. Saunook soils commonly are used for hybrid ornamentals.

Ginseng is a plant that is native to the county. It is grown commercially in several locations throughout the county. It commonly is grown under stands of white pine or under protective shade cloth in cool sites in coves. Saunook and Tuckasegee soils commonly are used for growing ginseng. Stones on the surface are a significant management problem in many sites that could be used to grow ginseng.

High-Value, Small Acreage Field Crops

High-value, small acreage field crops, such as cabbage, broccoli, tomatoes, and burley tobacco, commonly are grown in Jackson County. These crops require intensive management and a high input of labor.

Cabbage and broccoli generally are grown at elevations above 3,000 feet in the Glenville-Norton, Pine Creek, and Yellow Mountain areas of the county, where rainfall during the growing season is high. Some cabbage and broccoli are also grown along the Tuckasegee River and its major tributaries. Tuckasegee, Whiteside, Edneyville, Biltmore, Rosman, and Statler soils commonly are used for cabbage and broccoli.

Tomatoes and burley tobacco are grown mainly on soils on flood plains and stream terraces in the central and northern parts of the county. These crops grow best in well drained, very deep, medium textured soils. Saunook, Statler, Rosman, and Dillsboro soils commonly are used for tomatoes and burley tobacco.

Grain and Forage Crops

Grain and forage crops associated with beef and dairy farms are scattered throughout the county and are grown on a wide variety of soils. Corn and other grains and forage crops commonly are grown on soils on flood plains and stream terraces where equipment can be used. Soils that have a slope of more than 30 percent should not be used because equipment cannot operate safely on these soils. Braddock, Dillsboro, Cullowhee, Rosman, Reddies, and Statler soils commonly are used for grain and forage crops.

Water Management

Soils on flood plains in Jackson County are very productive and intensively used for agricultural crops but require a high level of management for optimum production. Swift floodwaters can result in partial or complete losses of crops during the growing season. Scouring by swift floodwaters can severely damage soils on flood plains. Wetness is also a major limitation on some soils, such as Cullowhee and Nikwasi soils, that are on flood plains along the smaller streams. Installing a tile drainage system on these soils is difficult but necessary for optimum crop production.

Management of surface water is also important on soils on flood plains that are used as cropland. Diversions, grassed waterways, and land smoothing are a few measures that control the hazard of erosion. Onsite investigation is essential before proper management can be determined.

Erosion Control

Erosion is a major hazard on soils in the uplands that are used as cropland in Jackson County. Soils on uplands that have a slope of more than 4 percent are susceptible to erosion, and the hazard of erosion increases on the steeper and longer slopes. Erosion is costly for several reasons. Topsoil, water, pesticides, fertilizers, lime, and organic matter are lost if erosion is not controlled. Productivity decreases, and sediments, agricultural chemicals, and nutrients pollute streams, lakes, and reservoirs. Trout streams are especially sensitive to damage caused by sediments.

Conservation tillage is the most effective erosion-control measure used in the county. Soil and water are

conserved by providing a year-round cover, such as stubble left during no-till farming. No-till farming also minimizes evaporation during the growing season and improves tilth. Many areas of cropland are downslope from steep pastures, and runoff from these pastures results in a serious hazard of erosion in those areas of cropland. Diversions can intercept this runoff and route it to a safer outlet, such as a grassed waterway.

Stripcropping is also an effective resource management system, but the small size of fields in the county minimizes its use. Where practical, stripcropping provides effective soil and water conservation through rotations of crops and grasses, crop residue, and cover crops. An effective resource management system can also include diversions, field borders, and grassed waterways.

Pasture and Hayland Management

Pasture and hayland in Jackson County contain a wide variety of soil types, many of which are together in an individual field. In the same pasture, poorly drained soils on flood plains are often adjacent to the steeper, well drained soils on uplands. Because of these landscape conditions, droughtiness and wetness are often in the same pasture.

Pastures are common on soils that have a slope of more than 30 percent. Such pastures are very difficult to manage. Proper fertility is difficult to maintain, and woody vegetation, especially multiflora rose and black locust sprouts, are very hard to control.

In many areas, concentrated rotational grazing is effective so that the animals can better utilize all of the forages in the pasture. Fencing livestock out of the pastures on clayey soils during wet periods, however, helps to prevent severe compaction. Overgrazing results in runoff and a severe hazard of erosion on pastures on the steep mountains. Good pasture and hayland management measures conserve soil and water while improving water quality.

Chemical Weed Control

The use of herbicides for weed control is a common practice on the cropland in Jackson County. It decreases the need for tillage and is an integral part of reduced tillage operations. Selected soil properties, such as organic matter content and texture of the surface layer, affect the rate of herbicide application. Estimates of both of these properties were determined for the soils in the county. Table 15 shows a general range of organic matter content in the surface layer of the soils. The texture of the surface layer is shown in the USDA texture column in table 14.

In some areas the organic matter content projected for the different soils is outside the range shown in table 15. The content can be higher in soils that have received high amounts of animal or manmade waste. Soils that have recently been brought into cultivation may have a higher content of organic matter in the surface layer than similar soils that have been cultivated for a long time. Conservation tillage tends to increase the content of organic matter in the surface layer. A lower content of organic matter is common where the surface layer has been partly or completely removed by erosion or land smoothing.

Soil Fertility

The soils in Jackson County generally are low in natural fertility. They are naturally acid. Additions of lime and fertilizer are needed for the production of most kinds of crops. Ellijay soils, which formed from ultramafic rocks, are less acid but have a severe calcium-magnesium imbalance.

Liming requirements are a major concern on cropland. The acidity level in the soil affects the availability of many nutrients to plants and the activity of beneficial bacteria. Lime also neutralizes exchangeable aluminum in the soil and thus counteracts the adverse effects high levels of aluminum on many crops. Liming adds calcium (from calcitic lime) or calcium and magnesium (from dolomitic lime) to the soil.

A soil test is a guide to what amount and kind of lime should be used. For example, Ellijay soils have a high level of magnesium; and dolomitic lime should not be used. Calcitic lime helps to restore the proper calcium-magnesium ratio. Dolomitic lime is appropriate to use, however, on most of the other soils in the county. Also, the desired pH levels may differ, depending on the crop to be grown.

Nitrogen fertilizer is required for most crops. It is generally not required, however, for clover that is established or for alfalfa or other legumes that can extract nitrogen from the air. A reliable soil test is not available for predicting nitrogen requirements. Appropriate rates of nitrogen application are described in the section "Yields per Acre."

Soil tests can indicate the need for phosphorus and potassium fertilizer. They are needed because phosphorus tends to build up in the soil.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other weather factors.

The yields are based mainly on the experience and records of farmers, conservationists, and extension

agents. Available yield data from similar soils in nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

A high level of management includes maintaining proper soil reaction and fertility levels as indicated by standard soil tests. The application rate of nitrogen for corn on soils that have a yield potential of 125 to 150 bushels per acre should be 140 to 160 pounds per acre. If the yield potential for corn is only 100 bushels per acre or less, a rate of 100 to 120 pounds of nitrogen per acre should be used. 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 a crop is an unnecessary expense and causes a hazard of water pollution. Because nitrogen can be readily leached from sandy soils, such as Biltmore soils, several small applications may be needed on these soils throughout 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 acreage of such crops is small. The local office of the Natural Resources Conservation Service or of 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 use as cropland *(19)*. 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. Land 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 land capability classification 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 Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

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

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

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

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

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

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

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

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

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

The capability classification of each map unit component is given in the section "Detailed Soil Map Units" and in table 6.

Woodland Management and Productivity

Albert Coffey, forester, Natural Resources Conservation Service, helped prepare this section.

Owners of woodland in Jackson County have many objectives. These objectives include producing timber; conserving wildlife, soil, and water; preserving aesthetic values; and providing opportunities for recreational activities, such as commercial hunting. Public demand for clean water and recreational areas creates pressures and opportunities for owners of woodland.

The landowner interested in timber production is faced with the challenge of producing greater yields per acre. Meeting this challenge requires intensive management and silvicultural practices. Many modern silvicultural techniques resemble those long practiced in agriculture. They include establishing, weeding, and thinning a desirable young stand; propagating the more productive species and genetic varieties; providing short rotations and complete fiber utilization; and controlling insects, diseases, and weeds. Even though timber crops require decades to grow, the goal of intensive management is similar to the goal of intensive agriculture. This goal is to produce the greatest yield of the most valuable crop as quickly as possible.

Jackson County has a total of 276,537 acres of woodland *(18)*. Extensive hardwood forests in the Appalachian Mountains that are part of one of the largest hardwood ecosystems in the world are in the county *(17)*. Commercial forests cover 263,288 acres, or about 83 percent of the land area in the county *(18)*. Commercial forest is defined as land that is producing or is capable of producing crops of industrial wood (at least 20 cubic feet per acre per year) and that has not been withdrawn from timber production. In the county, 12,722 acres of reserved timberland are not available for commercial timber production because of legislative or administrative decisions. The reserved timberland includes areas that have both commercial and noncommercial potential. An additional 527 acres of noncommercial woodland in the county produces less than 20 cubic feet per acre per year and is not in timberland reserve.

Some of the most important timber species in the county are northern red oak, white oak, black cherry, yellow-poplar, and white pine. They are adapted to the soils and climate. Generally, these species bring the highest average sale value per acre.

For management purposes timber sites are generally placed in a forest type group, such as yellow-poplar, oak-hickory, northern red oak, shortleaf pine, eastern white pine, or red spruce-Fraser fir. The characteristics of a given site are often indicated by the forest type on that site. In places, the effects of past management determine the current forest type. Some sites are well suited to more than one forest type *(14)*.

Yellow-poplar. This forest type most commonly is in coves and drainageways. It produces the highest volume of wood per acre of all the forest types in the county. Yellow-poplar is, by far, the most common species in areas of this forest type. Stands also have numbers of northern red oak, white oak, black cherry, sweet birch, eastern hemlock, black locust, American basswood, sugar maple, and yellow buckeye. At elevations of more than 4,000 feet, yellow-poplar is less dominant and northern red oak, black cherry, sweet birch, yellow birch, eastern hemlock, American beech, and sugar maple are more common. Northern red oak, white oak, black cherry, and sugar maple are more valuable than yellow-poplar. They are favored in timber management practices. Soils that commonly support this forest type include Saunook, Tuckasegee, Cullasaja, Spivey, Santeetlah, and Whiteside soils.

Oak-hickory. This forest type is on side slopes and ridges on south to west aspects at elevations as high as about 4,800 feet. It is the most extensive forest type in the county. It produces the lowest volume of wood per acre and shows the most effects of past high grading. Sites of this forest type are hotter and drier than sites of the northern red oak forest type. If properly managed, this forest type can produce high-quality timber. Dominant species are scarlet oak, chestnut oak, black oak, and hickories. Associated species include white oak, red maple, pitch pine, and eastern white pine. Soils that commonly support this forest type include Chestnut, Cowee, Edneyville, Evard, Fannin, Chandler, Brasstown, Junaluska, Soco, Stecoah, and Tsali soils.

Northern red oak. This forest type is on uplands that have a cool aspect at elevations of about 3,000 to 5,300 feet. Below an elevation of 4,000 feet, it is mainly on north- to east-facing side slopes. Above an elevation of 4,500 feet, it is on ridges and side slopes on various aspects. Northern red oak is the most common species. Yellow-poplar, black cherry, American beech, sweet birch, yellow birch, and sugar maple make up a large part of many stands. Associated species that require cool temperatures, such as yellow buckeye and eastern hemlock, are common in some stands. A large percentage of the trees on this forest type are of valuable species, and thus this forest type commonly has the most valuable stands of timber. Soils that commonly support this forest type include Plott, Trimont, Cashiers, and Cheoah soils. Above an elevation of 4,800 feet, soils that commonly support this

forest type are Wayah, Burton, Craggey, and Oconaluftee soils. Most of the soils at elevations of more than 4,800 feet are not used as sites for commercial timber production. The trees at these higher elevations grow slowly and have poor form because of frequent ice storms and high winds.

Shortleaf pine. This forest type is in areas that have been cleared of trees and reseeded or planted to pine. It most commonly is on ridges and south- to west-facing side slopes in the low mountains. Shortleaf pine, pitch pine, and Virginia pine are the prevalent species in areas of this forest type. This forest type is of medium acreage. Associated dry site hardwoods include scarlet oak, chestnut oak, blackgum, and sourwood. Soils that commonly support this forest type include Evard, Cowee, Brasstown, Junaluska, and Tsali soils.

Eastern white pine. This forest type occurs naturally in the southern and eastern parts of the county. In many areas, however, it has been planted. It most commonly is on ridges and side slopes that previously supported the oak-hickory forest type or in abandoned pastures. These areas were converted because eastern white pine produces more volume and has shorter rotations than the trees of the oak-hickory forest type. Soils that commonly support this forest type are Chandler, Fannin, Cashiers, Edneyville, and Chestnut soils.

Red spruce-Fraser fir. This forest type occurs in the high mountains at elevations of more than 5,300 feet. It is mainly in the eastern part of the county along the Haywood County line. Jackson County is the southernmost area of this forest type. In most areas, it is in noncommercial timber, and the acreage is decreasing because of infestations of the balsam woolly aphid and various environmental factors. Because of these factors, many Fraser fir trees are dead or dying and red spruce is common in most stands. Fraser fir seedlings are abundant, however, on the forest floor. Soils that commonly support this forest type are Wayah, Oconaluftee, Tanasee, Balsam, Burton, and Craggey soils.

One of the first steps in planning intensive woodland management is to determine the potential productivity of the soil for several alternative tree species. The most productive and 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 expenses and profits associated with intensive woodland management, land acquisition, or industrial investments.

The potential productivity of woodland 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 the water table, affect forest productivity primarily by influencing available water capacity, aeration, and root development. The net effects of the interaction of these soil properties and site characteristics determine the potential site productivity.

Other site factors are also important. The gradient and length of slopes affect water movement and availability. Sites on concave slopes are more productive than those on convex slopes because available water is greater. Elevation and aspect affect the amount of sunlight a site receives and the rate of evaporation. Sites on south- to west-facing slopes are warmer and drier than those on north-facing slopes, except where the south- to west-facing slopes are shaded by the higher mountains (fig. 18). The shading produces the cooler microclimate common on north- to east-facing slopes. The best sites are generally on north to east aspects on the lower slopes, in sheltered coves, and on gently sloping, concave slopes. The amount of rainfall and length of growing season influence site productivity. Areas that receive 60 inches or more of rainfall per year generally are good sites for timber production even if the soil properties are not the best. Generally, as rainfall increases, site productivity is greater.

In the eastern and southern parts of the county, where the average annual precipitation is 80 inches or more, natural stands of eastern white pine that have a site index in the high eighties produce 150 to 160 cubic feet per acre per year and have a productivity class of 11. In parts of the county that have 60 inches of rainfall or less and the same soils, the site index is in the low seventies and the volume of timber is almost half of that recorded in areas that have a higher amount of rainfall. Productivity increases as the present stands are harvested and are replaced by genetically improved trees with proper stocking.

This soil survey can be used by woodland managers planning ways to increase the productivity of forest land. Some soils respond better to applications of fertilizer than others, and some 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 suitable for timber includes information about productivity, limitations in harvesting timber, and management concerns in producing timber. Table 7 summarizes this forestry information and rates the soils for a number of factors to be considered in management. *Slight, moderate,* and *severe* are used to indicate the degree of the major soil limitations to be considered in forest management.

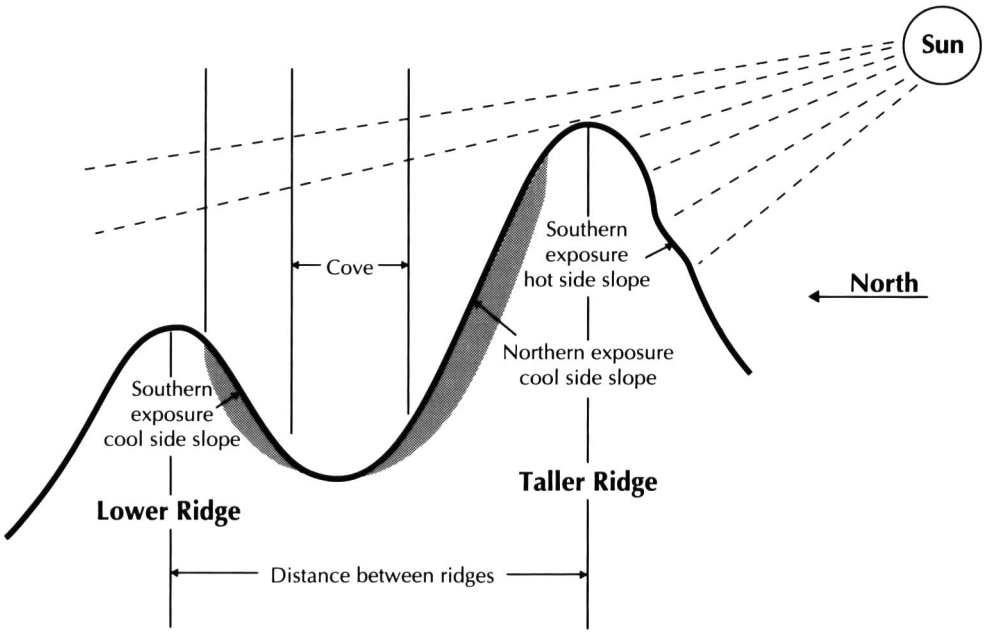

Figure 18.—The steep, rugged mountains in Jackson County vary in size. In many areas the high mountains shade the low and intermediate mountains.

Table 7 lists the *ordination symbol* for each soil. The first part of the ordination symbol, a number, indicates the potential productivity of a soil for the indicator species in cubic meters per hectare per year. The larger the number, the greater the potential productivity. Potential productivity is based on the site index and the point where mean annual increment is the greatest.

The second part of the ordination symbol, a letter, indicates the major kind of soil limitation affecting use and management. The letter *R* indicates a soil that has a significant limitation because of the slope. The letter *X* indicates that a soil has restrictions because of stones or rocks on the surface. The letter *W* indicates a soil in which excessive water, either seasonal or year-round, causes a significant limitation. The letter *T* indicates a soil that has, within the root zone, excessive alkalinity or acidity, sodium salts, or other toxic substances that limit the development of desirable trees. The letter *D* indicates a soil that has a limitation because of a restricted rooting depth, such as a shallow soil that is underlain by hard bedrock, a hardpan, or other layers that restrict roots. The letter *C* indicates a soil that has a limitation because of the kind or amount of clay in the upper part of the profile. The letter *S* indicates a dry, sandy soil. The letter *F* indicates a soil that has a large amount of coarse fragments. The letter *A* indicates a soil having no significant limitations that affect forest use and management. If a soil has more than one limitation, the priority is as follows: R, X, W, T, D, C, S, and F.

Ratings of the *erosion hazard* indicate the probability that damage may occur if site preparation or harvesting activities expose the soil. The risk is *slight* if no particular preventive measures are needed under ordinary conditions; *moderate* if erosion-control measures are needed for particular silvicultural activities; and *severe* if special precautions are needed to control erosion for most silvicultural activities. Ratings of moderate or severe indicate the need for construction of higher standard roads, additional maintenance of roads, additional care in planning harvesting and reforestation activities, or the use of special equipment.

Ratings of *equipment limitation* indicate limits on the use of forest management equipment, year-round or seasonal, because of such soil characteristics as slope, wetness, stoniness, and susceptibility of the surface layer to compaction. As slope gradient and length increase, the use of wheeled equipment becomes more difficult, and tracked equipment is needed. On the steepest slopes, even tracked equipment cannot be operated and more sophisticated systems, such as a cable yarding system, are needed. The rating is *slight* if equipment use is restricted by wetness for less than 2 months and if special equipment is not needed. The

rating is *moderate* if slopes are so steep that wheeled equipment cannot be operated safely across the slope, if wetness restricts equipment use from 2 to 6 months per year, if stoniness restricts the use of ground-based equipment, or if special equipment is needed to prevent or minimize compaction. The rating is *severe* if slopes are so steep that tracked equipment cannot be operated safely across the slope, if wetness restricts equipment use for more than 6 months per year, if stoniness restricts the use of ground-based equipment, or if special equipment is needed to prevent or minimize compaction. Ratings of moderate or severe indicate a need to choose the best suited equipment and to carefully plan the timing of harvesting and other management activities.

Ratings of *seedling mortality* refer to the probability of the death of the naturally occurring or properly planted seedlings of good stock in periods of normal rainfall, as influenced by kinds of soil or topographic features. Seedling mortality is caused primarily by too much water or too little water. The factors used in rating a soil for seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of time when the water table is high, amount of rock fragments in the surface layer, rooting depth, and the aspect of the slope. The mortality rate generally is highest on soils that have a sandy or clayey surface layer. The risk is *slight* if, after site preparation, expected mortality is less than 25 percent; *moderate* if expected mortality is between 25 and 50 percent; and *severe* if expected mortality exceeds 50 percent. Ratings of moderate or severe indicate that it may be necessary to use containerized or larger than usual planting stock. Special site preparations, such as providing artificial shade for seedlings, may be required. Reinforcement planting is often needed if the risk is moderate or severe.

Ratings of *windthrow hazard* indicate the likelihood that trees will be uprooted by the wind. A restricted rooting depth is the main reason for windthrow. The rooting depth can be restricted by a high water table, a fragipan, or bedrock or by a combination of such factors as soil wetness, texture, structure, and depth. The risk is *slight* if strong winds break trees but do not uproot them; *moderate* if strong winds blow a few trees over and break many trees; and *severe* if moderate or strong winds commonly blow trees over. Ratings of moderate or severe indicate that care is needed in thinning or that the stand should not be thinned at all. Special equipment may be needed to prevent damage to shallow root systems in partial cutting operations. A plan for the periodic removal of windthrown trees and the maintenance of a road and trail system may be needed.

The *potential productivity* of *common trees* on a soil is expressed as a *site index* and a *volume* number. The predominant common trees are listed in table 7 in the order of their observed occurrence. Additional species that commonly occur on the soils may be listed in the detailed soil map unit descriptions. Generally, only two or three tree species dominate. The first tree listed for each soil is the indicator species for that soil. An indicator species is a tree that is common in the area and that is generally the most valuable on a given soil.

For soils that are commonly used for timber production, the yield is predicted in cubic feet per acre per year. It is predicted at the point where mean annual increment culminates. The estimates of the productivity of the soils in this survey are based mainly on yellow-poplar, northern red oak, chestnut oak, shortleaf pine, Virginia pine, scarlet oak, red spruce, and eastern white pine *(3, 8, 10, 12)*.

The *site index* is determined by taking height measurements and determining the age of selected trees within stands of a given species. This index is the average height, in feet, that the trees attain in a specified number of years (50 years in this survey). This index applies to fully stocked, even-aged, unmanaged stands. Productivity of a site can be improved through management practices, such as bedding, ditching, managing water, applying fertilizer, and planting genetically improved species.

Site indices were assigned using available plot data and comparison curves. Where sufficient plot data exists, a site index was assigned based on data from soils that have similar properties. The site index may vary considerably among sites that have the same soil, especially in the mountains, because of the influence of climate, relief, landform position, aspect, drainage, and elevation.

The *volume* is the yield likely to be produced by the most important trees, expressed in cubic feet per acre per year.

Trees to plant are those that are used for reforestation or, under suitable conditions, natural regeneration. They are suited to the soils and can produce a commercial wood crop. The desired product, topographic position (such as a low, wet area), and personal preference are three factors among many that can influence the choice of trees for use in reforestation. If hardwoods are desired on a forest site, acceptable species should naturally reproduce from seeds and sprouts. Special site preparation techniques may be required. Planting of hardwoods on a specific site should be based on the recommendations of a forester. Fraser fir is planted for use as Christmas trees only.

Recreation

Jim Borawa, fisheries biologist, North Carolina Wildlife Resources Commission, helped prepare this section.

The soils in Jackson County play an important role in determining the types of recreational uses, such as hiking, camping, snow skiing, boating, or sightseeing. Knowledge of the soils is valuable for managing areas that have the potential for recreational development.

The Blue Ridge Parkway lies along the northeast border of the county. It attracts millions of people each year, especially during the fall color season in October. The scenic beauty is enjoyed by campers, hikers, fishermen, hunters, sightseers, and photographers. The high peaks and areas of rock outcrop throughout the county provide some of the best scenic views in the area, especially at Richland Balsam, which is the highest peak on the Blue Ridge Parkway at an elevation of 6,053 feet. This area is in a relict forest of red spruce and Fraser fir interspersed with natural balds. Wayah, Balsam, Tanasee, Burton, and Craggey soils are the most common soils along the Blue Ridge Parkway in Jackson County.

The soils in the Cleveland-Chestnut-Rock outcrop complex are in similar areas but at lower elevations, such as on Whiteside Mountain in the southern part of the county. Whiteside Mountain is the highest rock cliff in the eastern United States and is visited by many tourists annually.

The Cherokee Indian Reservation in the northern part of the county provides many cultural features, such as the drama "Unto These Hills" and the Oconaluftee Indian Village, which is a replica of a historic Cherokee Indian village. Fishing is also permitted on several streams on the reservation, and fishing permits may be obtained on a daily basis. Many of the soils in this survey bear Cherokee names, such as Junaluska, Tsali, Wayah, Soco, Stecoah, and Nikwasi.

The county also is only a short distance from the entrance to the Great Smoky Mountains National Park, which is one of the major tourist attractions in the East. The Great Smoky Mountains provide miles of scenic rivers and hiking trails for campers and outdoor enthusiasts who enjoy beautiful scenery. Fishing in the park is allowed by permit, but no hunting is allowed. A major part of the Appalachian Trail also crosses the Great Smoky Mountains.

More than 68,000 acres of the Nantahala National Forest is in the county. This National forest provides several miles of hiking and backpacking trails and numerous designated campsites. Part of the forest was designated as the Ellicott Rock Wilderness in the early 1980's. Hunting is allowed on part of these public lands, and several miles of native trout waters are in this area. The Chattooga River, which is in the Ellicott Rock Wilderness, is well known for white water canoeing and rafting. Whitewater Falls, which at 411 feet is the second highest waterfall in the eastern United States, is on the Whitewater River between Jackson and Transylvania Counties and is a major scenic attraction in the southeastern part of the county.

The headwaters of the Tuckasegee River are in Jackson County, and the river flows through the county. It provides such activities as canoeing, rafting, tubing, camping, picnicking, and fishing. In the county, about 50 miles of waters, including the Tuckasegee River, are stocked with trout. Rainbow trout, brown trout, and muskellunge are common game fish in the Tuckasegee River. Access to the river is easier in areas where the topography is flatter, especially along flood plains or stream terraces. Some of these areas are used for playgrounds, ball fields, and picnic areas because of the scenic value and the flatter terrain.

Fishing and boating are major recreational activities in the county on Lake Thorpe, Bear Lake, Wolf Lake, and Cedar Cliff Lake. These lakes have access for public boating and are populated with largemouth bass, brim, walleye, crappie, and trout. These lakes also provide good water skiing.

The areas around Cashiers and Sapphire in the southern part of the county offer such activities as golf, tennis, horseback riding, and snow skiing.

Western North Carolina and Jackson County attract millions of people annually who enjoy outdoor recreational opportunities and scenic beauty. This area of the state continues to attract visitors because it is near large, populated areas, such as Atlanta, Georgia; Washington, D.C.; Charlotte, North Carolina; and Knoxville, Chattanooga, and Nashville, Tennessee.

In table 8, the soils of the survey area are rated according to the limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for 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.

In table 8, the degree of soil limitation is expressed

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

The information in table 8 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 11 and interpretations for dwellings without basements and for local roads and streets in table 10.

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

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

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock should be considered.

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

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Dr. Richard Bruce and Dr. Jerry West, Western Carolina University; L. Hilman and L. Luckett, U.S. Forest Service; R. Porterfield and J. Davies, North Carolina Wildlife Resources Commission; and John P. Edwards, biologist, Natural Resources Conservation Service, helped prepare this section.

Soils are a major factor in determining the amount and distribution of food, water, and cover available for wildlife habitat. The many soils in Jackson County help to form 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 springs and seeps.

Knowledge of soil types and the plant communities they support is valuable in managing wildlife. Generally, wildlife occupy the soils that are most suitable for food, water, and cover requirements. Soils that have good potential for wildlife habitat 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 the creation of wildlife refuges.

The soils of the county support vast areas of woodland wildlife habitat. Many areas of woodland are in mature mixed hardwoods that produce a variety of hard and soft mast. Black bear, turkey, gray squirrel, and woodpeckers, in particular, benefit from such habitat. Edneyville, Evard, Cowee, and Chandler soils on the warm south aspects provide food and cover, such as oaks, hickory, dogwood, pine, and mountain laurel. The cooler north-facing soils, such as Plott, Cashiers, and Trimont soils, support a plant community consisting of yellow-poplar, American beech, black cherry, and rhododendron. Areas of the shallow Cleveland soils and rock outcrop support many varieties of lichens, grasses, and forbs. Also, the many twisted and dead trees associated with Cleveland soils and areas of rock outcrop serve as important nesting places for woodland wildlife.

The availability of water and moisture is a key element in wildlife habitat. Soils in coves, such as Cullasaja, Tuckasegee, Whiteside, and Sylva soils, have a cool, moist environment and frequently have

seeps, springs, or small streams. Boulders, stones, or dense thickets of rhododendron on 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-facing slopes contribute to wildlife habitat by providing moisture and a diversity of plants to an otherwise uniform plant community.

Woodland wetlands along the larger rivers and streams also contribute to habitat diversity. Nikwasi soils support a dense plant cover, such as rhododendron, red maple, and dog hobble. Raccoon, mink, beaver, and many reptiles and amphibians utilize this habitat.

The cool water resources of the county support brook trout, brown trout, and rainbow trout. The cooler rivers have a small population of smallmouth bass, and walleye are in Lake Thorpe. Largemouth bass, bluegill, crappie, and other sunfish are dominant in the warm water lakes and ponds.

The severe climate at high elevations limits the potential for diversity among tree species. Such soils as Wayah and Oconaluftee soils support yellow birch, sweet birch, and northern red oak. They also commonly support pure stands of red spruce and Fraser fir. The dense stands of red spruce and Fraser fir support red squirrels and several less common species of salamander. The soils on high elevations support many varieties of soft mast, forbs, and grasses, especially on balds and in open areas. Black bear, ruffed grouse, cottontail rabbit, small numbers of deer, and other animals utilize these areas. Hawks and other birds of prey use the open areas for hunting.

The size and remoteness of the habitat at high elevations is critical in some wildlife management programs. These areas are becoming increasingly important to species that require large tracts of habitat, such as the black bear. The balds in particular have the potential to support a small population of golden eagles that has been reestablished in the county. Shallow, rocky crags in areas of Burton and Craggey soils and areas of rock outcrop have already served as suitable habitat for the reintroduction of the endangered peregrine falcon to the county.

Many open areas are the result of human activities. Generally, open spaces in the county occur mainly on the less sloping landscapes at the lower elevations. Such soils as Nikwasi, Dellwood, Cullowhee, Rosman, Statler, Dillard, Braddock, and Hemphill soils are commonly used for agricultural purposes, which often benefit wildlife species. The complex soil and vegetation patterns associated with the open areas at the lower elevations provide the most habitat diversity when suitable woodland cover is nearby.

Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants. In open areas, soil conservation measures, such as field borders and vegetative filter strips, provide the needed food and cover. Establishing plant cover along access roads helps to provide food for wildlife and helps to prevent the sedimentation of lakes and streams. 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 wildlife habitat for many species. The needs of wildlife habitat should be considered in all decisions involving the use of the land.

In table 9, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat. The ratings given in the table are intended to be used as a guide and are not site specific. Onsite investigation is needed for individual management plans.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

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

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface

stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, lovegrass, orchardgrass, Kentucky bluegrass, clover, sericea lespedeza, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, aster, and pokeberry.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, yellow-poplar, black cherry, apple, dogwood, hickory, American beech, greenbrier, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are hawthorn, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, and cedar.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, slope, and surface stoniness. Examples of wetland plants are smartweed, ferns, arrowhead, dog hobble, needlerush, cattail, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams or highway embankments. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are shallow depressions on flood plains and small ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, mourning dove, songbirds, hawks, cottontail rabbit, white-tailed deer, groundhog, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, bobcat, chipmunks, woodpeckers, gray squirrel, red squirrel, gray fox, raccoon, white-tailed deer, and black bear.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are wood ducks, herons, weasels, muskrat, mink, raccoon, and beaver.

Engineering

Howard Tew, area engineer, 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 should 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 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, earthfill, 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 defined in the Glossary.

The soils in Jackson County range from soils on flood plains and gently sloping terraces to soils on mountaintops and ridges at elevations above 6,000 feet. Landowners use the soils in the county for a wide range of purposes, from the production of burley tobacco to foundations for the construction of multi-unit condominiums. The soils in many areas of the county may be easily developed by conventional engineering design techniques. Other soils require considerable specialized engineering and construction techniques to overcome their inherent limitations. If construction problems are to be prevented, planning any engineering activity must consider the limitations of the soils. Soil interpretations for many uses are provided in the tables for planners to use in evaluating the limitations of the soil as potential construction sites.

A number of soil characteristics that pose difficulties in engineering are in the county. These characteristics are factors inherent to mountainous terrain and climate. Among the most important characteristics are the slope, instability caused by poor bearing or shear strength, stoniness, freeze-thaw action, seeps and springs, and the shallow depth to bedrock.

Slope. Many of the soils in the county are on slopes of more than 15 percent. Slopes commonly range up to 95 percent and in places are nearly vertical. The slope directly or indirectly influences the use of a soil in a number of ways. Runoff from watersheds that have large areas of steep and very steep slopes results in unusually high peak rates and flow velocities, especially in the areas of the county where rainfall totals between 80 to 100 inches annually. The design of water flow and impoundment structures must meet exacting standards to provide for this runoff. Ponds and sediment basins are likely to be damaged or may wash out if design and construction do not adequately handle peak runoff events. Damage to downstream areas and subsequent liability in case of a failure are primary considerations of design. Excavations on steep and very steep soils in the mountains commonly result in a severe hazard of erosion and offsite damage caused by sedimentation.

Erosion control on steep slopes presents a unique challenge. If runoff accumulates and moves down the steep and very steep slopes, a severe hazard of erosion occurs unless definite erosion-control measures have been taken.

Construction that requires significant cuts and fills on the steep and very steep slopes calls for careful planning and special construction techniques. Long and extremely steep fill slopes may result from cuts and fills on steep and very steep land. Fill slopes generally are dominated by saprolite and rock fragments. Generally, the saprolite is very infertile, and its reaction ranges from strongly acid to extremely acid. These characteristics result in difficulties in stabilizing the slope with vegetation.

The density of fill slopes generally is low and the porosity high. As water moves through a fill slope, settling occurs. As the pores fill with water, the fill slope gets heavier. This may cause severe slope failure. In many areas, soils that have a low content of mica are underlain by saprolite that has a high content of mica. When these fill slopes take in water, severe failure of the slope occurs at a lower water content than on fill slopes that do not have a high amount of mica. Detailed engineering testing and design are often needed before building on fill slopes to prevent damage from settling and slope failures.

Instability. Undisturbed soils must possess an inherent bearing strength to support loads, such as high fills, buildings, or vehicular traffic. Undisturbed, sloping

soils also should provide a degree of shear strength to support their own weight. Additional loading puts greater stress on the soil. When loading stresses exceed bearing or shear strength, the soils may move unpredictably. Loading stresses exceed bearing or shear strength on unstable soil material much more quickly than on stable soil material.

Soil material moves more freely when lubricated. Such lubrication of soils occurs where high concentrations of mica are in the soil. Mica can be detected by a shiny sparkle when the soil is struck by the sun or other bright light and by a slick, greasy consistence of the soil. Water also serves as a soil lubricant. If soil material becomes saturated, it tends to move away from the loading forces applied to it. Whether lubricated by natural particle characteristics or by water, a soil that moves provides very little shear strength. A micaceous soil or a soil that has seeps and springs is a poor choice for construction sites because of poor strength and susceptibility to slippage or landslides (fig. 19). Chandler, Cashiers, and Fannin soils in the eastern and southern parts of the county have a high content of mica. These soils are unstable because of the natural lubricants, mica, and high rainfall.

Metasedimentary soils in the northern part of the county, such as Oconaluftee, Cheoah, Stecoah, and Soco soils, are also unstable. In these soils, the instability results from the underlying bedrock, which lies in plates that in many places run about parallel to the natural slope of the land. These plates provide very little shear strength and tend to slide across one another when loaded.

Excavations and access road construction on the steep and very steep terrain remove the lateral support holding the soil back. In time, these soils may move downslope, resulting in damage to roads, structures, and streams. For example, the landslides along Dicks Creek Road in the northwestern part of the county are the result of the unstable soils losing their lateral support.

The soils on flood plains at the headwaters of the Tuckasegee River are made up predominantly of sand and gravel. These soils have little natural plasticity and may become unstable when saturated. Dellwood soils are an example. If not bound together by clay, these soils flow in a thick liquid slurry. Deep excavations are difficult to make in such soils and can be dangerous. Sidewalls cave in and slough off when lateral support is removed. Preventing cave-ins requires extensive shoring of the walls.

Most soils in the mountains contain rock fragments. Some soils, such as Spivey or Cullasaja soils, may be very stony throughout. Other soils in coves, such as Saunook soils, may have stones in some part of the profile. Soils on flood plains, such as Dellwood and Cullowhee soils, are underlain by a strata of smooth, water-rounded rocks, ranging from fine gravel to large cobbles. Other soils on flood plains, such as Rosman and Biltmore soils, do not have stone lines within a depth of 40 inches. The content of stones on some soils in the mountains, such as Stecoah and Edneyville soils, may vary from only a few scattered rock fragments to as much as 35 percent of the soil, by volume. At a specific location, the content of stones may vary greatly through the soil profile.

Construction and development require compaction of fill material to provide a firm foundation and impervious layers. Where an excess content of stones in fill material inhibits compaction, unacceptable settlement is likely to occur, resulting in damage to structures. Shallow excavations and fine grading may be difficult in excessively stony soils. Removal of rock fragments from stony soils is expensive and time consuming.

If soils are analyzed for engineering purposes, the content of stones should receive special emphasis. The Unified Soil Classification System (USCS) evaluates only the soil material less than 3 inches in diameter. For example, the USCS classification of material shown as SC (sand with clay fines) does not account for rock fragments larger than 3 inches; however, that soil may be very stony and not suited to fill material. The ranges for rock fragments larger than 3 inches are shown in table 14. Determining actual conditions requires onsite investigation.

Hard bedrock is at a depth of 10 to 40 inches in some soils in the county, such as Cleveland, Burton, and Craggey soils. Other soils, such as Chestnut, Cowee, Junaluska, Soco, and Tsali soils, have soft, weathered bedrock at a depth of 10 to 40 inches. Hard bedrock cannot be excavated by machinery. The surface of these restrictive features is undulating below the soil surface, and onsite investigation is needed to determine its topography before construction begins. Material excavated from soft, weathered bedrock is dry, brittle, and difficult to compact.

Freeze-thaw cycle. The soils in the county that are on south-facing slopes are exposed to continual freezing and thawing from November to March. Repeated winter freeze-thaw cycles create heaving and sloughing of the soils on the surface. Fine grained soils are the most susceptible to heaving.

Frost action loosens the surface of the soil and may heave it above its normal position. Subsequent thawing may leave the surface soil in a near liquid state. In this condition the soil is subject to erosion and has minimal

Figure 19.—Roads built on micaceous soils are subject to landslides.

load-supporting strength. Unprotected slopes experience extreme erosion, and access roads become impassable.

If a thaw does not affect the entire depth of a frozen soil, an unfrozen, heaved layer of soil is left on top of the frozen soil. Severe erosion can occur if rainwater is unable to penetrate the frozen soil and moves laterally across the surface of frozen material.

Frost heaving exerts considerable force on footings and foundations on susceptible soils. The potential for frost damage must be considered when structures are designed. Frozen soil resists compaction and should not be used as fill material if compacted densities are important. The depth of frost penetration varies with elevation and aspect across the county. North-facing slopes develop frost to a greater depth than other slopes. Frost penetration may exceed a depth of 36 inches in some years at the higher elevations in the county.

Building Site Development

Table 10 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, hardness of bedrock, mica content, stone content, soil texture, and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture, mica content, underlying rock formations, susceptibility to freezing and thawing, and the depth to the water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinking and swelling, high mica content, and unstable underlying rock formations can cause the movement of footings. Depth to a high water table, depth to bedrock, large stones, mica content, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock, the type of bedrock, depth to a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost-action potential, mica content, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, depth to a high water table, depth to bedrock, and the available water capacity in the upper 40 inches affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established. Soil tests are essential to determine liming and fertilizer needs. Help in making soil tests or in deciding what soil additive, if any, should be used can be obtained from the office of the Jackson Soil and Water Conservation District or the local office of the North Carolina Cooperative Extension Service.

Access Roads

Lloyd W. Swift, Jr., research forester, U.S. Forest Service, and Lane Price, district conservationist, and Howard Tew, area engineer, Natural Resources Conservation Service, helped prepare this section.

Establishing access roads in Jackson County has always been a problem, and many abandoned roads scar the slopes and valley bottoms. Sometimes a new

road follows the path of an old one, repeating the errors of the past rather than taking advantage of new technology and experience. Currently, the construction of roads is at an unprecedented level in the mountains. Old roads are reopened by landowners to provide access to woodlots and intermittent farmland. Both old and new roads are opened or built each year for logging on private and government lands. But the largest road construction effort is to give access to second homes and real estate developments. In all of these situations, the common need is for a low-cost, non-polluting, and essentially self-maintaining road design. The trend is away from building, using, and then abandoning a road to building, using, and retaining most roads in a low or intermittent service category.

The U.S. Forest Service has supported research and demonstrations on forest access road design for more than 50 years at the Coweeta Hydrologic Laboratory in the Nantahala Mountains in Macon County. Early work demonstrated methods of stabilization of roadbanks using brush and native grasses or weeds. Through a series of logging demonstrations, a minimum standard intermittent-use road design was developed and tested. Features of this design are:

1. All of the exposed soil is revegetated as construction progresses.
2. Exposure of bare soils is minimized by making vertical cuts and by reducing the width of the roadbed by eliminating the inside ditchline.
3. Soils and geology are identified on maps and construction practices are modified on unstable sites.
4. Siltation of permanent and intermittent streams is minimized by keeping a filter strip of undisturbed soil between the road and stream channel and by crossing channels at right angles, always using bridges, open pipe, or stream crossing fords that have geotextile and gravel.
5. Forest vegetation and brush is cut from the right-of-way and piled below the roadway before construction begins. This brush barrier intercepts sediment-laden storm water or slows its progress downslope.
6. A covering is laid on loose soil in fills to control erosion at critical points, such as stream crossings and dip outlets. Excelsior and burlap sheets or scattered branches, brush, cut weeds, or grasses help to protect the soil until new grass can be established.
7. Surface water is removed from the roadbed by outsloping and broad-based dips. Inside ditchlines are used only when necessary to intercept subsurface flow out of the cutbank. Ditchlines that carry storm water tend to undermine the cutbank, become gullies, and require maintenance.
8. Broad-based dips are short sections of reverse grade that intercept storm water and divert it off the roadbed. Dips are spaced about 200 feet apart and placed to divert water away from stream crossings or steep grades.
9. The maximum grade is held to 8 percent, whenever possible.
10. In areas where gravel is not used on the roadbeds, grass is planted on the entire roadway. Traffic may kill some of the grass, but the rest of the roadbed remains protected from erosion. Gravel is used on the steeper grades, on problem soils, or on heavily travelled sections. Large washed rocks that have a nominal diameter of 3 inches provide an effective pavement to control erosion on less travelled roads. Gravel bonds best to the roadbed if it is placed immediately after construction when the soil is loose.
11. Maintenance requirements for access roads are increased by traffic in winter and early spring, when the soils are wet and soft. Where traffic can be controlled, the only maintenance that is needed is mowing grass and brush annually, supplemented by periodic cleaning of dip outlets. Heavier traffic may require smoothing the roadbed every 5 to 10 years and replacing grass and gravel. Heavy year-round traffic requires that a road be upgraded and receive scheduled maintenance.

Not every user follows these practices. Nevertheless, the road design developed and tested at the Coweeta Hydrologic Laboratory has influenced Federal, State, and forest industry guidelines and has contributed to controlling erosion on access roads and minimizing the impact of sedimentation on landowners who are downslope and on mountain streams. The U.S. Forest Service incorporates features of the design in timber sale contracts and road construction specifications. Elements of the design also appear in North Carolina's Best Management Practice guidelines for reducing nonpoint source pollution. Attachments to the example timber sale contract provided by the North Carolina Forest Service for private landowners and consulting foresters include many of these access road guidelines.

Forest industries early recognized and adopted the concept that a low-cost, intermittent-use road is a permanent and sound economic investment, and they moved away from the cycle of building and rebuilding temporary roads. In 1985, the Soil Conservation Service published a booklet titled "The Layman's Guide to Private Access Road Construction in the Southern Appalachian Mountains." This booklet expands on the approach described here to help homebuilders and developers build usable access roads with minimal environmental impact and cost.

Sanitary Facilities

Table 11 shows the degree and the kind of soil limitations that affect septic tank absorption fields,

sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 11 also shows the suitability of the soils for use as daily cover for landfill. A rating of *good* indicates that soil properties and site features are favorable for the use and that good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, depth to a high water table, depth to bedrock, and flooding affect absorption of the effluent. Large stones and bedrock interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. The animal waste lagoons commonly used in farming operations are not considered in the ratings. They are generally deeper than the lagoons referred to in the table and rely on anaerobic bacteria to decompose waste materials.

Table 11 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, depth to a high water table, depth to bedrock, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope or bedrock can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. Ease of excavation and revegetation should be considered.

The ratings in table 11 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock, depth to a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, and soil reaction affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult

to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 12 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* have more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet and have a water table at a depth of less than 1 foot. These soils have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 12, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale, siltstone, and weathered granite saprolite, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, 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, and toxic material.

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are naturally fertile or respond well to fertilizer and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20

to 40 inches of suitable material, soils that have an appreciable amount of gravel or stones, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel or stones, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and releases a variety of plant nutrients as it decomposes.

Water Management

Table 13 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives the restrictive features that affect each soil for drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area. Ponds that are less than about 2 acres in size are not shown on the soil maps because of the scale of mapping.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth 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 mica. Depth to a high water table affects the amount of usable material. It also affects trafficability.

Soils that have a high content of mica, such as Cashiers, Chandler, and Fannin soils, are poorly suited to the construction of embankments. The problems resulting from the high content of mica include difficulty in compaction, poor trafficability, susceptibility to erosion, and low shear strength. Also, piping commonly is a problem if the soil material is used to impound water.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock or to other layers that affect the rate of water movement, permeability, depth to a high water table or depth of standing water if the soil is subject to ponding, depth to layers of sand, gravel, and cobbles, slope, susceptibility to flooding, and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock, the type of bedrock, large stones, slope, and the hazard of cutbanks caving. Availability of drainage outlets is not considered in the ratings but is a problem on many of the flood plain soils in the county.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock. The performance of a system is affected by the availability of suitable irrigation water, the depth of the root zone, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to help control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock affect the construction of terraces and diversions. Maintenance of terraces and diversions is adversely affected by a restricted rooting depth, a severe hazard of soil blowing or water erosion, an excessively coarse texture, and restricted permeability.

Grassed waterways are natural or constructed

channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock affect the construction of grassed waterways. A hazard of soil blowing, low available water capacity, restricted rooting depth, toxic substances such as very high levels of magnesium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed *(16)*. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics. These results are reported in table 17.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 14 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages, by weight, 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 as much as 15 percent, by volume, 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 *(2)* and the system adopted by the American Association of State Highway and Transportation Officials *(1)*.

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20, or higher, for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 17.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-

weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an 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.

Physical and Chemical Properties

Table 15 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate, or component, consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They influence the ability of the soil to adsorb cations, moisture retention, the 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-bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major 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. A bulk density of more than 1.6 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 refers to the ability of a soil to transmit water or air. The estimates indicate the rate of movement of water through the soil 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 in each major soil layer is stated in inches of water per inch of soil. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time. It is the difference between the amount of soil water at field moisture capacity and the amount at wilting point.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, more than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE)

to predict the average annual rate of soil loss by sheet and rill erosion. Losses are expressed in tons per acre per year. These estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur over a sustained period without affecting crop productivity. The rate is expressed in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to soil blowing in cultivated areas. The groups indicate the susceptibility to soil blowing. Soils are grouped according to the following distinctions:

1. Coarse sands, sands, fine sands, and very fine sands. These soils are generally not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.
2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, and sapric soil material. These soils are very highly erodible. Crops can be grown if intensive measures to control soil blowing are used.
3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control soil blowing are used.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams. These soils are erodible. Crops can be grown if intensive measures to control soil blowing are used.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control soil blowing are used.
5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material. These soils are slightly erodible. Crops can be grown if measures to control soil blowing are used.
6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay. These soils are very slightly erodible. Crops can be grown if ordinary measures to control soil blowing are used.
7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material. These soils are very slightly erodible. Crops can be grown if ordinary measures to control soil blowing are used.
8. Soils that are not subject to soil blowing because of coarse fragments on the surface or because of surface wetness.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 15, 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 or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 16 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils are assigned to one of four groups. They are grouped according to the infiltration of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep or very 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 to very deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

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

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

If a soil listed in table 16 is assigned to two hydrologic groups, the first letter is for drained areas and the second is for undrained areas.

Flooding, the temporary covering of the soil surface by flowing water, is caused by overflowing streams or by runoff from adjacent slopes. Shallow water standing

or flowing for short periods after rainfall or snowmelt is not considered flooding. Standing water in swamps and marshes or in a closed depression is considered ponding.

Table 16 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency 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 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). Duration 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). The time of year that floods are most likely to occur is expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information on flooding is based on evidence in the soil profile, namely strata of water-worn, rounded 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 is local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Data on flooding recorded at the TVA Gaging Stations in the period 1927 to 1972 were used to help assign the frequency of flooding to soils in Jackson County. Information on the extent of flooding based only on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 16 are the depth to the seasonal high water table, the kind of water table, and the months of the year that the water table commonly is highest. A water table that is seasonally high for less than 1 month is not indicated in table 16. An apparent water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.

Two numbers in the column showing depth to the water table indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. "More than 6.0" indicates that the water table is below a depth of 6 feet or that it is within a depth of 6 feet for less than a month.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft, weathered, or hard. If the rock is soft, weathered, or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low, moderate,* or *high.* It is based on soil texture, acidity, and the amount of sulfates in the saturation extract.

Engineering Index Test Data

Table 17 shows laboratory test data for several pedons sampled at carefully selected sites in the survey area. The pedons are typical of the series and are described in the section "Soil Series and Their Morphology." The soil samples were tested by the North Carolina Department of Transportation and Highway Safety, Materials and Test Unit, Raleigh, North Carolina.

The testing methods generally are those of the American Association of State Highway and Transportation Officials (AASHTO) or the American Society for Testing and Materials (ASTM).

The tests and methods are AASHTO classification—M 145 (AASHTO), D 3282 (ASTM); Unified classification—D 2487 (ASTM); Mechanical analysis—T 88 (AASHTO), D 422 (ASTM), D 2217 (ASTM); Liquid limit—T 89 (AASHTO), D 4318 (ASTM); Plasticity index—T 90 (AASHTO), D 4318 (ASTM); and Moisture density—T 99 (AASHTO), D 698 (ASTM).

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(20)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or on laboratory measurements. Table 18 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven 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 Inceptisol.

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 Umbrept (*Umbr*, meaning shade, plus *ept*, from Inceptisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haplumbrepts (*Hapl*, meaning minimal horizonation, plus *umbrepts*, the suborder of the Inceptisols that has an umbric epipedon).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Haplumbrepts.

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 class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, mesic Typic Haplumbrepts.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. There can be some variation in the texture of the surface layer or of the substratum within a series.

Soil Series and Their Morphology

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

Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The location of the typical pedon is described, and coordinates generally are identified by the State plane grid system or by longitude and latitude. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" *(21)*. Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" *(20)*. Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Balsam Series

These soils are very deep, well drained, and moderately rapidly permeable. They formed in colluvium derived from materials weathered from high-grade

metamorphic rocks. They are in coves and gaps. Elevation is generally above 4,800 feet. Slope ranges from 8 to 50 percent. The soils are classified as loamy-skeletal, mixed, frigid Typic Haplumbrepts.

Balsam soils are geographically associated with Tanasee soils. Tanasee soils are coarse-loamy. They are intermingled with areas of the Balsam soils in coves and gaps and generally are in the smoother areas between drainageways.

Typical pedon of Balsam sandy loam, in an area of Tanasee-Balsam complex, 15 to 30 percent slopes, stony; 10 miles northeast of Cullowhee, 1,000 feet northwest of the Richland Balsam Exhibit parking lot on the Blue Ridge Parkway, near the headwaters of Beech Flat Creek Watershed in a stand of red spruce and dead Fraser fir (State plane coordinates 800,000 feet N., 630,000 feet E.):

Oe—2 inches to 0; partly decomposed leaves, twigs, roots, and other coniferous plant material.

A1—0 to 4 inches; black (10YR 2/1) sandy loam; very dark brown (10YR 2/2) dry; weak fine granular structure; very friable; many fine to coarse roots; 20 percent, by volume, rock fragments, mainly stones; few fine flakes of mica; 18 percent organic matter; very strongly acid; clear wavy boundary.

A2—4 to 13 inches; very dark brown (10YR 2/2) sandy loam; weak fine granular structure; very friable; common fine to coarse roots; 20 percent, by volume, rock fragments, mainly stones; few fine flakes of mica; 10 percent organic matter; very strongly acid; clear wavy boundary.

Bw1—13 to 22 inches; dark yellowish brown (10YR 4/4) very cobbly loam; weak medium subangular blocky structure; very friable; common fine to coarse roots; 40 percent, by volume, rock fragments, mainly cobbles; common fine flakes of mica; very strongly acid; gradual wavy boundary.

Bw2—22 to 48 inches; dark yellowish brown (10YR 4/6) very cobbly fine sandy loam; weak medium subangular blocky structure; very friable; few fine roots; 50 percent, by volume, rock fragments, mainly cobbles; common fine flakes of mica; very strongly acid; gradual irregular boundary.

C—48 to 65 inches; dark yellowish brown (10YR 4/6), black (10YR 2/1), and white (10YR 8/2) very cobbly sandy loam; massive; very friable; few fine roots; 55 percent, by volume, rock fragments, mainly cobbles; common fine and medium flakes of mica; common manganese coatings on rock fragments; very strongly acid.

The thickness of the solum ranges from 40 to 72 inches. The depth to bedrock is more than 72 inches. Reaction ranges from extremely acid to moderately acid. The number of mica flakes is few or common. The average content of rock fragments, by volume, in the particle-size control section ranges from 35 to 80 percent. The rock fragments range from gravel to boulders in size. Typically, the amount of rock fragments increases with depth. The content of rock fragments typically is more than 50 percent in the C horizon.

The A horizon has hue of 7.5YR to 2.5Y, value of 2 or 3, and chroma of 0 to 3.

A thin AB horizon occurs in some pedons. It has hue of 7.5YR to 2.5Y, value of 3 or 4, and chroma of 2 to 4. Value and chroma are not both less than 3.5 in the same horizon. The horizon is fine sandy loam, sandy loam, or loam in the fine-earth fraction.

The Bw horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 8. It is fine sandy loam, sandy loam, or loam in the fine-earth fraction.

The BC horizon, if it occurs, has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 8. It is fine sandy loam, sandy loam, coarse sandy loam, or loam in the fine-earth fraction.

The C horizon, if it occurs, is colluvium that varies in color and is fine sandy loam, sandy loam, coarse sandy loam, loamy sand, or loamy coarse sand in the fine-earth fraction.

Biltmore Series

These soils are very deep, well drained or moderately well drained, and rapidly permeable. They formed in sandy recent alluvium. They are on flood plains along large streams. Elevation generally ranges from 1,850 to 2,500 feet. Slope ranges from 0 to 3 percent. The soils are classified as mixed, mesic Typic Udipsamments.

Biltmore soils are geographically associated with Rosman and Statler soils. Rosman soils are coarse-loamy and are in long strips behind the Biltmore soils on the flood plain. Statler soils are fine-loamy. They are on slightly elevated low stream terraces.

Typical pedon of Biltmore sand, 0 to 3 percent slopes, frequently flooded; about 1.1 miles southwest of the intersection of U.S. Highway 441 and the Tuckasegee River at Whittier, 50 feet south of the river, in a strawberry field (State plane coordinates 640,000 feet N., 710,000 feet E.):

Ap—0 to 10 inches; dark brown (10YR 4/3) sand; weak fine granular structure; very friable; common fine and medium roots; few fine flakes of mica; slightly acid; clear smooth boundary.

C1—10 to 27 inches; dark yellowish brown (10YR 4/6) sand; single grained; loose; few fine and medium

roots; common medium flakes of mica; slightly acid; gradual wavy boundary.

C2—27 to 36 inches; yellowish brown (10YR 5/8) loamy sand; single grained; loose; few fine roots; common medium flakes of mica; slightly acid; gradual wavy boundary.

C3—36 to 60 inches; dark yellowish brown (10YR 4/4) sand; single grained; loose; common medium flakes of mica; slightly acid.

The sandy sediment is 40 to 60 inches or more deep over deposits of cobbles and gravel that are stratified with sandy or loamy material. Reaction is strongly acid to slightly acid in unlimed areas. The number of mica flakes is few or common. The content of rock fragments is as much as 10 percent, by volume, to a depth of 40 inches but may be more than 35 percent below a depth of 40 inches.

The Ap or A horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 1 to 6. Where value is 3 and chroma is 1 to 3, the horizon is less than 10 inches thick.

The C horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 8. Mottles with chroma of 2 or less are few or common in some pedons at a depth of 20 to 40 inches. The horizon is dominantly sand, loamy sand, or loamy fine sand. In some pedons, however, it has thin strata of sandy loam or loam less than 6 inches thick.

Braddock Series

These soils are very deep, well drained, and moderately permeable. They formed in old alluvium and colluvium. They are on high stream terraces or colluvial fans. Elevation generally ranges from 1,900 to 2,500 feet. Slope ranges from 2 to 30 percent. The soils are classified as clayey, mixed, mesic Typic Hapludults.

Braddock soils are geographically associated with Dillsboro soils, which are Humic Hapludults and are in slight depressions.

Typical pedon of Braddock clay loam, 2 to 8 percent slopes, eroded; about 350 feet west of the intersection of U.S. Highway 441 and Secondary Road 1406, about 500 feet north of Secondary Road 1406 (State plane coordinates 646,000 feet N., 717,000 feet E.):

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 gravel, by volume; neutral; clear smooth boundary.

Bt1—8 to 18 inches; red (2.5YR 4/8) clay; moderate fine and medium subangular blocky structure; firm, sticky and slightly plastic; 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 and slightly plastic; 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 and slightly plastic; common discontinuous clay films on faces of peds; few fine flakes of mica; few manganese stains; strongly acid; gradual wavy boundary.

BC—52 to 60 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 and slightly plastic; common fine flakes of mica; common manganese stains; strongly acid.

The thickness of the solum ranges from 40 to 60 inches or more. The depth to hard bedrock is more than 60 inches. Reaction is very strongly acid or strongly acid. In limed areas, the upper part of the soil ranges from moderately acid to neutral. The content of water-rounded pebbles and cobbles ranges from 0 to 15 percent, by volume, in the Ap, Bt, BC, and C horizons. The 2C horizon, if it occurs, has 35 to 60 percent, by volume, rock fragments. The number of mica flakes is few or common.

The Ap or A horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6.

The Bt horizon has hue of 10R or 2.5YR, value of 3 to 5, and chroma of 6 to 8. Mottles in shades of yellow or brown range from none to common. The horizon is clay loam or clay.

The BC horizon, if it occurs, has hue of 2.5YR or 5YR, value of 3 to 5, and chroma of 6 to 8. Many pedons are mottled or streaked in shades of red, yellow, or brown. The horizon is loam, sandy clay loam, or clay loam.

Some pedons have a C horizon. This horizon is multicolored alluvium or colluvium. It is sandy loam, fine sandy loam, or loam.

Some pedons have a 2C horizon. This horizon is similar in color and texture to the C horizon. It has 35 to 60 percent, by volume, rock fragments.

Brasstown Series

These soils are deep, well drained, and moderately permeable. They formed in saprolite weathered from metasedimentary rocks. They generally are on

ridgetops and south- to west-facing side slopes. Elevation generally ranges from 1,900 to 3,500 feet. Slope ranges from 15 to 50 percent. The soils are classified as fine-loamy, mixed, mesic Typic Hapludults.

Brasstown soils are geographically associated with Junaluska and Tsali soils. Junaluska soils are moderately deep to weathered bedrock and are intermingled with areas of the Brasstown soils. Tsali soils are shallow to weathered bedrock and are on narrow ridgetops or in areas along stream gorges.

Typical pedon of Brasstown channery fine sandy loam, in an area of Junaluska-Brasstown complex, 30 to 50 percent slopes; about 0.4 mile northeast of Wilmot on Cane Branch, 0.3 mile north of the intersection of Cane Branch and U.S. Highway 441 (State plane coordinates 631,800 feet N., 717,000 feet E.):

Oi—1 inch to 0; partly decomposed leaves, twigs, roots, and other deciduous plant material.

A—0 to 4 inches; dark brown (10YR 4/3) channery fine sandy loam; weak fine granular structure; very friable; common fine to coarse roots; 20 percent, by volume, channers; common fine flakes of mica; strongly acid; clear wavy boundary.

Bt1—4 to 24 inches; yellowish red (5YR 5/6) channery sandy clay loam; weak fine and medium subangular blocky structure; friable; common fine to coarse roots; few discontinuous clay films on faces of peds; 20 percent, by volume, channers; common fine flakes of mica; strongly acid; gradual wavy boundary.

Bt2—24 to 33 inches; yellowish red (5YR 5/8) channery sandy clay loam; weak medium subangular blocky structure; friable; few fine and medium roots; few discontinuous clay films on faces of peds; 25 percent, by volume, channers; common fine flakes of mica; strongly acid; gradual wavy boundary.

Bt3—33 to 45 inches; red (2.5YR 5/8) channery clay loam; moderate fine and medium subangular blocky structure; friable; few fine and medium roots; few discontinuous clay films on faces of peds; 25 percent, by volume, channers; common fine flakes of mica; strongly acid; gradual wavy boundary.

BC—45 to 50 inches; yellowish red (5YR 5/8) channery fine sandy loam; weak fine and medium subangular blocky structure; friable; few fine and medium roots; 25 percent, by volume, channers; common fine flakes of mica; strongly acid; clear irregular boundary.

Cr—50 to 60 inches; multicolored, weathered, fractured metasandstone; few thin seams of yellowish red (5YR 5/8) fine sandy loam in rock fractures.

The thickness of the solum ranges from 30 to 59 inches. The depth to weathered bedrock ranges from 40 to 60 inches. The depth to hard bedrock is more than 60 inches. The content of rock fragments is as much as 35 percent, by volume. Reaction is very strongly acid to moderately acid in unlimed areas. The number of mica flakes is few or common.

The A horizon has hue of 10YR to 5YR, value of 3 to 5, and chroma of 3 to 8. Where value is 3 and chroma is 3 or 4, the horizon is less than 6 inches thick.

The BA horizon, if it occurs, has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8. It is loam, fine sandy loam, or sandy clay loam in the fine-earth fraction.

The Bt horizon has a hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8. It is loam, sandy clay loam, or clay loam in the fine-earth fraction.

The BC horizon, if it occurs, is similar in color to the Bt horizon. It is loam, fine sandy loam, silt loam, or sandy clay loam in the fine-earth fraction.

The C horizon, if it occurs, is multicolored saprolite. It is fine sandy loam, loam, or silt loam in the fine-earth fraction.

The Cr horizon is multicolored, weathered, fractured metasedimentary rock.

Burton Series

These soils are moderately deep, well drained, and moderately rapidly permeable. They formed in saprolite weathered from high-grade metamorphic rocks. They are on ridgetops, head slopes, and side slopes. Elevation is generally above 4,800 feet. Slope ranges from 8 to 95 percent. The soils are classified as coarse-loamy, mixed, frigid Typic Haplumbrepts.

Burton soils are geographically associated with Balsam, Craggey, Tanasee, and Wayah soils. Balsam and Tanasee soils are very deep and are in colluvial areas. Also, Balsam soils are loamy-skeletal. Craggey soils are shallow to hard bedrock and are in narrow, convex areas near areas of rock outcrop. Wayah soils are very deep and are in the broader and smoother areas.

Typical pedon of Burton cobbly sandy loam, in an area of Burton-Craggey-Rock outcrop complex, windswept, 8 to 30 percent slopes, stony; 250 feet southwest from the entrance to Water Rock Knob rest area on the Blue Ridge Parkway (State plane coordinates 647,000 feet N., 767,000 feet E.):

Oi—3 inches to 0; fresh red spruce and Fraser fir needles and yellow birch leaves.

A1—0 to 6 inches; very dark gray (10YR 3/1) cobbly sandy loam; weak fine granular structure; very friable; many fine to coarse roots; 15 percent, by volume, cobbles and 5 percent gravel; few fine

flakes of mica; very strongly acid; clear wavy boundary.

A2—6 to 12 inches; very dark grayish brown (10YR 3/2) cobbly sandy loam; moderate fine and medium granular structure; very friable; common fine and few medium and coarse roots; 15 percent, by volume, cobbles and 5 percent gravel; few fine flakes of mica; very strongly acid; gradual wavy boundary.

Bw—12 to 22 inches; brownish yellow (10YR 6/6) cobbly sandy loam; weak medium subangular blocky structure; very friable; few fine and medium roots; 20 percent, by volume, cobbles and 5 percent gravel; common fine flakes of mica; very strongly acid; gradual wavy boundary.

Cr—22 to 36 inches; weathered, high-grade metamorphic bedrock.

R—36 inches; hard, high-grade metamorphic bedrock.

The thickness of the solum ranges from 20 to 39 inches. The depth to hard bedrock is 20 to 40 inches. The content of rock fragments ranges from 0 to 35 percent, by volume, in the control section. Reaction ranges from extremely acid to moderately acid. The number of mica flakes is few or common.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 to 3. The AB horizon, if it occurs, has hue of 10YR, value of 3 or 4, and chroma of 1 to 3.

The Bw horizon has hue of 10YR, value of 3 to 6, and chroma of 4 to 8. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The BC horizon, if it occurs, is similar in color and texture to the Bw horizon.

The C horizon, if it occurs, is similar in color to the BC horizon. It is saprolite that is commonly sandy loam or loamy sand in the fine-earth fraction.

The Cr horizon, if it occurs, is weathered, high-grade, metamorphic crystalline bedrock.

The R horizon is hard, high-grade, metamorphic bedrock.

Cashiers Series

These soils are very deep, well drained, and moderately rapidly permeable. They are on shaded mountain ridgetops and on head slopes and side slopes that have north to east aspects. They formed in saprolite weathered from high-grade, mica-rich, metamorphic rocks, such as mica gneiss or mica schist. Elevation generally ranges from 2,500 to 4,800 feet. Slope ranges from 8 to 95 percent. The soils are classified as coarse-loamy, micaceous, mesic Umbric Dystrochrepts.

Cashiers soils are geographically associated with Chandler and Fannin soils. The associated soils do not have an umbric epipedon and generally occur on south to west aspects. Also, Fannin soils are redder in color than the Cashiers soils and are fine-loamy.

Typical pedon of Cashiers gravelly fine sandy loam, 30 to 50 percent slopes; 2.2 miles west on U.S. Forest Service Road 1178 from its junction with North Carolina Highway 107, about 500 feet southeast of the road, in a wooded area (State plane coordinates 490,000 feet N., 776,000 feet E.):

Oi—3 inches to 0; partly decomposed leaves, twigs, roots, and other plant material.

A—0 to 9 inches; very dark brown (10YR 2/2) gravelly fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; 20 percent, by volume, gravel; common fine flakes of mica; strongly acid; clear wavy boundary.

Bw1—9 to 33 inches; yellowish brown (10YR 5/8) fine sandy loam; weak fine subangular blocky structure; very friable; common fine and medium roots; 5 percent, by volume, gravel; many fine flakes of mica; strongly acid; gradual wavy boundary.

Bw2—33 to 48 inches; dark yellowish brown (10YR 4/6) fine sandy loam; weak fine subangular blocky structure; very friable; few fine and medium roots; 10 percent, by volume, gravel; many fine flakes of mica; very strongly acid; gradual wavy boundary.

BC—48 to 65 inches; dark yellowish brown (10YR 4/6) gravelly sandy loam; weak fine subangular blocky structure; very friable; 20 percent, by volume, gravel; many fine to coarse flakes of mica; very strongly acid.

The thickness of the solum ranges from 30 to 60 inches or more. The depth to hard bedrock is more than 60 inches. Reaction ranges from very strongly acid to moderately acid in unlimed areas. The content of mica flakes is common or many in the surface layer and many in the other horizons. The content of rock fragments is as much as 35 percent, by volume, in the 10- to 40-inch control section.

The A or Ap horizon has hue of 7.5YR to 2.5Y, value of 2 or 3, and chroma of 1 to 3.

The Bw horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 8. It is loam, sandy loam, or fine sandy loam in the fine-earth fraction.

The BC horizon, if it occurs, is similar in color to the Bw horizon. It is loam, fine sandy loam, or sandy loam in the fine-earth fraction.

The C horizon, if it occurs, is multicolored saprolite weathered from high-grade metamorphic rocks, such as mica gneiss and mica schist. It is loamy sand, loamy fine sand, sandy loam, or fine sandy loam in the fine earth-fraction.

Chandler Series

These soils are very deep, somewhat excessively drained, and moderately rapidly permeable. They are on ridgetops and side slopes that have south to west aspects. They formed in saprolite weathered from high-grade, mica-rich, metamorphic rocks, such as mica gneiss or mica schist. Elevation generally ranges from 2,500 to 4,800 feet. Slope ranges from 8 to 95 percent. The soils are classified as coarse-loamy, micaceous, mesic Typic Dystrochrepts.

Chandler soils are geographically associated with Cashiers and Fannin soils. Cashiers soils have an umbric epipedon and are generally on north- to east-facing side slopes. Fannin soils are redder in color than the Chandler soils. They have an argillic horizon and are fine-loamy. They generally occur on spur ridges and in the smoother areas of side slopes.

Typical pedon of Chandler gravelly fine sandy loam, 8 to 15 percent slopes; about 1.8 miles northwest of U.S. Highway 64 and Lupton Lake, 0.75 mile northwest of Zacharys Gap, on Big Ridge Quadrangle (State plane coordinates 534,000 feet N., 778,000 feet E.):

Oi—2 inches to 0; partly decomposed leaves, twigs, roots, and other deciduous and coniferous plant material.

A1—0 to 4 inches; very dark grayish brown (10YR 3/2) gravelly fine sandy loam; weak fine and medium granular structure; very friable; many fine roots; 15 percent, by volume, gravel and 5 percent, by volume, cobbles; common fine and medium flakes of mica; strongly acid; clear wavy boundary.

A2—4 to 7 inches; dark yellowish brown (10YR 4/4) gravelly fine sandy loam; moderate fine granular structure; very friable; common fine roots; 15 percent, by volume, gravel and 5 percent, by volume, cobbles; many fine and medium flakes of mica; strongly acid; clear wavy boundary.

Bw1—7 to 20 inches; yellowish brown (10YR 5/6) fine sandy loam; weak fine subangular blocky structure; very friable; common fine roots; 5 percent, by volume, gravel; many fine and medium flakes of mica; very strongly acid; gradual wavy boundary.

Bw2—20 to 25 inches; yellowish brown (10YR 5/6) fine sandy loam; weak fine subangular blocky structure; very friable; few fine roots; 10 percent, by volume, gravel; many fine and medium flakes of mica; very strongly acid; gradual wavy boundary.

C—25 to 99 inches; multicolored, micaceous fine sandy loam that weathered from saprolite; massive; very friable; few fine roots; 10 percent, by volume, gravel; many fine to coarse flakes of mica; very strongly acid.

The thickness of the solum is 20 to 40 inches. The depth to hard bedrock is more than 72 inches. Reaction is very strongly acid to moderately acid in unlimed areas. The number of mica flakes ranges from few to many in the surface layer and is many in the other horizons. The content of rock fragments ranges from 15 to 35 percent, by volume, in the A horizon and is as much as 35 percent in the Bw and C horizons.

The A or Ap horizon has hue of 10YR or 7.5YR, value of 2 to 5, and chroma of 0 to 4. Where value and chroma are 3 or less, the horizon is less than 7 inches thick.

The Bw horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 8. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The C horizon is multicolored, micaceous saprolite. It is loam, sandy loam, or fine sandy loam in the fine-earth fraction.

Cheoah Series

These soils are deep, well drained, and moderately rapidly permeable. They formed in saprolite weathered from metasedimentary rocks. They generally are on north- to east-facing side slopes. Elevation generally ranges from 3,500 to 4,800 feet. Slope ranges from 30 to 95 percent. The soils are classified as coarse-loamy, mixed, mesic Typic Haplumbrepts.

Cheoah soils are geographically associated with Soco and Stecoah soils. The associated soils have an ochric epipedon and generally occur on south- to west-facing side slopes. Also, Soco soils are moderately deep to weathered bedrock.

Typical pedon of Cheoah channery loam, 50 to 95 percent slopes; 250 feet northwest of the north entrance to Big Witch Tunnel on the Blue Ridge Parkway (State plane coordinates 671,000 feet N., 746,000 feet E.):

Oi—2 inches to 0; partly decomposed leaves, twigs, roots, and other deciduous plant material.

A—0 to 11 inches; very dark grayish brown (10YR 3/2) channery loam; weak fine granular structure; very friable; many fine to coarse roots; 15 percent, by volume, channers and 5 percent, by volume, flagstones; few fine flakes of mica; very strongly acid; clear smooth boundary.

AB—11 to 15 inches; dark yellowish brown (10YR 4/4) channery loam; weak medium granular structure; very friable; common fine to coarse roots; 15 percent, by volume, channers and 5 percent, by volume, flagstones; few fine and medium flakes of mica; very strongly acid; clear wavy boundary.

Bw1—15 to 22 inches; yellowish brown (10YR 5/8) channery loam; weak medium subangular blocky structure; friable; few fine and medium roots; 20

percent, by volume, channers; common fine flakes of mica; strongly acid; gradual wavy boundary.

Bw2—22 to 32 inches; strong brown (7.5YR 5/6) channery loam; weak medium subangular blocky structure; friable; few fine and medium roots; 20 percent, by volume, channers; common fine flakes of mica; strongly acid; gradual wavy boundary.

BC—32 to 39 inches; strong brown (7.5YR 5/6) channery fine sandy loam; weak medium subangular blocky structure; friable; few medium roots; 25 percent, by volume, channers; common fine flakes of mica; strongly acid; gradual wavy boundary.

C—39 to 56 inches; multicolored channery fine sandy loam that weathered from saprolite; massive; very friable; 25 percent, by volume, channers; common fine flakes of mica; strongly acid; gradual wavy boundary.

Cr—56 to 60 inches; multicolored, weathered, interbedded metasandstone and phyllite; massive; black (10YR 2/1) manganese coatings along fractures.

The thickness of the solum ranges from 30 to 59 inches. The depth to weathered, fractured bedrock is 40 to 60 inches. The depth to hard bedrock is more than 60 inches. Reaction ranges from extremely acid to strongly acid in the A horizon and from very strongly acid to moderately acid in the other horizons. The number of mica flakes is few or common. The content of rock fragments ranges from 5 to 35 percent, by volume, in the 10- to 40-inch control section.

The A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 to 3.

Some pedons have a thin AB horizon. This horizon has hue of 10YR and value and chroma of 3 or 4. It is fine sandy loam or loam in the fine-earth fraction.

The Bw horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 8. It is sandy loam, fine sandy loam, loam, or silt loam in the fine earth-fraction.

The BC horizon, if it occurs, is similar in color and texture to the Bw horizon.

The C horizon, if it occurs, is multicolored saprolite weathered from metasedimentary rocks, such as thinly bedded sandstone and phyllite. It is sandy loam, fine sandy loam, or silt loam in the fine-earth fraction.

The Cr horizon is multicolored, weathered metasandstone and phyllite.

Chestnut Series

These soils are moderately deep, well drained, and moderately rapidly permeable. They formed in saprolite weathered from high-grade metamorphic rocks. They generally are on ridgetops and south- to west-facing side slopes. Elevation generally ranges from 3,500 to 4,800 feet. Slope ranges from 8 to 95 percent. The soils are classified as coarse-loamy, mixed, mesic Typic Dystrochrepts.

Chestnut soils are geographically associated with Edneyville, Plott, and Cleveland soils. Edneyville and Plott soils are very deep to weathered bedrock and are on the smoother parts of the landscape. Also, Plott soils are on north- to east-facing slopes and have an umbric epipedon. Cleveland soils are loamy and shallow to hard bedrock. They occur near areas of rock outcrop.

Typical pedon of Chestnut gravelly fine sandy loam, in an area of Edneyville-Chestnut complex, 30 to 50 percent slopes, stony; about 4.3 miles east of the intersection of North Carolina Highway 281 and Secondary Road 1760, about 0.6 mile south of Secondary Road 1760 on Charlie Creek Road, 500 feet south of the dam on Meade Lake (State plane coordinates 574,100 feet N., 811,350 feet E.):

Oi—1 inch to 0; partly decomposed leaves, twigs, roots, and other deciduous plant material.

A—0 to 3 inches; dark yellowish brown (10YR 4/4) gravelly fine sandy loam; weak fine granular structure; very friable; common fine roots; 15 percent, by volume, gravel and 5 percent, by volume, cobbles; few fine flakes of mica; very strongly acid; clear wavy boundary.

Bw—3 to 15 inches; strong brown (7.5YR 5/6) fine sandy loam; weak medium subangular blocky structure; very friable; few fine roots; 5 percent, by volume, gravel; common fine and medium flakes of mica; very strongly acid; gradual wavy boundary.

C—15 to 28 inches; strong brown (7.5YR 5/6) gravelly sandy loam that weathered from saprolite; streaks of white (10YR 8/2) feldspar and black (10YR 2/1) manganese on faces of peds; massive; very friable; few fine roots; 15 percent, by volume, gravel and 5 percent, by volume, cobbles; common fine and medium flakes of mica; very strongly acid; gradual wavy boundary.

Cr—28 to 60 inches; multicolored, weathered gneiss bedrock.

The thickness of the solum ranges from 15 to 39 inches. The depth to weathered, high-grade metamorphic crystalline bedrock is 20 to 40 inches. The depth to hard bedrock is more than 40 inches. Reaction is very strongly acid to moderately acid in unlimed areas. The number of mica flakes is few or common. The content of rock fragments ranges from 0 to 35 percent, by volume, in the 10- to 40-inch control section.

The A or Ap horizon has hue of 7.5YR to 2.5Y, value of 2 to 6, and chroma of 1 to 6. Where value is 2 or 3

and chroma is 1 to 3, the horizon is less than 7 inches thick.

The Bw horizon has hue of 7.5YR to 2.5Y, value of 4 to 6 and chroma of 3 to 8. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The C horizon, if it occurs, is strong brown or multicolored saprolite weathered from high-grade metamorphic rocks. It is loamy sand, sandy loam, or fine sandy loam in the fine earth-fraction.

The Cr horizon is multicolored, weathered, high-grade metamorphic rock, such as mica gneiss or hornblende gneiss.

Cleveland Series

These soils are shallow, somewhat excessively drained, and moderately rapidly permeable. They formed in saprolite weathered from high-grade metamorphic rocks. They are on ridgetops, head slopes, and side slopes. Elevation generally ranges from 2,500 to 4,800 feet. Slope ranges from 15 to 95 percent. The soils are classified as loamy, mixed, mesic Lithic Dystrochrepts.

Cleveland soils are geographically associated with Chestnut soils and areas of rock outcrop. Chestnut soils are moderately deep and are in concave areas and on the lower slopes. Areas of rock outcrop occur on cliffs or head slopes and are commonly adjacent to the Cleveland soils.

Typical pedon of Cleveland sandy loam, in an area of Cleveland-Chestnut-Rock outcrop complex, windswept, 15 to 30 percent slopes; about 1.0 mile southeast of Cowee Gap, 2.7 miles northeast of Bearpen Mountain, 0.25 mile southwest of the top of Whiteside Mountain, 1,500 feet east of the Macon County line (State plane coordinates 512,400 feet N., 764,000 feet E.):

Oi—2 inches to 0; partly decomposed leaves, twigs, roots, and other deciduous plant material.

A—0 to 5 inches; black (10YR 2/1) sandy loam; weak fine and medium granular structure; very friable; many fine to coarse roots; 5 percent, by volume, gravel and 5 percent, by volume, cobbles; few fine flakes of mica; very strongly acid; clear wavy boundary.

Bw—5 to 17 inches; yellowish brown (10YR 5/8) loam; weak medium subangular blocky structure; very friable; common fine to coarse roots; 10 percent, by volume, gravel; few fine flakes of mica; strongly acid; abrupt wavy boundary.

R—17 inches; hard granodiorite bedrock.

The thickness of the solum ranges from 10 to 19 inches. The depth to hard, high-grade metamorphic bedrock is 10 to 20 inches. Reaction ranges from very strongly acid to moderately acid. The number of mica flakes is few or common. The content of rock fragments ranges from 0 to 35 percent, by volume.

The A horizon has hue of 10YR or 7.5YR, value of 2 to 5, and chroma of 1 to 4. Where value is 2 or 3 and chroma is 1 to 3, the horizon is less than 7 inches thick.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The R horizon is high-grade metamorphic bedrock.

Cowee Series

These soils are moderately deep, well drained, and moderately permeable. They formed in saprolite weathered from high-grade metamorphic rocks. They are generally on ridgetops and south- to west-facing side slopes. Elevation generally ranges from 2,000 to 3,500 feet. Slope ranges from 8 to 95 percent. The soils are classified as fine-loamy, mixed, mesic Typic Hapludults.

Cowee soils are geographically associated with Evard and Trimont soils. The associated soils are very deep to weathered bedrock. Trimont soils have a darker surface layer than that of the Cowee soils and are generally on north- to east-facing side slopes. Evard soils are intermingled with areas of the Cowee soils.

Typical pedon of Cowee gravelly sandy loam, in an area of Evard-Cowee complex, 15 to 30 percent slopes; about 1.1 miles northeast of Cullowhee from the Tuckasegee River on Secondary Road 1002, about 0.8 mile north of Black Mountain Church, 0.2 mile north on a U.S. Forest Service access road and 250 feet west on a U.S. Forest Service trail, 25 feet north of the trail (State plane coordinates 609,000 feet N., 768,000 feet E.):

Oi—2 inches to 0; partly decomposed leaves, twigs, roots, and other deciduous plant material.

A—0 to 5 inches; reddish brown (5YR 4/4) gravelly sandy loam; weak fine granular structure; very friable; many fine and medium roots; 20 percent, by volume, gneiss gravel; common fine and medium flakes of mica; strongly acid; clear wavy boundary.

Bt1—5 to 13 inches; red (2.5YR 4/8) gravelly sandy loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; common fine roots; common faint clay films on faces of peds; 20 percent, by volume, gneiss gravel; common fine and medium flakes of mica; strongly acid; gradual wavy boundary.

Bt2—13 to 27 inches; red (2.5YR 5/8) gravelly sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; common faint clay films on faces of

peds; 30 percent, by volume, gneiss gravel; common fine and medium flakes of mica; strongly acid; abrupt wavy boundary.
Cr—27 to 60 inches; multicolored, weathered hornblende gneiss; partly consolidated but can be dug with difficulty by a spade.

The thickness of the solum is 20 to 39 inches. The depth to weathered bedrock is 20 to 40 inches, and the depth to hard bedrock is more than 40 inches. Reaction is very strongly acid to moderately acid in unlimed areas. The number of mica flakes is few or common. The content of rock fragments ranges from 0 to 35 percent, by volume.

The A or Ap horizon has hue of 5YR to 10YR, value of 3 to 5, and chroma of 2 to 8. Where value is 3 and chroma is 3 or 4, the horizon is less than 6 inches thick.

Some pedons have a BA horizon. This horizon has hue of 5YR or 7.5YR, value of 4 to 6, and chroma of 4 to 8. It is loam, fine sandy loam, or sandy loam in the fine-earth fraction.

The Bt horizon has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8. It is sandy loam, loam, sandy clay loam, or clay loam in the fine-earth fraction.

The BC horizon, if it occurs, is similar in color to the Bt horizon. It is loam, fine sandy loam, or sandy loam in the fine-earth fraction.

The C horizon, if it occurs, is similar in color to the BC horizon or is multicolored. In the fine-earth fraction, it is sandy loam, fine sandy loam, or loam that weathered from saprolite.

The Cr horizon is multicolored, weathered, high-grade metamorphic bedrock. It is partly consolidated but can be dug with difficulty by a spade.

Craggey Series

These soils are shallow, somewhat excessively drained, and moderately rapidly permeable. They formed in saprolite weathered from high-grade metamorphic rocks. They are on ridgetops, head slopes, and side slopes. Elevation is generally above 4,800 feet. Slope ranges from 15 to 95 percent. The soils are classified as loamy, mixed, frigid Lithic Haplumbrepts.

Craggey soils are geographically associated with Burton and Wayah soils. Burton soils are moderately deep to hard bedrock and are intermingled with areas of the Craggey soils. Wayah soils are very deep to hard bedrock and are in the smoother areas away from areas of rock outcrop.

Typical pedon of Craggey cobbly sandy loam, in an area of Burton-Craggey-Rock outcrop complex, windswept, 30 to 95 percent slopes, stony; 300 feet north of Water Rock Knob rest area on the Blue Ridge Parkway near the Jackson-Haywood County line (State plane coordinates 649,000 feet N., 768,000 feet E.):

Oi—2 inches to 0; partly decomposed leaves, twigs, roots, and other deciduous and coniferous plant material.
A1—0 to 6 inches; black (10YR 2/1) cobbly sandy loam; weak fine and medium granular structure; very friable; many fine to coarse roots; 15 percent, by volume, cobbles, 5 percent, by volume, gravel, and 5 percent, by volume, stones; common fine flakes of mica; very strongly acid; clear smooth boundary.
A2—6 to 12 inches; very dark gray (10YR 3/1) cobbly sandy loam; weak fine and medium granular structure; very friable; common fine and few medium and coarse roots; 15 percent, by volume, cobbles, 5 percent, by volume, gravel, and 5 percent, by volume, stones; few fine flakes of mica; strongly acid; clear wavy boundary.
A3—12 to 16 inches; dark brown (10YR 3/3) cobbly sandy loam; weak medium granular structure; very friable; few medium and coarse roots; 15 percent, by volume, cobbles and 5 percent, by volume, stones; few fine flakes of mica; strongly acid; abrupt wavy boundary.
R—16 inches; hard hornblende gneiss bedrock.

The thickness of the solum ranges from 10 to 19 inches. The depth to hard, high-grade metamorphic bedrock is 10 to 20 inches. Reaction ranges from extremely acid to moderately acid. The number of mica flakes is few or common. The content of rock fragments is as much as 35 percent, by volume.

The A horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 to 3.

The R horizon is hard, high-grade metamorphic bedrock.

Cullasaja Series

These soils are very deep, well drained, and moderately rapidly permeable. They formed in colluvium derived from high-grade metamorphic rocks. They are on toe slopes and benches and along drainageways in coves. Elevation generally ranges from 3,500 to 4,800 feet. Slope ranges from 8 to 90 percent. The soils are classified as loamy-skeletal, mixed, mesic Typic Haplumbrepts.

Cullasaja soils are geographically associated with Tuckasegee soils, which are fine-loamy and are intermingled with areas of the Cullasaja soils in coves and on benches and toe slopes.

Typical pedon of Cullasaja very cobbly fine sandy loam, in an area of Cullasaja-Tuckasegee complex, 15 to 30 percent slopes, stony; about 3.5 miles northwest

of the intersection of U.S. Highway 64 and North Carolina Highway 107 in Cashiers, 1.8 miles west on Secondary Road 1152 from its intersection with Secondary Road 1149, about 0.25 mile west on a logging road (State plane coordinates 544,300 feet N., 745,300 feet E.):

Oi—2 inches to 0; partly decomposed leaves, twigs, roots, and other deciduous plant material.

A1—0 to 5 inches; black (10YR 2/1) very cobbly fine sandy loam; weak medium granular structure; very friable; many fine to coarse roots; 15 percent, by volume, gravel, 30 percent, by volume, cobbles, and 5 percent, by volume, stones; few fine flakes of mica; very strongly acid; clear smooth boundary.

A2—5 to 13 inches; very dark brown (10YR 2/2) very cobbly fine sandy loam; weak medium granular structure; very friable; many fine to coarse roots; 15 percent, by volume, gravel, 30 percent, by volume, cobbles, and 5 percent, by volume, stones; few fine flakes of mica; very strongly acid; clear wavy boundary.

Bw1—13 to 26 inches; dark yellowish brown (10YR 4/4) very cobbly fine sandy loam; weak fine and medium subangular blocky structure; very friable; common medium to coarse roots; 10 percent, by volume, gravel, 30 percent, by volume, cobbles, and 15 percent, by volume, stones; few fine flakes of mica; very strongly acid; clear wavy boundary.

Bw2—26 to 38 inches; yellowish brown (10YR 5/6) very cobbly sandy loam; weak medium subangular blocky structure; very friable; few fine roots; 10 percent, by volume, gravel, 30 percent, by volume, cobbles, and 15 percent, by volume, stones; few fine flakes of mica; very strongly acid; gradual wavy boundary.

BC—38 to 60 inches; dark yellowish brown (10YR 4/6) extremely cobbly sandy loam; weak fine subangular blocky structure; very friable; few medium and coarse roots; 15 percent, by volume, gravel, 30 percent, by volume, cobbles, and 20 percent, by volume, stones; few fine flakes of mica; very strongly acid.

The thickness of the solum ranges 30 to more than 60 inches. The depth to hard bedrock is more than 72 inches. Reaction ranges from very strongly acid to slightly acid in the A horizon in unlimed areas. It ranges from very strongly acid to moderately acid in the Bw horizon and the lower horizons. The number of mica flakes is few or common. The content of rock fragments ranges from 35 to 80 percent, by volume, and from gravel to boulders in size in the control section.

The A or Ap horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 to 3.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 8. It is sandy loam, fine sandy loam, loam, or sandy clay loam in the fine-earth fraction.

The BC horizon, if it occurs, has hue of 7.5YR or 10YR, value of 3 to 6, and chroma of 4 to 8. It is sandy loam, coarse sandy loam, loamy fine sand, or loamy sand in the fine-earth fraction.

The C horizon, if it occurs, is colluvium that is multicolored or similar in color to the BC horizon. It is sandy loam, coarse sandy loam, loamy fine sand, loamy sand, or loamy coarse sand in the fine-earth fraction.

Cullowhee Series

These soils are moderately deep to strata of sand, gravel, and cobbles and very deep to bedrock. They are somewhat poorly drained. They are moderately rapidly permeable in the A horizon and rapidly permeable in the C horizon. They formed in recent alluvium derived from high-grade metamorphic or metasedimentary rocks. They are on narrow flood plains along small streams. Elevation generally ranges from 1,850 to 3,000 feet. Slope ranges from 0 to 2 percent. The soils are classified as coarse-loamy over sandy or sandy-skeletal, mixed, mesic Aquic Haplumbrepts.

Cullowhee soils are geographically associated with Dellwood, Nikwasi, and Reddies soils. Dellwood soils are moderately well drained and are shallow to strata of sand, gravel, or cobbles. They have more than 35 percent rock fragments in the 10- to 40-inch control section. Nikwasi soils are poorly drained or very poorly drained. They are in depressions near the uplands. Reddies soils are moderately well drained. They are in slightly elevated areas.

Typical pedon of Cullowhee fine sandy loam, 0 to 2 percent slopes, occasionally flooded; about 2 miles south on Secondary Road 1001 from its intersection with North Carolina Highway 107, northwest on a farm path just before crossing Cullowhee Creek, 50 feet north of the path, in a hay field (State plane coordinates 638,000 feet N., 704,000 feet E.):

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; common fine flakes of mica; moderately acid; clear wavy boundary.

A—8 to 13 inches; dark brown (10YR 3/3) fine sandy loam; common medium faint dark brown (7.5YR 3/4) mottles; moderate fine granular structure; very friable; common fine and medium roots; common fine flakes of mica; few thin lenses of loamy sand; moderately acid; clear wavy boundary.

AC—13 to 19 inches; dark yellowish brown (10YR 3/4)

loamy sand; few fine distinct strong brown (7.5YR 5/6) mottles; massive; very friable; common fine flakes of mica; few manganese concretions; moderately acid; clear wavy boundary.

C—19 to 23 inches; dark yellowish brown (10YR 4/4) loamy sand; common medium distinct strong brown (7.5YR 5/6) and grayish brown (10YR 5/2) mottles; massive; very friable; common fine flakes of mica; few manganese concretions; moderately acid; clear wavy boundary.

Ab—23 to 35 inches; black (10YR 2/1) loamy fine sand; few medium prominent yellowish red (5YR 4/6) and common medium distinct grayish brown (10YR 5/2) mottles; massive; very friable; common fine flakes of mica; moderately acid; clear wavy boundary.

C′—35 to 65 inches; multicolored extremely gravelly sand; single grained; loose; 70 percent, by volume, dominantly waterworn gravel and many cobbles; common fine flakes of mica; slightly acid.

The thickness of the solum ranges from 15 to 35 inches. A sandy C horizon that contains more than 35 percent, by volume, rock fragments is within a depth of 20 to 40 inches. The depth to bedrock is more than 60 inches. Reaction is very strongly acid to slightly acid. The number of mica flakes is few or common. Rock fragments, mainly gravel or cobbles, range from 0 to 15 percent, by volume, in the Ap, A, or AC horizons and from 35 to 80 percent in the lower layers.

The Ap or A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 to 3.

The AC horizon, if it occurs, has hue of 10YR, value of 2 or 3, and chroma of 1 to 4. It is sand, loamy fine sand, or loamy sand in the fine-earth fraction.

Most pedons have an Ab horizon. This horizon is similar in color and texture to the AC horizon.

The Bw horizon, if it occurs, has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 3 to 6. It is mottled in chroma of 2 or less within 20 inches of the surface. It is loam, fine sandy loam, or sandy loam in the fine-earth fraction. Some pedons have a Bg horizon below a depth of 20 inches that has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2. This horizon has the same textures as the Bw horizon. The Bg horizon, if it occurs, is not immediately below the umbric epipedon.

The C or C′ horizon, if it occurs, is similar in color to the Bw horizon. If it is immediately below the umbric epipedon, mottles with chroma of 2 or less are within 20 inches of the surface. Some pedons have a Cg horizon below a depth of 20 inches. The Cg horizon, if it occurs, is similar in color to the Bg horizon. The upper part of the C and Cg horizons is dominantly sand, coarse sand, loamy sand, or loamy fine sand but ranges to sandy loam, fine sandy loam, and loam. Within a depth of 20 to 40 inches, the C and Cg horizons are sand, loamy sand, coarse sand, or loamy coarse sand in the fine-earth fraction and contain more than 35 percent, by volume, rock fragments.

Dellwood Series

These soils are shallow to strata of sand, gravel, and cobbles and very deep to bedrock. They are moderately well drained. They are moderately rapidly permeable in the surface layer and very rapidly permeable in the lower layers. They formed in recent alluvium derived from high-grade metamorphic or metasedimentary rocks. They are on narrow flood plains along high-energy streams. Elevation generally ranges from 1,850 to 3,000 feet. Slope ranges from 0 to 3 percent. The soils are classified as sandy-skeletal, mixed, mesic Fluventic Haplumbrepts.

Dellwood soils are geographically associated with Cullowhee, Nikwasi, and Reddies soils. The associated soils are moderately deep to strata of sand, gravel, and cobbles. Cullowhee soils are somewhat poorly drained and are in slight depressions. Nikwasi soils are poorly drained or very poorly drained and are in depressions near the uplands. Reddies soils are in slightly elevated areas.

Typical pedon of Dellwood gravelly fine sandy loam, 0 to 3 percent slopes, occasionally flooded; about 3.25 miles north of Tuckasegee at the intersection of North Carolina Highways 107 and 281, about 0.1 mile north of Moses Creek Church, 500 feet northwest of Stephens Cemetery (State plane coordinates 592,000 feet N., 780,000 feet E.):

Ap—0 to 8 inches; dark brown (10YR 3/3) gravelly fine sandy loam; weak fine and medium granular structure; very friable; many fine and medium roots; 15 percent, by volume, gravel and 5 percent, by volume, cobbles; common fine and medium flakes of mica; slightly acid; clear wavy boundary.

A—8 to 16 inches; dark brown (10YR 3/3) cobbly sandy loam; weak fine and medium granular structure; very friable; many fine and medium roots; 5 percent, by volume, gravel and 20 percent, by volume, cobbles; common fine and medium flakes of mica; moderately acid; gradual wavy boundary.

C—16 to 60 inches; strong brown (7.5YR 4/6) very cobbly loamy sand; massive; loose; 20 percent, by volume, gravel and 35 percent, by volume, cobbles; common fine and medium flakes of mica; moderately acid.

The thickness of the solum and the depth to coarse textured material that contains more than 35 percent, by volume, rounded gravel and cobbles are 10 to 20

inches. The depth to bedrock is more than 60 inches. Reaction is very strongly acid to neutral. The number of mica flakes is few or common.

The Ap or A horizon has hue of 7.5YR or 10YR, value of 3, and chroma of 1 to 3.

The C horizon is strong brown or multicolored alluvium derived from high-grade metamorphic crystalline or metasedimentary rocks. It is loamy sand, sand, coarse sand, or loamy coarse sand in the fine-earth fraction. It averages more than 35 percent, by volume, rock fragments.

Dillard Series

These soils are very deep, moderately well drained, and moderately permeable. They formed in old alluvium. They are on stream terraces. Elevation generally ranges from 1,850 to 2,500 feet. Slope ranges from 1 to 5 percent. The soils are classified as fine-loamy, mixed, mesic Aquic Hapludults.

Dillard soils are geographically associated with Hemphill and Statler soils. Hemphill soils are fine textured and very poorly drained and are in depressions. Statler soils are well drained and are in slightly elevated areas.

Typical pedon of Dillard loam, 1 to 5 percent slopes, rarely flooded; about 2.0 miles southeast of Cherokee on U.S. Highway 441, about 1,000 feet southeast of the intersection of Secondary Road 1406 and U.S. Highway 441 (State plane coordinates 646,000 feet N., 708,000 feet E.):

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) loam; moderate fine and medium granular structure; very friable; common fine and medium roots; few fine flakes of mica; slightly acid; clear smooth boundary.

Bt1—9 to 20 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; few fine and medium roots; few discontinuous clay films on faces of peds; few fine flakes of mica; moderately acid; gradual wavy boundary.

Bt2—20 to 30 inches; brownish yellow (10YR 6/6) loam; common medium distinct light gray (10YR 6/1) and red (2.5YR 4/8) mottles; weak medium subangular blocky structure; friable; few discontinuous clay films on faces of peds; few fine flakes of mica; moderately acid; gradual wavy boundary.

Bt3—30 to 37 inches; brownish yellow (10YR 6/6) loam; common medium distinct light gray (10YR 6/1) mottles; weak medium subangular blocky structure; friable; few discontinuous clay films on faces of peds; common fine flakes of mica; strongly acid; gradual wavy boundary.

Btg—37 to 42 inches; light gray (10YR 6/1) clay loam; common medium distinct yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; firm; few discontinuous clay films on faces of peds; common fine flakes of mica; strongly acid; gradual wavy boundary.

BCg—42 to 70 inches; light gray (10YR 7/2) clay loam; many medium distinct yellowish red (5YR 5/8) and strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; common fine flakes of mica; strongly acid.

The thickness of the solum ranges from 30 to 60 inches or more. Reaction ranges from strongly acid to moderately acid in the A horizon in unlimed areas and from very strongly acid to moderately acid in the other horizons. The number of mica flakes is few or common. The content of rock fragments is less than 15 percent, by volume.

The Ap or A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 to 4. Where value is 3 and chroma is 1 to 3, the horizon is less than 10 inches thick.

The Bt horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 8. The lower part of some Bt horizons has gray mottles. The horizon is loam, sandy clay loam, or clay loam in the fine-earth fraction.

The Btg horizon, if it occurs, has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2 and is mottled in shades of brown, yellow, or red. It is clay loam, sandy clay loam, or loam in the fine-earth fraction.

The BCg horizon, if it occurs, has hue of 10YR to 5Y, value of 6 or 7, and chroma of 1 or 2 or is mottled in shades of brown, yellow, or red. It is loam, sandy clay loam, or clay loam in the fine-earth fraction.

The Cg horizon, if it occurs, is alluvium that is similar in color to the BCg horizon. It is sand, loamy sand, sandy loam, loam, sandy clay loam, or clay loam in the fine-earth fraction.

Dillsboro Series

These soils are very deep, well drained, and moderately permeable. They formed in old alluvium. They are on high stream terraces. Elevation generally ranges from 1,850 to 2,500 feet. Slope ranges from 2 to 15 percent. The soils are classified as clayey, mixed, mesic Humic Hapludults.

Dillsboro soils are geographically associated with Braddock soils, which have a red subsoil and are in eroded, convex areas of high stream terraces.

Typical pedon of Dillsboro loam, 2 to 8 percent slopes; about 1.0 mile southwest of Webster on North Carolina Highway 116, about 0.25 mile south of the

highway, in a hay field (State plane coordinates 604,000 feet N., 738,000 feet E.):

Ap—0 to 10 inches; dark reddish brown (5YR 3/3) loam; moderate medium granular structure; very friable; many fine and medium roots; few fine flakes of mica; moderately acid; clear smooth boundary.

Bt1—10 to 15 inches; yellowish red (5YR 4/6) clay loam; weak medium subangular blocky structure; friable; few fine and medium roots; few faint clay films on faces of peds; few fine flakes of mica; slightly acid; gradual smooth boundary.

Bt2—15 to 33 inches; yellowish red (5YR 4/6) clay; moderate medium subangular blocky structure; friable; few fine and medium roots; few faint clay films on faces of peds; 4 percent, by volume, cobbles and 4 percent, by volume, gravel; few fine flakes of mica; slightly acid; diffuse smooth boundary.

Bt3—33 to 43 inches; yellowish red (5YR 5/6) clay; moderate medium subangular blocky structure; friable; few fine roots; few faint clay films on faces of peds; 6 percent, by volume, gravel and 5 percent, by volume, cobbles; few fine flakes of mica; strongly acid; gradual wavy boundary.

2Bt4—43 to 59 inches; strong brown (7.5YR 5/6) very cobbly clay; common fine distinct yellowish red (5YR 5/8) and strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable; few faint clay films on faces of peds; common manganese nodules; 15 percent, by volume, cobbles and 25 percent, by volume, gravel; few fine flakes of mica; strongly acid; gradual wavy boundary.

2BC—59 to 75 inches; yellowish brown (10YR 5/6) very cobbly clay loam; common medium distinct red (2.5YR 4/8) and few fine and medium distinct light yellowish brown (10YR 6/4) mottles; weak medium subangular blocky structure; friable; common manganese nodules; 20 percent, by volume, gravel and 15 percent, by volume, cobbles; few fine flakes of mica; strongly acid.

The thickness of the solum is more than 60 inches. The depth to bedrock is more than 72 inches. Generally, reaction ranges from very strongly acid to moderately acid in unlimed areas. In areas of the A horizon and the upper part of the Bt horizon that have been intensively cultivated and frequently limed, however, reaction is typically moderately acid to neutral. The number of mica flakes is few or common. The content of waterworn rock fragments ranges from 0 to 35 percent, by volume, in the upper 40 inches and from 0 to 60 percent, by volume, below a depth of 40 inches. The rock fragments are mainly gravel or cobbles in size.

The A or Ap horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 to 4.

Some pedons have a thin BA horizon. This horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 4 to 8. It is sandy clay loam or clay loam in the fine-earth fraction.

The Bt horizon and the 2Bt horizon, if it occurs, have hue of 5YR to 10YR, value of 4 to 6, and chroma of 4 to 8. They are clay loam or clay in the fine-earth fraction. The Bt horizon contains as much as 35 percent rock fragments. The 2Bt horizon contains 35 to 60 percent, by volume, rock fragments.

The BC and 2BC horizons, if they occur, are similar in color to the Bt and 2Bt horizons. They are loam, sandy clay loam, or clay loam in the fine-earth fraction. The BC horizon contains as much as 35 percent, by volume, rounded rock fragments. The 2BC horizon contains 35 to 60 percent, by volume, rounded rock fragments.

Some pedons have a C or 2C horizon. These horizons are loamy or sandy alluvial or colluvial material that varies in color. The content of rounded rock fragments is as much as 35 percent, by volume, in the C horizon and as much as 60 percent, by volume, in the 2C horizon.

Edneyville Series

These soils are very deep, well drained, and moderately rapidly permeable. They formed in saprolite weathered from high-grade metamorphic rocks. They generally are on ridgetops and south- to west-facing side slopes. Elevation generally ranges from 3,500 to 4,800 feet. Slope ranges from 8 to 95 percent. The soils are classified as coarse-loamy, mixed, mesic Typic Dystrochrepts.

Edneyville soils are geographically associated with Chestnut and Plott soils. Chestnut soils are moderately deep to weathered bedrock and are on the upper part of side slopes or spur ridges. Plott soils have an umbric epipedon and are generally on north- to east-facing side slopes.

Typical pedon of Edneyville gravelly fine sandy loam, in an area of Edneyville-Chestnut complex, 30 to 50 percent slopes, stony; about 8.1 miles east of Tuckasegee, 4.6 miles east of the intersection of North Carolina Highway 281 and Secondary Road 1760, about 500 feet south of the dam on Meade Lake, in a wooded area (State plane coordinates 575,950 feet N., 814,800 feet E.):

Oi—2 inches to 0; partly decomposed leaves, twigs, roots, and other deciduous plant material.

A—0 to 5 inches; dark brown (7.5YR 3/4) gravelly fine sandy loam; weak medium granular structure; very

friable; many fine to coarse roots; 15 percent, by volume, gravel and 5 percent, by volume, cobbles; common fine flakes of mica; very strongly acid; clear smooth boundary.

Bw1—5 to 17 inches; strong brown (7.5YR 4/6) fine sandy loam; weak medium subangular blocky structure; very friable; few medium and coarse roots; 5 percent, by volume, gravel; common fine flakes of mica; very strongly acid; gradual wavy boundary.

Bw2—17 to 28 inches; strong brown (7.5YR 5/6) fine sandy loam; weak medium subangular blocky structure; very friable; few medium and coarse roots; 5 percent, by volume, gravel; common fine flakes of mica; strongly acid; gradual wavy boundary.

BC—28 to 37 inches; yellowish brown (10YR 5/6) sandy loam; few fine distinct strong brown (7.5YR 5/6) and common fine distinct yellow (10YR 7/6) mottles; weak fine subangular blocky structure; very friable; few medium and coarse roots; 5 percent, by volume, gravel; few fine flakes of mica; few medium rounded soft masses of iron-manganese; strongly acid; gradual wavy boundary.

C—37 to 60 inches; multicolored sandy loam that weathered from saprolite; massive; very friable; few medium roots; 10 percent, by volume, gravel; common fine flakes of mica; few medium rounded soft masses of iron-manganese; very strongly acid.

The thickness of the solum ranges from 20 to 50 inches. The depth to weathered bedrock is more than 60 inches. Reaction is very strongly acid to moderately acid in unlimed areas. The number of mica flakes is few or common. The content of rock fragments ranges from 0 to 35 percent, by volume, in the 10- to 40-inch control section.

The A or Ap horizon has hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 2 to 4. Where value is 3 and chroma is 2 or 3, the horizon is less than 7 inches thick.

The Bw horizon has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 4 to 8. It is fine sandy loam, loam, or sandy loam in the fine-earth fraction.

The BC horizon, if it occurs, is similar in color and texture to the Bw horizon.

The C horizon is multicolored saprolite weathered from high-grade metamorphic rocks. It is fine sandy loam, sandy loam, loam, loamy fine sand, or loamy sand in the fine-earth fraction.

Ellijay Series

These soils are very deep, well drained, and moderately permeable. They formed in saprolite weathered from ultramafic rocks. They are on ridgetops and side slopes. Elevation generally ranges from 2,000 to 3,000 feet. Slope ranges from 2 to 30 percent. The soils are classified as fine, mixed, mesic Rhodic Kanhapludalfs.

Ellijay soils are geographically associated with Cowee, Evard, and Braddock soils. The associated soils have less than 35 percent base saturation. Cowee and Evard soils formed in saprolite weathered from high-grade metamorphic rocks. They are fine-loamy and are on the steeper adjacent mountains. Also, Cowee soils are moderately deep to weathered bedrock. Braddock soils formed in old alluvium or colluvium and are on high stream terraces or colluvial fans.

Typical pedon of Ellijay silty clay loam, 8 to 15 percent slopes, eroded; 3.5 miles south of Sylva on North Carolina Highway 107, about 1.9 miles southwest on North Carolina Highway 116, about 0.2 mile southeast of Webster on Secondary Road 1346, about 50 feet west of the road, in a wooded area (State plane coordinates 605,000 feet N., 740,000 feet E.):

A—0 to 4 inches; dusky red (10R 3/4) silty clay loam; moderate fine granular structure; very friable; many fine and coarse roots; 5 percent, by volume, gravel, cobbles, and stones; strongly acid; gradual wavy boundary.

Bt1—4 to 15 inches; dark red (10R 3/6) clay; moderate medium subangular blocky structure; friable, sticky and slightly plastic; many fine and coarse roots; 5 percent, by volume, gravel, cobbles, and stones in a line at the base of this horizon; strongly acid; gradual wavy boundary.

Bt2—15 to 34 inches; dark red (10R 3/6) clay; moderate medium subangular blocky structure; friable, sticky and slightly plastic; common fine and coarse roots; 5 percent, by volume, gravel, cobbles, and stones; moderately acid; gradual wavy boundary.

BC—34 to 52 inches; dark red (2.5YR 3/6) loam; weak medium subangular blocky structure; very friable; few fine and medium roots; 5 percent, by volume, gravel, cobbles, and stones; moderately acid; clear wavy boundary.

C1—52 to 59 inches; mottled yellowish red (5YR 5/6), reddish yellow (7.5YR 6/8), and brownish yellow (10YR 6/6) clay loam that weathered from saprolite; massive; very friable; few fine roots; 5 percent, by volume, gravel, cobbles, and stones; few black concretions; slightly acid; gradual wavy boundary.

C2—59 to 70 inches; mottled strong brown (7.5YR 5/8), yellowish red (5YR 5/8), and very pale brown (10YR 7/4) loam that weathered from saprolite; massive; very friable; 5 percent, by volume, gravel, cobbles, and stones; few black concretions; slightly acid.

The thickness of the solum ranges from 30 to 60

inches. The depth to bedrock is more than 60 inches. Reaction in the A horizon ranges from very strongly acid to moderately acid in unlimed areas. It ranges from strongly acid to neutral in the Bt, BC, and C horizons. A substantial calcium-magnesium imbalance is in the Bt, BC, and C horizons. The number of mica flakes ranges from none to common. The content of rock fragments is as much as 35 percent, by volume, in the A horizon and as much as 15 percent, by volume, in the other horizons.

The A or Ap horizon has hue of 10R to 7.5YR, value of 3, and chroma of 2 to 6.

Thin AB or BA horizons, if they occur, have hue of 10R to 5YR, value of 3, and chroma of 4 to 6. They are silty clay loam or clay loam in the fine-earth fraction.

The Bt horizon has hue of 10R or 2.5YR, value of 3, and chroma of 4 to 6. The dry color value is 4. The horizon is clay, silty clay loam, or clay loam in the fine-earth fraction.

The BC or CB horizon, if it occurs, has hue of 10R to 5YR, value of 3 to 6, and chroma of 4 to 8. It is loam, clay loam, or silty clay loam in the fine-earth fraction.

The C horizon is multicolored saprolite. It is loam, clay loam, fine sandy loam, or sandy loam in the fine-earth fraction.

Evard Series

These soils are very deep, well drained, and moderately permeable (fig. 20). They formed in saprolite weathered from high-grade metamorphic rocks. They are generally on ridgetops and south- to west-facing side slopes. Elevation generally ranges from 2,000 to 3,500 feet. Slope ranges from 8 to 95 percent. The soils are classified as fine-loamy, oxidic, mesic Typic Hapludults.

Evard soils are geographically associated with Cowee and Trimont soils. Cowee soils are moderately deep to weathered bedrock and are on the upper part of side slopes or on spur ridges. Trimont soils have a humic epipedon and generally are on north- to east-facing side slopes.

Typical pedon of Evard gravelly loam, in an area of Evard-Cowee complex, 50 to 95 percent slopes; 0.8 mile west of the entrance to Western Carolina University in Cullowhee, 2,000 feet south of the Jackson County Airport terminal on Airport Road, 100 feet south of the intersection of Airport Road and a power transmission line (State plane coordinates 593,000 feet N., 746,000 feet E.):

Oi—2 inches to 0; partly decomposed leaves, twigs, roots, and other deciduous plant material.

A1—0 to 3 inches; dark brown (7.5YR 4/4) gravelly loam; weak fine granular structure; very friable; common fine to coarse roots; 20 percent, by volume, gravel; common fine flakes of mica; strongly acid; clear wavy boundary.

A2—3 to 6 inches; strong brown (7.5YR 4/6) gravelly loam; moderate medium granular structure; very friable; common fine and medium roots; 20 percent, by volume, gravel; common fine flakes of mica; strongly acid; clear wavy boundary.

Bt1—6 to 14 inches; red (2.5YR 4/8) clay loam; moderate medium subangular blocky structure; friable, sticky and slightly plastic; common medium and coarse roots; few discontinuous clay films on faces of peds; 10 percent, by volume, gravel; common fine flakes of mica; very strongly acid; gradual wavy boundary.

Bt2—14 to 27 inches; red (2.5YR 4/6) clay loam; moderate fine and medium subangular blocky structure; friable, sticky and slightly plastic; common medium and coarse roots; few discontinuous clay films on faces of peds; 10 percent, by volume, gravel; common fine flakes of mica; very strongly acid; gradual wavy boundary.

BC—27 to 35 inches; mottled red (2.5YR 4/6), yellowish red (5YR 4/6), and strong brown (7.5YR 4/6) loam; weak medium subangular blocky structure; friable; few medium and coarse roots; 10 percent, by volume, gravel; common fine flakes of mica; very strongly acid; gradual wavy boundary.

C—35 to 60 inches; multicolored sandy loam that weathered from saprolite; massive; friable; few coarse roots; 10 percent, by volume, gravel; common fine flakes of mica; common manganese coatings on saprolite cleavage planes; very strongly acid.

The thickness of the solum ranges from 20 to 40 inches or more. The depth to weathered, high-grade metamorphic crystalline bedrock is more than 60 inches. Reaction is very strongly acid to moderately acid in unlimed areas. The number of mica flakes is few or common. The content of rock fragments ranges from 0 to 35 percent, by volume.

The A or Ap horizon has hue of 5YR to 10YR, value of 3 to 5, and chroma of 3 to 6. Where value is 3 and chroma is 3 or 4, the horizon is less than 6 inches thick.

The Bt horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 4 to 8. It is loam, sandy clay loam, or clay loam in the fine-earth fraction.

The BC horizon, if it occurs, has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 6 to 8. It is sandy loam, fine sandy loam, loam, sandy clay loam, or clay loam in the fine-earth fraction.

The C horizon is multicolored saprolite weathered from high-grade metamorphic rocks. It is sandy loam,

fine sandy loam, loam, loamy fine sand, or loamy sand in the fine-earth fraction.

Fannin Series

These soils are very deep, well drained, and moderately permeable. They formed in saprolite weathered from mica-rich, high-grade metamorphic rocks. They are generally on ridgetops and south- to west-facing side slopes. Elevation is generally 2,000 to 3,500 feet. Slope ranges from 8 to 95 percent. The soils are classified as fine-loamy, micaceous, mesic Typic Hapludults.

Fannin soils are geographically associated with Cashiers and Chandler soils. The associated soils are browner in color than the Fannin soils and are coarse-loamy. Also, Cashiers soils have an Umbric Dystrochrept feature and generally are on north- to east-facing side slopes.

Typical pedon of Fannin fine sandy loam, 30 to 50 percent slopes; 8.2 miles south of the intersection of U.S. Highway 64 and North Carolina Highway 107 in Cashiers, 0.1 mile southeast of the intersection of Secondary Roads 1100 and 1101, about 100 feet north of Secondary Road 1100, in a wooded area (State plane coordinates 486,000 feet N., 773,000 feet E.):

Oi—2 inches to 0; partly decomposed leaves and needles of deciduous and coniferous plants.

A—0 to 3 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine and medium granular structure; very friable; many fine and medium roots; common fine flakes of mica; very strongly acid; clear smooth boundary.

BA—3 to 6 inches; strong brown (7.5YR 4/6) loam; weak medium subangular blocky structure; very friable; common fine and medium roots; common fine and medium flakes of mica; strongly acid; clear wavy boundary.

Bt—6 to 24 inches; yellowish red (5YR 4/6) sandy clay loam; moderate medium subangular blocky structure; friable; common medium roots; few discontinuous clay films on faces of peds; many fine and medium flakes of mica; strongly acid; gradual wavy boundary.

BC—24 to 42 inches; yellowish red (5YR 5/8) sandy loam; weak fine subangular blocky structure; very friable; few medium roots; many fine flakes of mica; strongly acid; gradual wavy boundary.

C—42 to 60 inches; yellowish red (5YR 5/8) sandy loam that weathered from saprolite; massive; very friable; many fine flakes of mica; strongly acid.

The thickness of the solum ranges from 20 to more than 45 inches. The depth to bedrock is more than 72 inches. Reaction is very strongly acid to moderately acid in unlimed areas. The number of mica flakes is common or many in the surface layer and the upper part of the Bt horizon and is many in the lower part of the Bt horizon and in the BC and C horizons. The content of mica is 40 percent or more in the control section. The content of rock fragments ranges from 0 to 35 percent, by volume, in the control section.

The A or Ap horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 4. Where value is 3 and chroma is 2 to 4, the horizon is less than 6 inches thick.

Some pedons have a BA horizon. This horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. It is fine sandy loam or loam in the fine-earth fraction.

The Bt horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 4 to 8. It is loam, sandy clay loam, or clay loam in the fine-earth fraction.

The BC horizon, if it occurs, is similar in color to the Bt horizon. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The C horizon is yellowish red (5YR 5/8) or multicolored saprolite weathered from mica-rich, high-grade metamorphic rocks. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

Hemphill Series

These soils are very deep, very poorly drained, and slowly permeable. They formed in alluvium. They are on low stream terraces. Elevation generally ranges from 1,850 to 2,500 feet. Slope ranges from 0 to 3 percent. The soils are classified as fine, mixed, mesic Typic Umbraqualfs.

Hemphill soils are geographically associated with Dillard and Statler soils. The associated soils are fine-loamy and are in slightly elevated areas. Dillard soils are moderately well drained, and Statler soils are well drained.

Typical pedon of Hemphill clay loam, 0 to 3 percent slopes, rarely flooded; about 0.5 mile southeast of Whittier on Secondary Road 1397, about 0.2 mile north of an entrance to a farm (State plane coordinates 638,000 feet N., 703,000 feet E.):

Ap—0 to 13 inches; very dark gray (10YR 3/1) clay loam; weak fine and medium granular structure; friable; many fine and medium roots; common fine and medium flakes of mica; slightly acid; clear smooth boundary.

Btg1—13 to 20 inches; dark grayish brown (10YR 4/2) clay; few fine distinct yellowish brown (10YR 5/6) mottles; moderate fine and medium subangular blocky structure; firm, slightly sticky and slightly

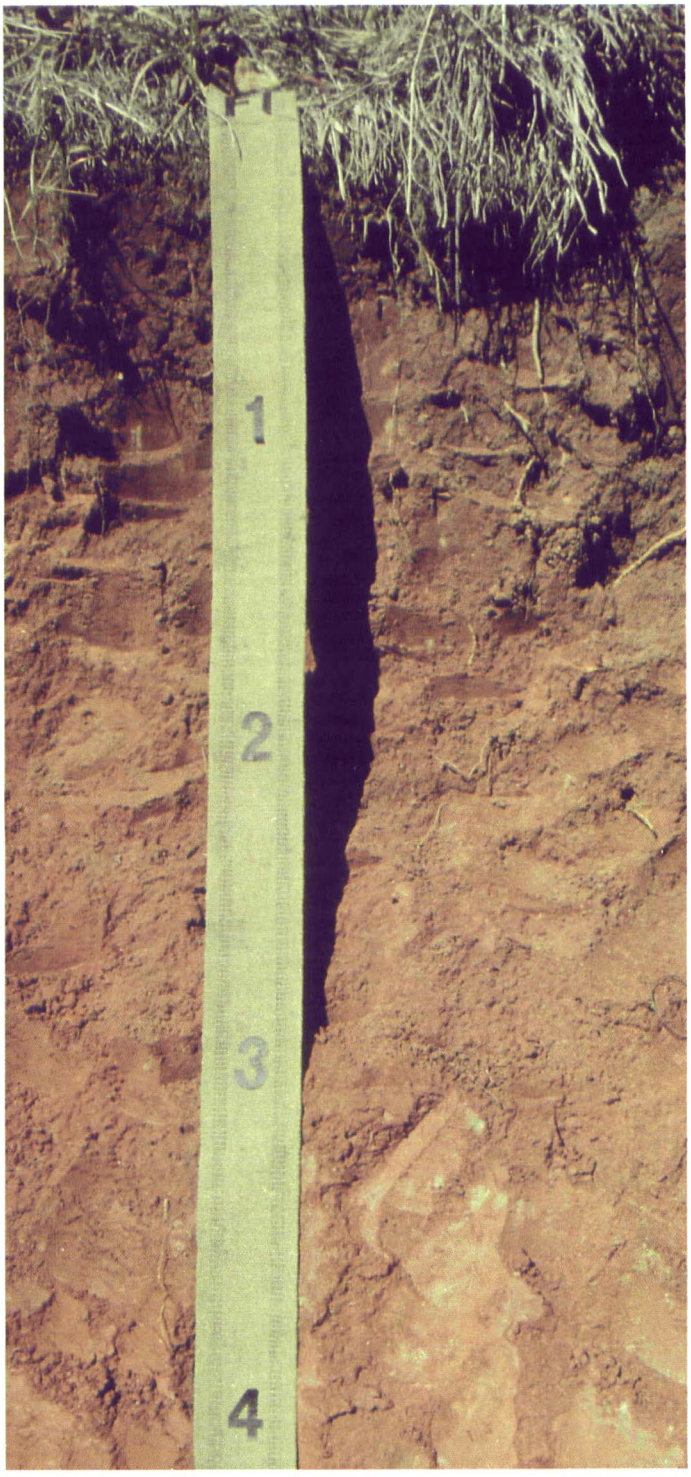

Figure 20.—Typical pedon of Evard gravelly loam. These loamy soils typically have a thin surface layer and are very deep to bedrock. Depth is marked in feet.

Figure 21.—Typical pedon of Junaluska channery fine sandy loam. These soils are moderately deep to soft metasedimentary rocks. Depth is marked in feet.

Figure 22.—Typical pedon of Saunook gravelly loam. These soils have a dark surface layer that typically extends to a depth of about 9 inches. Depth is marked in feet.

Figure 23.—Typical pedon of Trimont gravelly loam. These soils are very deep and well drained and commonly are on the cool lower mountainsides. Depth is marked in feet.

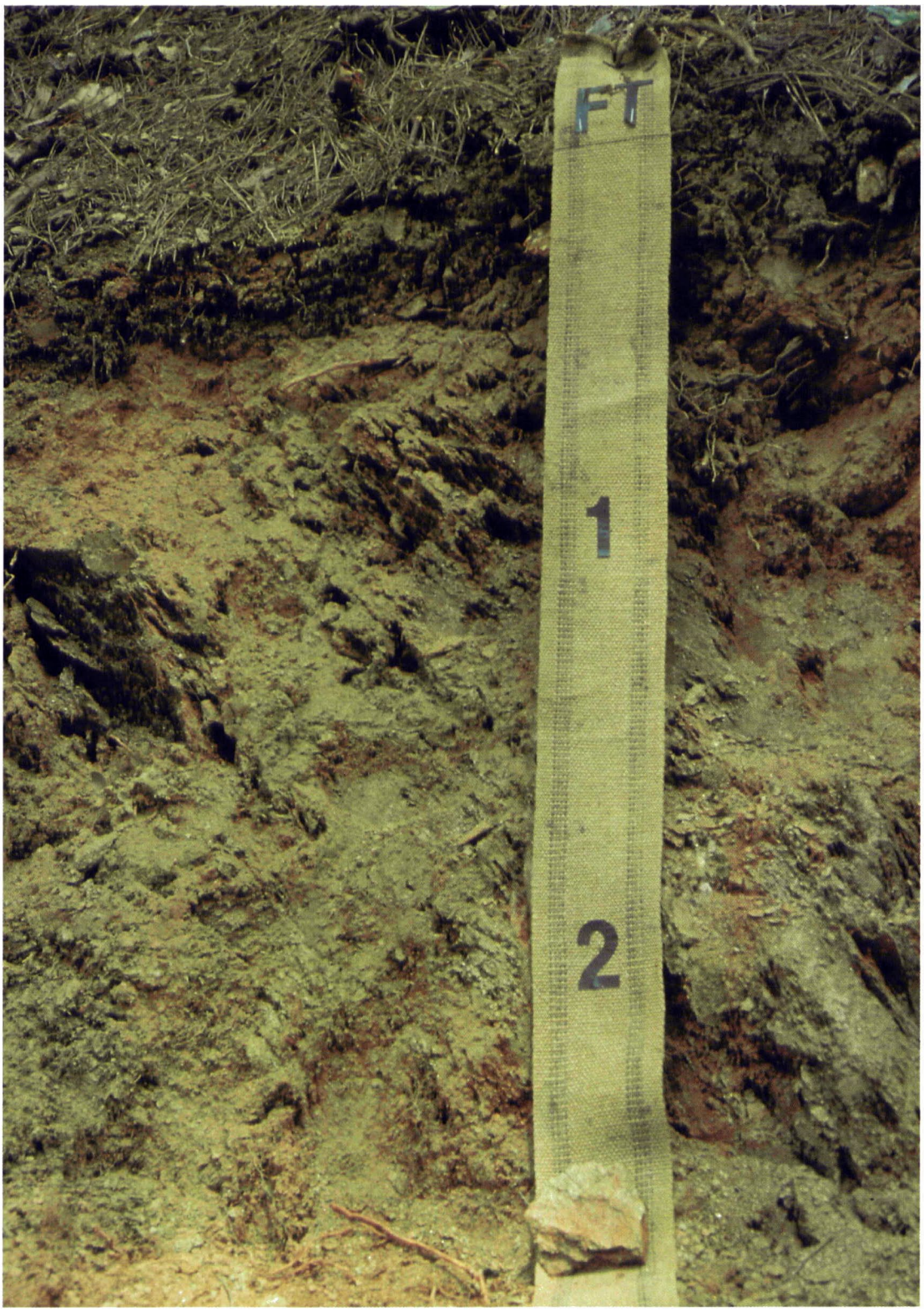

Figure 24.—Typical pedon of Tsali channery fine sandy loam. These soils have soft bedrock at a depth of 12 to 20 inches. Depth is marked in feet.

Figure 25.—Typical pedon of Tuckasegee gravelly loam. These soils have a thick, dark surface layer and commonly are on benches in coves. Depth is marked in feet.

plastic; common fine and medium roots between peds; common fine and medium pores; few distinct clay films on faces of peds; common fine and medium flakes of mica; strongly acid; clear wavy boundary.

Btg2—20 to 26 inches; grayish brown (10YR 5/2) clay; common fine distinct yellowish brown (10YR 5/6) mottles; moderate fine and medium subangular blocky structure; firm, slightly sticky and slightly plastic; few fine and medium roots between peds; few fine and medium pores; few distinct clay films on faces of peds; common fine and medium flakes of mica; strongly acid; gradual wavy boundary.

Btg3—26 to 38 inches; grayish brown (10YR 5/2) clay loam; common medium prominent strong brown (7.5YR 5/8) mottles; moderate coarse subangular blocky structure; firm, slightly sticky and slightly plastic; few fine and medium roots between peds; few fine and medium pores; few distinct clay films on faces of peds; common fine and medium flakes of mica; strongly acid; gradual wavy boundary.

BCg1—38 to 44 inches; light brownish gray (10YR 6/2) loam; many medium prominent strong brown (7.5YR 5/6) mottles; moderate coarse subangular blocky structure; friable, slightly sticky and slightly plastic; few fine and medium roots and pores; common fine and medium flakes of mica; moderately acid; gradual wavy boundary.

BCg2—44 to 64 inches; light brownish gray (10YR 6/2) fine sandy loam; many medium distinct dark yellowish brown (10YR 4/4) mottles; weak fine and medium platy structure; friable, nonsticky and nonplastic; few coarse roots; many fine and medium flakes of mica; moderately acid; abrupt smooth boundary.

Cg—64 to 80 inches; dark gray (N 4/0) fine sandy loam; massive; very friable, nonsticky and nonplastic; few coarse roots; many fine and medium flakes of mica; strongly acid.

The thickness of the solum ranges from 40 to 60 inches or more. The depth to bedrock is more than 60 inches. Reaction is very strongly acid to neutral. The number of mica flakes is few or common in the A and Btg horizons and ranges from few to many in the BCg, Cg, and C horizons, if they occur. The content of rock fragments ranges from 0 to 15 percent, by volume, in the A, Btg, BCg, and Cg horizons. In some pedons, the Cg horizon is as much as 60 percent, by volume, rock fragments.

The Ap or A horizon has hue of 7.5YR to 2.5Y, value of 2 or 3, and chroma of 0 to 3, or it is neutral in hue and has value of 2 or 3.

The Btg horizon commonly has hue of 7.5YR to 5Y, value of 2 to 6, and chroma of 0 to 2, or it is neutral in hue and has value of 2 to 6. In some pedons, this horizon has hue of 5GY, 5G, 5BG, or 5B, value of 4 to 7, and chroma of 1. It is silty clay, clay loam, silty clay loam, or clay in the fine-earth fraction.

The BCg or CBg horizon, if it occurs, typically has hue of 7.5YR to 5Y, value of 4 to 6, and chroma of 0 to 2, or it is neutral in hue and has value of 4 to 6. In some pedons, it has hue of 5GY, 5G, 5BG, or 5B, value of 4 to 7, and chroma of 1. It is sandy loam, fine sandy loam, loam, sandy clay loam, silt loam, silty clay loam, silty clay, clay loam, or clay in the fine-earth fraction.

The Cg horizon, if it occurs, is similar in color to the BCg horizon and ranges from sand to clay loam in the fine-earth fraction.

Junaluska Series

These soils are moderately deep, well drained, and moderately permeable. They formed in saprolite weathered from metasedimentary rocks, such as phyllite or metasandstone (fig. 21). They are on ridgetops and side slopes. Elevation generally ranges from 1,900 to 3,500 feet. Slope ranges from 15 to 95 percent. The soils are classified as fine-loamy, mixed, mesic Typic Hapludults.

Junaluska soils are geographically associated with Brasstown and Tsali soils. Brasstown soils are deep to weathered bedrock and are on the lower side slopes. Tsali soils are shallow to weathered bedrock and are on narrow ridges and dissected side slopes.

Typical pedon of Junaluska channery fine sandy loam, in an area of Junaluska-Brasstown complex, 30 to 50 percent slopes; about 0.4 mile northeast of Wilmot on Cane Branch, 0.25 mile northwest of Cane Branch, in a wooded area (State plane coordinates 631,000 feet N., 717,000 feet E.):

Oi—1 inch to 0; partly decomposed leaves, twigs, roots, and other deciduous plant material.

A—0 to 3 inches; dark brown (10YR 4/3) channery fine sandy loam; weak medium granular structure; very friable; many fine to coarse roots; 20 percent, by volume, channers; few fine flakes of mica; very strongly acid; clear wavy boundary.

BA—3 to 13 inches; strong brown (7.5YR 5/6) channery loam; weak medium subangular blocky structure; friable; common fine to coarse roots; 20 percent, by volume, channers; few fine flakes of mica; very strongly acid; gradual wavy boundary.

Bt—13 to 28 inches; yellowish red (5YR 5/8) channery clay loam; weak fine and medium subangular blocky structure; friable; common fine and medium roots; few distinct clay films on faces of peds; 25 percent, by volume, channers; few fine flakes of mica; very

strongly acid; clear irregular boundary.
Cr—28 to 60 inches; multicolored, weathered, fractured phyllite; few thin seams of yellowish red (5YR 5/8) clay loam in rock fractures.

The thickness of the solum ranges from 16 to 39 inches. The depth to weathered bedrock is 20 to 40 inches. The depth to hard bedrock is more than 40 inches. Reaction is very strongly acid or strongly acid in unlimed areas. The number of mica flakes is few or common. The content of rock fragments ranges from 5 to 35 percent, by volume.

The A horizon has hue of 5YR to 10YR, value of 3 to 5, and chroma of 3 to 8. Where value is 3 and chroma is 3 or 4, the horizon is less than 6 inches thick.

The BA horizon, if it occurs, has hue of 5YR or 7.5YR, value of 4 to 6, and chroma of 4 to 8. It is loam or fine sandy loam in the fine-earth fraction.

The Bt horizon has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8. It is sandy clay loam, clay loam, or loam in the fine-earth fraction.

The BC horizon, if it occurs, has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8. It is loam or fine sandy loam in the fine-earth fraction.

The C horizon, if it occurs, is multicolored saprolite weathered from metasedimentary rock. It is fine sandy loam or loam in the fine-earth fraction.

The Cr horizon is multicolored, weathered, partly consolidated metasedimentary rock, such as phyllite or metasandstone.

Nikwasi Series

These soils are moderately deep to strata of sand, gravel, and cobbles and very deep to bedrock. They are poorly drained or very poorly drained and are moderately rapidly permeable in the A horizon and rapidly permeable in the C horizon. They formed in recent alluvium derived from high-grade metamorphic or metasedimentary rocks. They are on narrow flood plains along small streams near the area of contact between the flood plains and the uplands. Elevation generally ranges from 1,850 to 3,000 feet. Slope ranges from 0 to 2 percent. The soils are classified as coarse-loamy over sandy or sandy-skeletal, mixed, nonacid, mesic Cumulic Humaquepts.

Nikwasi soils are geographically associated with Cullowhee, Dellwood, and Reddies soils. Cullowhee soils are somewhat poorly drained and are in slight depressions. Dellwood soils are moderately well drained and are shallow to strata of sand, gravel, or cobbles. They contain more than 35 percent rock fragments, by volume, in the 10- to 40-inch control section. Reddies soils are moderately well drained and are in slightly elevated areas.

Typical pedon of Nikwasi fine sandy loam, 0 to 2 percent slopes, frequently flooded; about 6 miles northeast of Sylva on U.S. Highways 19 and 23, about 2,000 feet northeast of Mt. Pleasant Church, 75 feet east of Scott Creek, in a hay field (State plane coordinates 632,000 feet N., 776,000 feet E.):

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) fine sandy loam; moderate fine granular structure; very friable; common fine roots; few rounded gravel; common fine and medium flakes of mica; slightly acid; clear wavy boundary.
A—8 to 26 inches; very dark gray (10YR 3/1) fine sandy loam; weak medium granular structure; very friable; common fine roots; few rounded gravel; common fine and medium flakes of mica; slightly acid; clear smooth boundary.
Cg—26 to 60 inches; dark grayish brown (10YR 4/2) and multicolored extremely gravelly coarse sand; single grained; loose; dominantly waterworn gravel and many cobbles; common fine and medium flakes of mica; moderately acid.

The solum is 24 to 40 inches deep over strata of sand, gravel, or cobbles. The strata have more than 35 percent, by volume, gravel and cobbles. Rock fragments, dominantly of gravel size, are in the A and Bw horizons in some pedons, but they make up less than 35 percent of the volume. The depth to bedrock is more than 60 inches. Reaction is very strongly acid to slightly acid. The number of mica flakes is few or common.

The Ap or A horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 to 3.

The Cg horizon has hue of 2.5Y or 10YR, value of 4 to 7, and chroma of 1 or 2, or it is neutral and has value of 4 to 7. It is coarse sand, sand, or loamy sand in the fine-earth fraction.

Oconaluftee Series

These soils are very deep, well drained, and moderately rapidly permeable. They formed in saprolite weathered from metasedimentary rocks. They are on ridgetops and side slopes. Elevation is generally above 4,800 feet. Slope ranges from 15 to 95 percent. The soils are classified as coarse-loamy, mixed, frigid Typic Haplumbrepts.

Oconaluftee soils are geographically associated with Cheoah, Soco, and Stecoah soils. The associated soils generally are below 4,800 feet in elevation. Cheoah and Stecoah soils are deep to weathered bedrock, and Soco soils are moderately deep to weathered bedrock. Cheoah soils are on north- to east-facing side slopes.

Soco and Stecoah soils are on south- to west-facing slopes and have an ochric epipedon.

Typical pedon of Oconaluftee channery loam, windswept, 50 to 95 percent slopes; about 7.8 miles northeast of Cherokee on U.S. Highway 19 to Soco Gap, 2.0 miles northeast on the Blue Ridge Parkway, 400 feet west of the parkway at the north end of Bunches Bald Tunnel (State plane coordinates 668,000 feet N., 752,000 feet E.):

Oe—2 inches to 0; partly decomposed organic litter and root mat.

A1—0 to 8 inches; black (10YR 2/1) channery loam; weak fine granular structure; very friable; many fine and medium roots; 25 percent, by volume, phyllite and metasandstone channers and flagstones; common fine flakes of mica; extremely acid; clear wavy boundary.

A2—8 to 19 inches; dark brown (10YR 3/3) channery loam; weak medium granular structure; very friable; common fine and medium roots; 20 percent, by volume, phyllite and metasandstone channers; common fine flakes of mica; strongly acid; clear wavy boundary.

Bw—19 to 35 inches; dark yellowish brown (10YR 4/4) channery fine sandy loam; weak medium subangular blocky structure; very friable; few fine and medium roots; 20 percent, by volume, phyllite and metasandstone channers; common fine flakes of mica; very strongly acid; gradual wavy boundary.

C—35 to 67 inches; olive brown (2.5Y 4/4), white (10YR 8/2), gray (10YR 6/1), and black (10YR 2/1) channery fine sandy loam that weathered from saprolite weathered from interbedded phyllite and metasandstone; rock-controlled structure; few fine and medium roots; 25 percent, by volume, phyllite and metasandstone channers; common fine flakes of mica; strongly acid.

The thickness of the solum ranges from 30 to 60 inches. Reaction ranges from extremely acid to strongly acid in the A horizon and from very strongly acid to moderately acid in the other horizons. The number of mica flakes is few or common. The content of rock fragments is as much as 35 percent, by volume.

The A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 to 3.

Some pedons have an AB horizon. This horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4. It is loam, fine sandy loam, or silt loam in the fine-earth fraction.

The Bw horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 8. It is loam, fine sandy loam, or silt loam in the fine-earth fraction.

Some pedons have a BC horizon. This horizon is similar in color and texture to the Bw horizon.

The C horizon is saprolite weathered from metasedimentary rocks, such as phyllite and metasandstone. It varies in color and is fine sandy loam, loam, or silt loam in the fine-earth fraction.

Plott Series

These soils are very deep, well drained, and moderately rapidly permeable. They formed in saprolite weathered from high-grade metamorphic rocks. They generally are on shaded ridgetops and north- to east-facing side slopes. Elevation generally ranges from 3,500 to 4,800 feet. Slope ranges from 15 to 95 percent. The soils are classified as coarse-loamy, mixed, mesic Typic Haplumbrepts.

Plott soils are geographically associated with Chestnut and Edneyville soils. The associated soils have an ochric epipedon and are generally on south- to west-facing side slopes. Also, Chestnut soils are moderately deep to weathered bedrock.

Typical pedon of Plott fine sandy loam, 30 to 50 percent slopes, stony; about 2.0 miles west of the dam on Lake Thorpe on Secondary Road 1157, about 0.5 mile south of Double Spring Church, 600 feet west of Secondary Road 1157, in a wooded area (State plane coordinates 555,000 feet N., 748,000 feet E.):

Oi—2 inches to 0; partly decomposed leaves, twigs, roots, and other deciduous and coniferous plant material.

A1—0 to 8 inches; very dark grayish brown (10YR 3/2) fine sandy loam; moderate fine and medium granular structure; very friable; many fine to coarse roots; 5 percent, by volume, gravel and 5 percent, by volume, cobbles; few fine flakes of mica; strongly acid; clear wavy boundary.

A2—8 to 12 inches; dark brown (10YR 3/3) gravelly fine sandy loam; moderate fine and medium granular structure; very friable; many fine to coarse roots; 15 percent, by volume, gravel and 5 percent, by volume, cobbles; few fine flakes of mica; strongly acid; clear wavy boundary.

Bw1—12 to 18 inches; dark yellowish brown (10YR 4/4) gravelly loam; moderate medium subangular blocky structure; very friable; common medium and coarse roots; 15 percent, by volume, gravel and 5 percent, by volume, cobbles; common fine flakes of mica; strongly acid; gradual wavy boundary.

Bw2—18 to 26 inches; dark yellowish brown (10YR 4/6) cobbly fine sandy loam; moderate medium subangular blocky structure; very friable; few medium and coarse roots; 15 percent, by volume, cobbles and 5 percent, by volume, gravel; common

fine flakes of mica; strongly acid; gradual wavy boundary.

BC—26 to 36 inches; yellowish brown (10YR 5/6) cobbly fine sandy loam; weak medium subangular blocky structure; very friable; few medium and coarse roots; 15 percent, by volume, cobbles and 5 percent, by volume, gravel; common fine flakes of mica; strongly acid; gradual wavy boundary.

C1—36 to 45 inches; light yellowish brown (10YR 6/4) cobbly sandy loam; massive; very friable; few medium and coarse roots; 15 percent, by volume, cobbles and 5 percent, by volume, gravel; common fine flakes of mica; strongly acid; gradual wavy boundary.

C2—45 to 60 inches; multicolored cobbly sandy loam that weathered from saprolite; massive; very friable; few medium roots; 20 percent, by volume, cobbles and 5 percent, by volume, gravel; common fine flakes of mica; strongly acid.

The thickness of the solum is 30 to more than 60 inches. The depth to bedrock is more than 60 inches. Reaction ranges from extremely acid to moderately acid in unlimed areas. The number of mica flakes is few or common. The content of rock fragments is as much as 35 percent, by volume, in the 10- to 40-inch control section. Below a depth of 40 inches, the content of rock fragments may be as much as 60 percent, by volume, in the lower part of the Bw horizon and in the BC and C horizons.

The A or Ap horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 to 3.

Some pedons have a thin AB or BA horizon. This horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4. It is loam, fine sandy loam, or sandy loam in the fine-earth fraction.

The Bw horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 4 to 8. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The BC or CB horizon, if it occurs, has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 8. It is loam, fine sandy loam, or sandy loam in the fine-earth fraction.

The C horizon, if it occurs, is light yellowish brown (10YR 6/4) or multicolored saprolite weathered from high-grade metamorphic rocks. It is fine sandy loam, sandy loam, loamy fine sand, or loamy sand in the fine-earth fraction.

Reddies Series

These soils are moderately deep to strata of sand, gravel, and cobbles and very deep to bedrock. They are moderately well drained and are moderately rapidly permeable in the surface layer and the subsoil and rapidly permeable or very rapidly permeable in the underlying material. They formed in recent alluvium derived from high-grade metamorphic or metasedimentary rocks. They are on narrow flood plains along small streams. Elevation generally ranges from 1,850 to 3,000 feet. Slope ranges from 0 to 2 percent. The soils are classified as coarse-loamy over sandy or sandy-skeletal, mixed, mesic Fluventic Haplumbrepts.

Reddies soils are geographically associated with Cullowhee, Dellwood, and Nikwasi soils. Cullowhee and Nikwasi soils are in depressions. Cullowhee soils are somewhat poorly drained, and Nikwasi soils are poorly drained and very poorly drained. Dellwood soils are moderately well drained and are shallow to strata of sand, gravel, or cobbles. They have more than 35 percent, by volume, rock fragments in the 10- to 40-inch control section.

Typical pedon of Reddies fine sandy loam, 0 to 2 percent slopes, occasionally flooded; 3.2 miles east of Cullowhee, 1.25 miles northeast of the intersection of North Carolina Highway 107 and Secondary Road 1737, about 200 feet south of the intersection of Secondary Roads 1737 and 1740, in a broccoli field (State plane coordinates 600,000 feet N., 740,000 feet E.):

Ap—0 to 14 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak fine granular structure; very friable; many fine roots; 5 percent, by volume, gravel; common fine flakes of mica; neutral; clear smooth boundary.

Bw—14 to 26 inches; dark yellowish brown (10YR 4/6) fine sandy loam; weak medium subangular blocky structure; very friable; common fine roots; common fine and medium flakes of mica; slightly acid; clear irregular boundary.

C1—26 to 41 inches; dark yellowish brown (10YR 4/6) very gravelly sand; single grained; loose; 40 percent, by volume, gravel and 5 percent, by volume, cobbles; common fine and medium flakes of mica; slightly acid; abrupt wavy boundary.

C2—41 to 60 inches; multicolored very gravelly sand; single grained; loose; 40 percent, by volume, gravel and 10 percent, by volume, cobbles; common fine and medium flakes of mica; moderately acid.

The solum is 20 to 39 inches deep over strata of sand, gravel, or cobbles. The strata have more than 35 percent, by volume, gravel or cobbles. Rock fragments, dominantly of gravel size, are in the A and Bw horizons in some pedons, but they make up less than 35 percent of the volume. The depth to bedrock is more than 60 inches. Reaction is moderately acid to neutral. The number of mica flakes is few or common.

The Ap or A horizon has hue of 7.5YR or 10YR and value and chroma of 2 or 3.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The C horizon has hue of 10YR, value of 3 to 6, and chroma of 2 to 8 or is multicolored. It is sand, loamy sand, or loamy fine sand in the fine-earth fraction.

Rosman Series

These soils are very deep, well drained or moderately well drained, and moderately rapidly permeable. They formed in recent alluvium. They are on flood plains along large streams. Elevation generally ranges from 1,850 to 2,500 feet. Slope ranges from 0 to 2 percent. The soils are classified as coarse-loamy, mixed, mesic Fluventic Haplumbrepts.

Rosman soils are geographically associated with Biltmore and Statler soils. Biltmore soils are sandy and are on natural levees along the stream channels. Statler soils are fine-loamy and are on slightly elevated low stream terraces.

Typical pedon of Rosman fine sandy loam, 0 to 2 percent slopes, occasionally flooded; about 0.8 mile southeast of Whittier on Secondary Road 1397, about 500 feet north of the road, on a farm (State plane coordinates 638,000 feet N., 704,000 feet E.):

Ap—0 to 13 inches; dark brown (7.5YR 3/2) fine sandy loam; weak medium granular structure; very friable; common very fine and fine roots; common fine and medium tubular pores; 1 percent, by volume, rounded gravel; common fine flakes of mica; moderately acid; gradual smooth boundary.

C/A—13 to 24 inches; 70 percent reddish brown (5YR 4/4) and 30 percent dark brown (7.5YR 3/2) fine sandy loam; massive; very friable; common fine and very fine roots; common fine and medium tubular pores; 1 percent, by volume, rounded gravel; common fine flakes of mica; slightly acid; diffuse smooth boundary.

C—24 to 65 inches; brown (7.5YR 5/4) fine sandy loam; massive; very friable; few very fine and fine roots; common fine and medium tubular pores; common fine flakes of mica; slightly acid; gradual smooth boundary.

Ab—65 to 73 inches; very dark grayish brown (10YR 3/2) very fine sandy loam; common fine and medium distinct dark brown to brown (7.5YR 4/4) and common fine and medium faint light gray (N 7/0) and gray (N 5/0) mottles; weak fine and medium subangular blocky structure; friable; few very fine and fine roots; common fine and medium tubular pores; common fine flakes of mica; slightly acid.

The loamy sediments are 40 to 60 inches or more deep over strata of sand, gravel, and cobbles. These soils are mottled in chroma of 2 or less within a depth of 20 to 36 inches in some pedons. Reaction is strongly acid to slightly acid in unlimed areas. The number of mica flakes range from few to many. Strata of contrasting textures occur below a depth of 40 inches in some pedons.

The Ap or A horizon has hue of 7.5YR to 2.5Y, value of 3, and chroma of 1 to 3.

Some pedons have an Ab horizon. This horizon has hue of 7.5YR to 2.5Y, value of 3, and chroma of 1 to 3. It is very fine sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The C/A horizon, if it occurs, has hue of 7.5YR to 2.5Y, value of 3, and chroma of 1 to 3 in the A part of the horizon. The C part has hue of 5YR to 10YR, value of 4 to 6, and chroma of 4 to 8. This horizon is fine sandy loam or loam in the fine-earth fraction.

The C horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 4 to 8. In some pedons, mottles that have chroma of 2 or less are below a depth of 20 inches. This horizon is fine sandy loam or loam in the fine-earth fraction.

The Rosman soils in Jackson County are taxadjuncts because they have a base saturation of more than 50 percent throughout. However, this difference does not affect the overall use, management, and behavior of these soils.

Santeetlah Series

These soils are very deep, well drained, and moderately rapidly permeable. They formed in colluvium derived from metasedimentary rocks. They are on toe slopes and benches in coves. Elevation generally ranges from 2,000 to 4,800 feet. Slope ranges from 15 to 50 percent. The soils are classified as coarse-loamy, mixed, mesic Typic Haplumbrepts.

Santeetlah soils are geographically associated with Spivey soils, which are loamy-skeletal and are mixed with areas of the Santeetlah soils along drainageways.

Typical pedon of Santeetlah flaggy loam, in an area of Spivey-Santeetlah complex, 30 to 50 percent slopes, stony; about 4.3 miles northeast of Wilmot, 1.7 miles east of the confluence of the east and west forks of Dicks Creek on Secondary Road 1389 (State plane coordinates 545,500 feet N., 596,500 feet E.):

Oi—2 inches to 0; partly decomposed leaves, twigs, roots, and other deciduous plant material.

A1—0 to 6 inches; very dark brown (10YR 2/2) flaggy

loam; weak fine granular structure; very friable; many fine to coarse roots; 15 percent, by volume, flagstones and 5 percent, by volume, channers; few fine flakes of mica; very strongly acid; clear smooth boundary.

A2—6 to 12 inches; dark brown (10YR 3/3) flaggy loam; weak medium granular structure; very friable; many fine to coarse roots; 10 percent, by volume, flagstones and 5 percent, by volume, channers; common fine and medium flakes of mica; very strongly acid; clear wavy boundary.

Bw1—12 to 18 inches; dark yellowish brown (10YR 4/4) loam; weak medium subangular blocky structure; friable; few fine and medium roots; 5 percent, by volume, channers; common fine flakes of mica; strongly acid; gradual wavy boundary.

Bw2—18 to 28 inches; strong brown (7.5YR 4/6) loam; moderate medium subangular blocky structure; friable; few fine and medium roots; 5 percent, by volume, channers; common fine flakes of mica; strongly acid; gradual wavy boundary.

BC—28 to 60 inches; dark yellowish brown (10YR 4/6) channery fine sandy loam; weak medium subangular blocky structure; friable; few fine and medium roots; 15 percent, by volume, channers; common fine flakes of mica; strongly acid.

The thickness of the solum ranges from 30 to more than 60 inches. The depth to bedrock is more than 60 inches. In unlimed areas, reaction is extremely acid to moderately acid. The content of rock fragments, mainly channers or flagstones, may be as much as 35 percent, by volume, in the 10- to 40-inch control section and as much as 60 percent, by volume, below a depth of 40 inches. The number of mica flakes is few or common.

The A or Ap horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 to 3.

The Bw horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 8. It is fine sandy loam or loam in the fine-earth fraction.

Some pedons have a BC horizon. This horizon is similar in color and texture to the Bw horizon.

The C horizon, if it occurs, is multicolored colluvium. It is loamy sand, sandy loam, or fine sandy loam in the fine-earth fraction.

Saunook Series

These soils are very deep, well drained, and moderately permeable. They formed in colluvium derived from high-grade metamorphic rocks. They are on benches and toe slopes in coves. Elevation generally ranges from 2,000 to 3,500 feet. Slope ranges from 2 to 30 percent. The soils are classified as fine-loamy, mixed, mesic Humic Hapludults (fig. 22).

Saunook soils are geographically associated with Cowee, Evard, and Trimont soils. The associated soils formed in material that weathered from saprolite on the adjacent uplands. Cowee and Evard soils generally are on south- to west-facing slopes, and Trimont soils generally are on north- to east-facing side slopes. Also, Cowee soils are moderately deep to weathered bedrock.

Typical pedon of Saunook gravelly loam, 8 to 15 percent slopes; 8.0 miles south of Dillsboro, 0.8 mile east of the intersection of U.S. Highway 441 and Secondary Road 1318, about 300 feet north of Secondary Road 1318, in a hay field (State plane coordinates 740,000 feet N., 635,000 feet E.):

Ap—0 to 9 inches; dark brown (7.5YR 3/4) gravelly loam; moderate medium granular structure; very friable; many fine and medium roots; 15 percent, by volume, gravel and 5 percent, by volume, cobbles; few fine flakes of mica; slightly acid; clear wavy boundary.

Bt1—9 to 17 inches; strong brown (7.5YR 4/6) gravelly clay loam; dark brown (7.5YR 3/4) gravelly loam from the A horizon in old root channels; moderate medium subangular blocky structure; friable; common fine and medium roots; few discontinuous clay films on faces of peds; 15 percent, by volume, gravel and 5 percent, by volume, cobbles; few fine flakes of mica; moderately acid; gradual wavy boundary.

Bt2—17 to 24 inches; strong brown (7.5YR 5/6) gravelly sandy clay loam; weak medium subangular blocky structure; friable; common fine and few medium roots; few discontinuous clay films on faces of peds; 15 percent, by volume, gravel; few fine flakes of mica; moderately acid; gradual wavy boundary.

BC1—24 to 30 inches; strong brown (7.5YR 5/8) gravelly sandy loam; weak medium subangular blocky structure; very friable; few fine and medium roots; 20 percent, by volume, gravel and 5 percent, by volume, cobbles; few fine flakes of mica; moderately acid; gradual wavy boundary.

BC2—30 to 44 inches; strong brown (7.5YR 5/8) sandy loam; common medium distinct dark brown (7.5YR 4/4) mottles; weak medium subangular blocky structure; very friable; few fine and medium roots; 10 percent, by volume, cobbles; few fine flakes of mica; moderately acid; gradual wavy boundary.

C—44 to 60 inches; yellowish brown (10YR 5/6) cobbly fine sandy loam; massive; friable; 20 percent, by volume, cobbles and 5 percent, by volume, gravel; common fine flakes of mica; moderately acid.

The thickness of the solum is 40 to more than 60 inches. The depth to bedrock is more than 60 inches.

Reaction is extremely acid to moderately acid in the surface layer in unlimed areas. It ranges from very strongly acid to moderately acid below the A horizon. The number of mica flakes is few or common. The content of rock fragments ranges from 0 to 35 percent, by volume, in the A and Bt horizons and is as much as 60 percent, by volume, in the BC and C horizons.

The Ap or A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 2 to 4 or has hue of 7.5YR, value of 3, and chroma of 2 to 4.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 8. It is loam, sandy clay loam, or clay loam in the fine-earth fraction.

The BC horizon, if it occurs, is similar in color to the Bt horizon. It is fine sandy loam, sandy loam, loam, or sandy clay loam in the fine-earth fraction.

The C horizon, if it occurs, is yellowish brown or multicolored colluvium. It is sandy loam, fine sandy loam, loam, or loamy sand in the fine-earth fraction.

Soco Series

These soils are moderately deep, well drained, and moderately rapidly permeable. They formed in saprolite weathered from metasedimentary rocks. They generally are on ridgetops and south- to west-facing side slopes. Elevation generally ranges from 3,500 to 4,800 feet. Slope ranges from 15 to 95 percent. The soils are classified as coarse-loamy, mixed, mesic Typic Dystrochrepts.

Soco soils are geographically associated with Cheoah and Stecoah soils. The associated soils are deep to weathered bedrock. Also, Cheoah soils have an umbric epipedon and are generally on north- to east-facing side slopes.

Typical pedon of Soco channery loam, in an area of Soco-Stecoah complex, 30 to 50 percent slopes; 10 miles northeast of Cherokee on U.S. Highway 19 to Soco Gap, 5 miles northwest on the Blue Ridge Parkway to Barnett Knob Fire Tower Road, 500 feet southwest on Barnett Knob Fire Tower Road, 100 feet south of the road, in a wooded area (State plane coordinates 672,000 feet N., 742,000 feet E.):

Oi—1 inch to 0; partly decomposed organic matter, leaves, twigs, and roots.

A—0 to 4 inches; very dark grayish brown (10YR 3/2) channery loam; weak fine granular structure; very friable; many fine and medium roots; 5 percent, by volume, mostly metasandstone flagstones and 15 percent, by volume, phyllite channers; common fine flakes of mica; very strongly acid; clear wavy boundary.

Bw1—4 to 13 inches; strong brown (7.5YR 4/6) fine sandy loam; weak medium subangular blocky structure; friable; 5 percent, by volume, phyllite channers; common fine flakes of mica; strongly acid; clear wavy boundary.

Bw2—13 to 24 inches; dark yellowish brown (10YR 4/6) fine sandy loam; weak fine subangular blocky structure; friable; 5 percent, by volume, phyllite channers; few fine flakes of mica; very strongly acid; gradual wavy boundary.

BC—24 to 32 inches; yellowish brown (10YR 5/4) channery fine sandy loam; massive; friable; 20 percent, by volume, weathered phyllite channers; common fine flakes of mica; very strongly acid; gradual wavy boundary.

C—32 to 35 inches; brown (10YR 5/3), gray (10YR 6/1), and black (10YR 2/1) channery fine sandy loam that weathered from saprolite; weak coarse platy rock-controlled structure; friable; 25 percent, by volume, weathered phyllite channers; common fine flakes of mica; very strongly acid; clear wavy boundary.

Cr—35 to 60 inches; multicolored, weathered phyllite; few seams of multicolored fine sandy loam in cracks; partly consolidated but can be dug with difficulty by a spade.

The thickness of the solum ranges from 16 to 39 inches. The depth to a Cr horizon of weathered, fractured bedrock ranges from 20 to 40 inches. The depth to hard bedrock is more than 40 inches. Reaction is extremely acid to strongly acid in unlimed areas. The number of mica flakes is few or common. The content of rock fragments is as much as 35 percent, by volume, in the control section.

The A horizon has hue of 7.5YR to 2.5Y, value of 2 to 5, and chroma of 2 to 6. Where value is 2 or 3 and chroma is 1 to 3, the horizon is less than 7 inches thick.

The Bw horizon and the BC horizon, if it occurs, have hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 8. They are loam, fine sandy loam, or silt loam in the fine-earth fraction.

The C horizon, if it occurs, is multicolored saprolite weathered from metasedimentary rocks. It is loam, fine sandy loam, sandy loam, loamy fine sand, or silt loam in the fine-earth fraction.

The Cr horizon is multicolored, weathered metasedimentary rock that is partly consolidated but can be dug with difficulty by a spade.

Spivey Series

These soils are very deep, well drained, and moderately rapidly permeable. They formed in colluvium derived from metasedimentary rocks. They are on toe slopes and benches and along drainageways in coves. Elevation generally ranges from 2,000 to 4,800 feet. Slope ranges from 15 to 50 percent. The soils are

classified as loamy-skeletal, mixed, mesic Typic Haplumbrepts.

Spivey soils are geographically associated with Santeetlah soils, which are coarse-loamy and mixed with areas of the Spivey soils in coves and along toe slopes.

Typical pedon of Spivey flaggy loam, in an area of Spivey-Santeetlah complex, 30 to 50 percent slopes, stony; about 4.3 miles northeast of Wilmot, 1.7 miles east of the confluence of the east and west forks of Dicks Creek on Secondary Road 1389 (State plane coordinates 545,500 feet N., 596,500 feet E.):

Oi—2 inches to 0; partly decomposed leaves, twigs, roots, and other deciduous plant material.

A1—0 to 7 inches; very dark brown (10YR 2/2) flaggy loam; weak fine granular structure; very friable; many fine to coarse roots; 15 percent, by volume, flagstones and 15 percent, by volume, channers; few fine flakes of mica; very strongly acid; clear smooth boundary.

A2—7 to 13 inches; dark brown (10YR 3/3) flaggy loam; weak medium granular structure; very friable; many fine to coarse roots; 20 percent, by volume, flagstones and 10 percent, by volume, channers; few fine flakes of mica; very strongly acid; clear wavy boundary.

Bw1—13 to 18 inches; dark yellowish brown (10YR 4/4) very flaggy loam; weak medium subangular blocky structure; friable; few fine and medium roots; 30 percent, by volume, flagstones and 15 percent, by volume, channers; common fine flakes of mica; strongly acid; gradual wavy boundary.

Bw2—18 to 38 inches; strong brown (7.5YR 4/6) very flaggy fine sandy loam; weak medium subangular blocky structure; friable; few fine and medium roots; 30 percent, by volume, flagstones, 15 percent, by volume, channers, and 5 percent, by volume, stones; common fine flakes of mica; strongly acid; gradual wavy boundary.

BC—38 to 60 inches; yellowish brown (10YR 5/6) very flaggy fine sandy loam; weak medium subangular blocky structure; very friable; few fine and medium roots; 30 percent, by volume, flagstones, 10 percent, by volume, channers, and 10 percent, by volume, stones; common fine flakes of mica; strongly acid.

The thickness of the solum ranges from 30 to 60 inches or more. The depth to bedrock is more than 60 inches. Reaction is extremely acid to strongly acid in the A horizon in unlimed areas. It ranges from very strongly acid to moderately acid in the Bw horizon and the lower horizons. The number of mica flakes is few or common. The average content of rock fragments ranges from 35 to 70 percent, by volume, in the control section.

The A or Ap horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 to 3.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 8. It is loam or fine sandy loam in the fine-earth fraction.

The BC horizon, if it occurs, has colors similar to those in the Bw horizon. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The C horizon, if it occurs, is colluvium that is multicolored or similar in color to the Bw horizon. It is loam, sandy loam, or fine sandy loam in the fine-earth fraction.

Statler Series

These soils are very deep, well drained, and moderately permeable. They formed in old alluvium. They are on low stream terraces. Elevation generally ranges from 1,850 to 2,500 feet. Slope ranges from 1 to 5 percent. The soils are classified as fine-loamy, mixed, mesic Humic Hapludults.

Statler soils are geographically associated with Hemphill and Dillard soils. The associated soils are in depressions on low stream terraces. Hemphill soils are very poorly drained and slowly permeable. Dillard soils are moderately well drained and moderately permeable.

Typical pedon of Statler loam, 1 to 5 percent slopes, rarely flooded; about 1.3 miles north of Qualla on U.S. Highway 441 to the intersection of U.S. Highway 441 and Secondary Road 1406, about 150 feet northeast of Secondary Road 1406, in a field (State plane coordinates 581,100 feet N., 681,600 feet E.):

Ap—0 to 9 inches; dark brown (10YR 3/3) loam; weak fine granular structure; very friable; common fine and medium roots; few fine flakes of mica; slightly acid; clear wavy boundary.

Bt1—9 to 30 inches; yellowish brown (10YR 5/6) clay loam; moderate medium subangular blocky structure; friable; few discontinuous clay films on faces of peds; common fine flakes of mica; moderately acid; gradual wavy boundary.

Bt2—30 to 62 inches; yellowish brown (10YR 5/6) sandy clay loam; few fine prominent yellowish red (5YR 5/6) and common medium distinct light yellowish brown (10YR 6/4) mottles; moderate medium subangular blocky structure; friable; few discontinuous clay films on faces of peds; common fine flakes of mica; strongly acid; gradual wavy boundary.

BC—62 to 70 inches; strong brown (7.5YR 4/6) fine sandy loam; few fine prominent yellowish red (5YR 5/8) and common medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular

blocky structure; friable; common fine flakes of mica; strongly acid; gradual wavy boundary.
C—70 to 85 inches; multicolored alluvium that has a texture of fine sandy loam; massive; very friable; common fine flakes of mica; strongly acid.

The thickness of the solum ranges from 30 to 80 inches. Reaction is moderately acid or strongly acid in unlimed areas. In limed areas, reaction is slightly acid to neutral in the A horizon and the upper part of the Bt horizon. The number of mica flakes is few or common. Rock fragments, dominantly of gravel size, are in some horizons in some pedons, but they make up less than 35 percent of the volume.

The Ap or A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 2 to 4.

The Bt horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 3 to 8. It is loam, sandy clay loam, or clay loam in the fine-earth fraction.

The BC horizon, if it occurs, is similar in color to the Bt horizon. It is fine sandy loam or loam in the fine-earth fraction.

The C horizon, if it occurs, is multicolored alluvium. It is fine sandy loam or loam in the fine-earth fraction.

Stecoah Series

These soils are deep, well drained, and moderately rapidly permeable. They formed in saprolite weathered from metasedimentary rocks. They generally are on ridgetops and south- to west-facing side slopes. Elevation generally ranges from 2,000 to 4,800 feet. Slope ranges from 15 to 95 percent. The soils are classified as coarse-loamy, mixed, mesic Typic Dystrochrepts.

Stecoah soils are geographically associated with Cheoah and Soco soils. Soco soils are moderately deep to weathered bedrock and are intermingled with areas of the Stecoah soils. Cheoah soils are on north- to east-facing slopes and have an umbric epipedon.

Typical pedon of Stecoah channery fine sandy loam, in an area of Soco-Stecoah complex, 30 to 50 percent slopes; 10 miles northeast of Cherokee on U.S. Highway 19 to Soco Gap, 5 miles northwest on the Blue Ridge Parkway to Barnett Knob Fire Tower Road, 700 feet southwest on Barnett Knob Fire Tower Road, 300 feet south of the road, in a wooded area (State plane coordinates 672,000 feet N., 742,000 feet E.):

Oi—1 inch to 0; partly decomposed leaves, twigs, roots, and other deciduous plant material.
A—0 to 5 inches; very dark grayish brown (10YR 3/2) channery fine sandy loam; weak fine granular structure; very friable; many fine to coarse roots; 15 percent, by volume, channers and 5 percent, by volume, flagstones; few fine flakes of mica; very strongly acid; clear smooth boundary.
Bw1—5 to 10 inches; dark brown (7.5YR 4/4) fine sandy loam; weak medium subangular blocky structure; friable; common fine to coarse roots; 5 percent, by volume, channers; common fine flakes of mica; very strongly acid; gradual wavy boundary.
Bw2—10 to 17 inches; strong brown (7.5YR 4/6) fine sandy loam; weak medium subangular blocky structure; very friable; common fine and medium roots; 5 percent, by volume, channers; common fine flakes of mica; very strongly acid; gradual wavy boundary.
Bw3—17 to 22 inches; strong brown (7.5YR 5/8) fine sandy loam; weak medium subangular blocky structure; very friable; few fine and medium roots; 10 percent, by volume, channers; common fine flakes of mica; very strongly acid; gradual wavy boundary.
Bw4—22 to 36 inches; strong brown (7.5YR 5/6) channery fine sandy loam; weak medium subangular blocky structure; very friable; few fine and medium roots; 20 percent, by volume, channers; common fine flakes of mica; very strongly acid.
BC—36 to 45 inches; strong brown (7.5YR 5/6) channery fine sandy loam; weak medium subangular blocky structure; very friable; few fine and medium roots; 25 percent, by volume, channers and 5 percent, by volume, flagstones; common fine flakes of mica; very strongly acid; abrupt irregular boundary.
Cr—45 to 60 inches; multicolored, weathered, interbedded metasandstone and phyllite; few thin seams of strong brown (7.5YR 5/6) fine sandy loam saprolite in rock fractures; black (10YR 2/1) manganese coatings along rock fractures.

The thickness of the solum ranges from 30 to 50 inches. The depth to weathered, fractured bedrock is 40 to 60 inches. The depth to hard bedrock is more than 60 inches. The content of rock fragments ranges from 0 to 35 percent, by volume. Reaction is extremely acid to strongly acid in unlimed areas. The number of mica flakes is few or common.

The A horizon has hue of 7.5YR to 2.5Y, value of 2 to 5, and chroma of 2 to 6. Where value and chroma are 2 or 3, the horizon is less than 7 inches thick.

The Bw horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 8. It is fine sandy loam, silt loam, or loam in the fine-earth fraction.

Some pedons have a BC horizon. This horizon is similar in color and texture to the Bw horizon.

The C horizon, if it occurs, is multicolored saprolite

weathered from metasedimentary rocks. It is sandy loam, fine sandy loam, silt loam, or loam in the fine-earth fraction.

The Cr horizon is multicolored, weathered metasandstone and phyllite.

Sylva Series

These soils are very deep, poorly drained, and moderately rapidly permeable. They formed in colluvium or alluvium derived from high-grade metamorphic rocks. They are on colluvial flats in coves. Elevation generally ranges from 2,500 to 4,800 feet. Slope ranges from 0 to 2 percent. The soils are classified as coarse-loamy, mixed, acid, mesic Humic Haplaquepts.

Sylva soils are geographically associated with Nikwasi, Tuckasegee, and Whiteside soils. Nikwasi soils formed in recent alluvium that is moderately deep to strata of sand, gravel, and cobbles. These soils are subject to flooding. Tuckasegee soils are well drained, and Whiteside soils are moderately well drained. They are mixed with areas of the Sylva soils on nearly level colluvial fans. Whiteside and Tuckasegee soils have an umbric epipedon. Also, Whiteside soils have an argillic horizon and are fine-loamy.

Typical pedon of Sylva loam, in an area of Sylva-Whiteside complex, 0 to 2 percent slopes; 0.25 mile south of Cashiers on Cashiers Lake Road, 0.5 mile west of the intersection of North Carolina Highway 107 and Cashiers Lake Road (State plane coordinates 517,000 feet N., 776,000 feet E.):

Oi—2 inches to 0; partly decomposed leaves, twigs, roots, and other deciduous plant material.

A1—0 to 4 inches; black (N 2/0) loam; weak medium granular structure; very friable; many fine and medium and few coarse roots; few fine flakes of mica; very strongly acid; clear smooth boundary.

A2—4 to 8 inches; very dark grayish brown (2.5Y 3/2) loam; common medium prominent dark yellowish brown (10YR 4/4) and common medium faint dark grayish brown (2.5Y 4/2) and very dark gray (10YR 3/1) streaks; weak medium subangular blocky structure; friable; common fine and medium roots; common fine flakes of mica; strongly acid; clear irregular boundary.

Bg1—8 to 20 inches; light gray (2.5Y 7/2) loam; weak medium subangular blocky structure; friable; few fine roots; common fine flakes of mica; very strongly acid; gradual wavy boundary.

Bg2—20 to 37 inches; light gray (2.5Y 7/2) sandy loam; weak medium subangular blocky structure; friable; few medium roots; common fine flakes of mica; very strongly acid; gradual wavy boundary.

Cg—37 to 65 inches; light brownish gray (2.5Y 6/2) loam; massive; friable; common fine flakes of mica; very strongly acid.

The thickness of the solum ranges from 22 to 40 inches. The depth to bedrock is more than 60 inches. Reaction is extremely acid to strongly acid in unlimed areas. The number of mica flakes ranges from few to many. The content of rock fragments, mainly gravel, is as much as 15 percent, by volume.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 2 or 3, and chroma of 1 to 3, or it is neutral in hue and has value of 2 or 3.

The Bg horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2, or it is neutral in hue and has value of 4 to 6. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction. In some pedons, it has thin layers, lenses, or pockets of silty clay loam, sandy clay loam, or loamy sand.

The Cg horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2, or it is neutral in hue and has value of 4 to 7. It is sandy loam, fine sandy loam, loam, loamy sand, or loamy fine sand. In some pedons, it has thin layers of silty clay loam, sandy clay loam, or clay loam.

Tanasee Series

These soils are very deep, well drained, and moderately rapidly permeable. They formed in colluvium derived from high-grade metamorphic rocks. They are in coves and gaps. Elevation is generally above 4,800 feet. Slope ranges from 8 to 50 percent. The soils are classified as coarse-loamy, mixed, frigid Typic Haplumbrepts.

Tanasee soils are geographically associated with Balsam soils, which are loamy-skeletal and are mixed with areas of the Tanasee soils in coves and gaps.

Typical pedon of Tanasee sandy loam, in an area of Tanasee-Balsam complex, 15 to 30 percent slopes, stony; about 15 miles south of Waynesville on U.S. Highway 276 and North Carolina Highway 215, about 6.2 miles northeast along the Blue Ridge Parkway from its intersection with North Carolina Highway 215, about 150 feet southwest of the Blue Ridge Parkway at Reinhart Gap (State plane coordinates 810,000 feet N., 590,000 feet E.):

Oi—2 inches to 0; partly decomposed leaves, twigs, roots, and other deciduous plant material.

A1—0 to 7 inches; black (10YR 2/1) sandy loam; weak fine and medium granular structure; very friable; many fine to coarse roots; 8 percent, by volume, rock fragments, mainly cobbles; few fine flakes of mica; extremely acid; gradual wavy boundary.

A2—7 to 13 inches; very dark brown (10YR 2/2) sandy

loam; weak fine and medium granular structure; very friable; common fine to coarse roots; 8 percent, by volume, rock fragments, mainly cobbles; few fine flakes of mica; very strongly acid; clear wavy boundary.

Bw—13 to 31 inches; yellowish brown (10YR 5/8) sandy loam; weak fine and medium subangular blocky structure; very friable; common fine to coarse roots; 14 percent, by volume, rock fragments, mainly cobbles; common fine flakes of mica; very strongly acid; gradual wavy boundary.

C1—31 to 51 inches; dark yellowish brown (10YR 4/6) cobbly loamy coarse sand; massive; very friable; few fine and medium roots; 30 percent, by volume, rock fragments, mainly cobbles and gravel and a few stones; common fine and medium flakes of mica; very strongly acid; gradual wavy boundary.

C2—51 to 65 inches; multicolored gravelly loamy sand that weathered from saprolite; massive; very friable; 16 percent, by volume, rock fragments, mainly gravel and a few cobbles; common fine and medium flakes of mica; very strongly acid.

The thickness of the solum ranges from 24 to 50 inches. The depth to bedrock is more than 60 inches. Reaction is extremely acid to strongly acid. The number of mica flakes is few or common. The content of rock fragments is as much as 35 percent, by volume, in the upper 40 inches and as much as 60 percent, by volume, below a depth of 40 inches.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 to 3 or has hue of 7.5YR, value of 2 or 3, and chroma of 0 to 2.

The Bw horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 8. It is fine sandy loam, loam, or sandy loam in the fine-earth fraction.

The C horizon varies in color and consists of loamy or sandy colluvium derived from high-grade metamorphic rocks.

Trimont Series

These soils are very deep, well drained, and moderately permeable (fig. 23). They formed in saprolite weathered from high-grade metamorphic rocks. They are generally on north- to east-facing side slopes. Elevation generally ranges from 2,000 to 3,500 feet. Slope ranges from 30 to 95 percent. The soils are classified as fine-loamy, mixed, mesic Humic Hapludults.

Trimont soils are geographically associated with Cowee, Evard, and Saunook soils. Cowee and Evard soils are not in the Humic Hapludult subgroup and are generally on south- to west-facing side slopes. Also, Cowee soils are moderately deep to weathered bedrock. Saunook soils formed on benches or toe slopes in coves.

Typical pedon of Trimont gravelly loam, 50 to 95 percent slopes, stony; about 0.25 mile south of Sylva on Buck Mountain, 800 feet southeast of the Sylva television relay tower (State plane coordinates 620,000 feet N., 740,000 feet E.):

Oi—2 inches to 0; partly decomposed leaves, twigs, roots, and other deciduous plant material.

A1—0 to 3 inches; dark brown (7.5YR 3/2) gravelly loam; weak fine granular structure; very friable; many fine and medium and common coarse roots; 15 percent, by volume, gravel and 3 percent, by volume, cobbles; common fine flakes of mica; strongly acid; clear wavy boundary.

A2—3 to 10 inches; dark brown (7.5YR 3/4) gravelly loam; weak fine granular structure; very friable; common fine and medium and few coarse roots; 12 percent, by volume, gravel and 3 percent, by volume, cobbles; common fine flakes of mica; strongly acid; clear wavy boundary.

Bt1—10 to 17 inches; reddish brown (5YR 4/4) loam; weak medium subangular blocky structure; friable; common fine and medium roots; few discontinuous clay films on faces of peds; 10 percent, by volume, gravel; common fine flakes of mica; strongly acid; gradual wavy boundary.

Bt2—17 to 40 inches; yellowish red (5YR 4/6) clay loam; moderate medium subangular blocky structure; friable; few fine and medium roots; few discontinuous clay films on faces of peds; 10 percent, by volume, gravel; common fine flakes of mica; moderately acid; gradual wavy boundary.

BC—40 to 65 inches; yellowish red (5YR 5/6) loam; weak medium subangular blocky structure; friable; few fine and medium roots; 10 percent, by volume, gravel; common fine flakes of mica; common distinct black (10YR 2/1) manganese stains; moderately acid.

The thickness of the solum is 30 to more than 60 inches. The depth to hard bedrock is more than 60 inches. Reaction is very strongly acid to moderately acid in unlimed areas. The number of mica flakes is few or common. The content of rock fragments ranges from 0 to 35 percent, by volume.

The A horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 2 to 4. However, no combination of value, chroma, and thickness can qualify for an umbric epipedon.

The Bt horizon has hue of 2.5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8. It is loam, sandy clay loam, or clay loam in the fine-earth fraction.

The BC horizon has colors similar to those of the Bt

horizon. It is loam, fine sandy loam, or sandy loam in the fine-earth fraction.

The C horizon, if it occurs, is multicolored saprolite weathered from high-grade metamorphic rocks. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

Tsali Series

These soils are shallow, well drained, and moderately permeable (fig. 24). They formed in saprolite weathered from metasedimentary rocks, especially phyllite. They are generally on ridgetops and south- to west-facing side slopes. Elevation generally ranges from 1,900 to 3,500 feet. Slope ranges from 15 to 95 percent. The soils are classified as loamy, mixed, mesic, shallow Typic Hapludults.

Tsali soils are geographically associated with Brasstown and Junaluska soils. Brasstown soils are deep to weathered bedrock and are on concave head slopes. Junaluska soils are moderately deep to weathered bedrock and are intermingled with areas of the Tsali soils.

Typical pedon of Tsali channery fine sandy loam, in an area of Junaluska-Tsali complex, 50 to 95 percent slopes; about 3.8 miles northwest of Dillsboro on U.S. Highway 441, about 0.5 mile northeast of the intersection of U.S. Highway 441 and the access road to the Smoky Mountain Mental Health Center, 600 feet west of the woodworking shop at the center (State plane coordinates 630,000 feet N., 723,000 feet E.):

Oi—3 inches to 0; partly decomposed pine needles, twigs, roots, and other plant material.

A—0 to 3 inches; dark brown (10YR 4/3) channery fine sandy loam; weak fine granular structure; very friable; many fine to coarse roots; 20 percent, by volume, channers; common fine flakes of mica; very strongly acid; clear wavy boundary.

BA—3 to 6 inches; brown (7.5YR 4/4) channery fine sandy loam; weak fine subangular blocky structure; friable; many fine to coarse roots; 20 percent, by volume, channers; common fine flakes of mica; strongly acid; gradual wavy boundary.

Bt—6 to 16 inches; yellowish red (5YR 5/8) channery loam; weak medium subangular blocky structure; friable; common fine and medium roots; few discontinuous clay films on faces of peds; 25 percent, by volume, channers; common fine and medium flakes of mica; strongly acid; clear irregular boundary.

Cr—16 to 40 inches; multicolored, weathered, fractured phyllite; few thin seams of yellowish red (5YR 5/8) loam in rock fractures.

The thickness of the solum ranges from 12 to 19 inches. The depth to weathered bedrock is 12 to 20 inches. The depth to hard bedrock is more than 30 inches. Reaction is extremely acid to strongly acid. The number of mica flakes is few or common. The content of rock fragments, dominantly of channer size, ranges from 15 to 35 percent, by volume.

The A horizon has hue of 5YR to 10YR, value of 3 to 5, and chroma of 3 to 8. Where value is 3 and chroma is 3 or 4, the horizon is less than 6 inches thick.

The BA horizon, if it occurs, has hue of 5YR or 7.5YR, value of 4 to 6, and chroma of 4 to 8. It is fine sandy loam or loam in the fine-earth fraction.

The Bt horizon has hue of 2.5YR to 10YR, value of 4 to 6, and chroma of 4 to 8. It is loam, sandy clay loam, or clay loam in the fine-earth fraction.

The Cr horizon is multicolored, weathered, fractured metasedimentary rocks, especially phyllite, that are partly consolidated.

Tuckasegee Series

These soils are very deep, well drained, and moderately rapidly permeable (fig. 25). They formed in colluvium derived from high-grade metamorphic rocks. They are on benches and toe slopes in coves. Elevation generally ranges from 3,500 to 4,800 feet. Slope ranges from 2 to 90 percent. The soils are classified as fine-loamy, mixed, mesic Typic Haplumbrepts.

Tuckasegee soils are geographically associated with Cullasaja and Whiteside soils. The associated soils are mixed with areas of the Tuckasegee soils in coves and on benches and toe slopes. Cullasaja soils are loamy-skeletal. Whiteside soils are moderately well drained.

Typical pedon of Tuckasegee gravelly loam, in an area of Cullasaja-Tuckasegee complex, 30 to 50 percent slopes, stony; about 5 miles northeast of Cullowhee near the headwaters of Moses Creek at Jackie Spring Gap, 700 feet west of a U.S. Forest Service access road (State plane coordinates 604,000 feet N., 782,000 feet E.):

Oi—2 inches to 0; partly decomposed leaves, twigs, roots, and other deciduous plant material.

A—0 to 11 inches; very dark brown (10YR 2/2) gravelly loam; weak fine granular structure; very friable; many fine and medium and few coarse roots; 15 percent, by volume, gravel and 5 percent, by volume, cobbles; few fine flakes of mica; very strongly acid; gradual wavy boundary.

Bw1—11 to 16 inches; dark yellowish brown (10YR 4/4) loam; weak medium subangular blocky structure; friable; common fine and medium roots; 10 percent, by volume, gravel; few fine flakes of mica; strongly acid; gradual wavy boundary.

Bw2—16 to 24 inches; dark yellowish brown (10YR 4/4) gravelly loam; weak medium subangular blocky structure; friable; few fine and medium roots; 15 percent, by volume, gravel and 2 percent, by volume, cobbles; common fine flakes of mica; strongly acid; gradual wavy boundary.

Bw3—24 to 44 inches; yellowish brown (10YR 5/8) gravelly fine sandy loam; weak medium subangular blocky structure; friable; few fine and medium roots; 15 percent, by volume, gravel and 5 percent, by volume, cobbles; common fine flakes of mica; strongly acid; gradual wavy boundary.

BC—44 to 60 inches; yellowish brown (10YR 5/8) gravelly sandy clay loam; weak medium subangular blocky structure; friable; few fine and medium roots; 20 percent, by volume, gravel and 5 percent, by volume, cobbles; common fine flakes of mica; strongly acid.

The thickness of the solum ranges from 40 to more than 60 inches. The depth to bedrock is more than 72 inches. Reaction is very strongly acid to moderately acid in unlimed areas. The number of mica flakes is few or common. The content of rock fragments is as much as 35 percent, by volume, in the upper 40 inches and as much as 60 percent, by volume, below a depth of 40 inches.

The A or Ap horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 to 3.

Some pedons have an AB horizon. This horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4 but does not meet the color requirements for an umbric epipedon. It is loam, fine sandy loam, or sandy loam in the fine-earth fraction.

The Bw horizon has hue of 7.5YR or 10YR, value of 3 to 6, and chroma of 4 to 8. It is fine sandy loam, loam, sandy loam, or sandy clay loam in the fine-earth fraction.

The BC horizon, if it occurs, has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 8. It is fine sandy loam, sandy loam, sandy clay loam, or loam in the fine-earth fraction.

The C horizon, if it occurs, is colluvium derived from high-grade metamorphic rocks. It is similar in color to the BC horizon or is multicolored. It is fine sandy loam, loam, sandy loam, coarse sandy loam, loamy fine sand, loamy sand, or loamy coarse sand in the fine-earth fraction.

Udorthents

Udorthents consists of areas where the natural soil has been altered by excavation or covered by earthy fill material. These areas are well drained or moderately well drained. The excavated areas are mainly borrow pits from which the soil has been removed and used as foundation material for roads and buildings.

In most excavated areas, the exposed material is sandy loam, loamy sand, or loam. The fill areas are sites where at least 20 inches of loamy, earthy material covers borrow pits, landfills, natural drainageways, or low-lying areas. Slope ranges from nearly level to very steep, and some areas are undulating.

A typical pedon is not given for these soils because they vary. The depth to bedrock varies greatly. The fill areas are more than 20 inches deep and are as much as 100 feet deep in some areas. Landfills have layers of nonsoil material covered by loamy soil material.

The Udorthents have colors in shades of red, brown, yellow, and gray. The texture varies but typically is loamy. Reaction ranges from extremely acid to slightly acid.

Wayah Series

These soils are very deep, well drained, and moderately rapidly permeable. They formed in saprolite weathered from high-grade metamorphic rocks. They are on ridges and side slopes. Elevation is generally above 4,800 feet. Slope ranges from 8 to 95 percent. The soils are classified as coarse-loamy, mixed, frigid Typic Haplumbrepts.

Wayah soils are geographically associated with Burton and Craggey soils. The associated soils are on narrow ridgetops or side slopes near areas of rock outcrop. Burton soils are moderately deep to bedrock, and Craggey soils are shallow to bedrock.

Typical pedon of Wayah sandy loam, 15 to 30 percent slopes, stony; 10 miles northeast of Cullowhee along the Blue Ridge Parkway to the Richland Balsam Exhibit, 200 feet west of the parkway, in a wooded area (State plane coordinates 800,000 feet N., 630,000 feet E.):

Oi—4 to 2 inches; slightly decomposed needles and twigs.

Oe—2 inches to 0; partly decomposed organic litter and root mat.

A1—0 to 10 inches; black (10YR 2/1) sandy loam; weak fine granular structure; very friable; common fine and medium roots; 2 percent, by volume, gravel; few fine flakes of mica; 18 percent organic matter; extremely acid; clear wavy boundary.

A2—10 to 14 inches; very dark grayish brown (10YR 3/2) sandy loam; weak medium granular structure; very friable; common fine and medium roots; 2 percent, by volume, gravel; few fine flakes of mica; 7 percent organic matter; very strongly acid; clear wavy boundary.

Bw—14 to 40 inches; dark yellowish brown (10YR 4/6)

gravelly sandy loam; weak medium subangular blocky structure; very friable; few fine roots; 33 percent, by volume, gravel; few fine flakes of mica; very strongly acid; gradual wavy boundary.

C1—40 to 46 inches; pale brown (10YR 6/3) gravelly sandy loam that weathered from gneiss saprolite; few medium faint light gray (10YR 7/2) and white (10YR 8/2) mottles; massive rock-controlled structure; very friable; 16 percent, by volume, gravel; few fine flakes of mica; very strongly acid; gradual wavy boundary.

C2—46 to 65 inches; mottled yellowish brown (10YR 5/8), yellowish red (5YR 5/6), white (10YR 8/2), and pale brown (10YR 6/3) gravelly sandy loam that weathered from gneiss saprolite; massive rock-controlled structure; very friable; 17 percent, by volume, gravel; few fine flakes of mica; very strongly acid.

The thickness of the solum ranges from 20 to 50 inches. The depth to bedrock is more than 60 inches. The content of rock fragments is as much as 35 percent, by volume. Reaction is extremely acid to strongly acid. The number of mica flakes is few or common.

The A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 to 3.

The Bw horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 8. It is sandy loam, fine sandy loam, or loam in the fine-earth fraction.

The BC horizon, if it occurs, is similar in color and texture to the Bw horizon.

The C horizon is multicolored saprolite weathered from high-grade metamorphic rocks. It is fine sandy loam, sandy loam, coarse sandy loam, or loamy sand in the fine-earth fraction.

Whiteside Series

These soils are very deep, moderately well drained, and moderately permeable. They formed in colluvium derived from high-grade metamorphic rocks. They are on colluvial flats and toe slopes in coves. Elevation generally ranges from 2,500 to 4,800 feet. Slope ranges from 1 to 15 percent. The soils are classified as fine-loamy, mixed, mesic Aquic Hapludults.

Whiteside soils are geographically associated with Sylva and Tuckasegee soils. Tuckasegee soils are well drained and are on elevated knolls. Sylva soils are poorly drained and are in nearly level depressions. Also, Sylva soils are coarse-loamy.

Typical pedon of Whiteside fine sandy loam, in an area of Whiteside-Tuckasegee complex, 2 to 8 percent slopes; 7.3 miles south of Speedwell on Secondary Road 1157 to Double Spring Church, 300 feet northwest of Secondary Road 1157, in a field (State plane coordinates 517,000 feet N., 776,000 feet E.):

Ap—0 to 14 inches; very dark grayish brown (10YR 3/2) fine sandy loam; weak medium granular structure; very friable; common fine and medium roots; 10 percent, by volume, gravel; common fine flakes of mica; slightly acid; abrupt smooth boundary.

Bt1—14 to 24 inches; yellowish brown (10YR 5/6) sandy clay loam; common streaks of very dark grayish brown (10YR 3/2) in old root channels; weak medium subangular blocky structure; very friable; few fine roots; common fine flakes of mica; slightly acid; clear wavy boundary.

Bt2—24 to 30 inches; yellowish brown (10YR 5/4) sandy clay loam; common medium distinct strong brown (7.5YR 5/8) and gray (10YR 6/1) mottles; weak medium subangular blocky structure; friable; few fine roots; common fine flakes of mica; moderately acid; clear wavy boundary.

BCg—30 to 47 inches; gray (10YR 6/1) fine sandy loam; common medium distinct yellowish brown (10YR 5/8) and common medium faint gray (10YR 5/1) mottles; weak medium subangular blocky structure; friable; few fine roots; common fine to coarse flakes of mica; moderately acid; gradual wavy boundary.

Cg1—47 to 53 inches; light brownish gray (10YR 6/2) sandy loam; common medium distinct brownish yellow (10YR 6/6) mottles; massive; very friable; few fine flakes of mica; very strongly acid; gradual wavy boundary.

Cg2—53 to 70 inches; gray (10YR 6/1) sandy clay loam; common medium distinct yellowish brown (10YR 5/8) mottles; common thin lenses and pockets of light brownish gray (10YR 6/2) loamy sand; massive; firm; few fine flakes of mica; strongly acid.

The thickness of the solum ranges from 30 to 60 inches. The depth to bedrock is more than 72 inches. Reaction is very strongly acid to moderately acid in unlimed areas. The number of mica flakes ranges from few to many. The content of rock fragments, mainly gravel, is typically 0 to 15 percent, by volume, but ranges to as much as 35 percent, by volume, in some pedons.

The Ap or A horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 to 3.

The Bt horizon has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 3 to 8. It is mottled in chroma of 2 or less within 24 inches of the upper boundary of the horizon. It is loam, sandy clay loam, fine sandy loam, or sandy loam in the fine-earth fraction.

The BCg horizon, if it occurs, has hue of 10YR or

2.5Y, value of 4 to 7, and chroma of 1 or 2. The BC horizon, if it occurs, is similar in color to the Bt horizon. The BCg and BC horizons are loam, fine sandy loam, or sandy loam in the fine-earth fraction.

The Cg horizon and the C horizon, if it occurs, are colluvium or alluvium that is similar in color to the BCg and BC horizons, respectively. They vary in texture, ranging from sandy clay loam to loamy sand in the fine-earth fraction. The sandy textures, if they occur, are below a depth of 40 inches.

Formation of the Soils

Soils are formed by processes of the environment acting on geologic parent material. In Jackson County, the major geologic materials are high-grade, metamorphic, metasedimentary, and ultramafic rocks and the colluvium and alluvium derived from these rocks. The characteristics of a soil are determined by the combined influence of parent material, climate, plant and animal life, relief, and time. These five factors are responsible for the profile development and chemical properties that differentiate soils *(6)*.

Parent Material

Parent material is the unconsolidated mass in which a soil forms. In Jackson County, parent material is a major factor in determining what kind of soil forms and it can be correlated to some degree to geologic formations. The general soil map is an approximate guide to the geology of the county.

The soils in the Evard-Cowee-Saunook-Trimont, Plott-Edneyville-Chestnut-Cullasaja, Cleveland-Rock outcrop-Chestnut, Whiteside-Tuckasegee-Nikwasi, and Wayah general soil map units formed in material weathered from high-grade metamorphic rocks, such as hornblende gneiss, gneiss, and mica gneiss. The soils in the Junaluska-Brasstown-Tsali, Soco-Stecoah-Cheoah, and Oconaluftee general soil map units formed in material weathered from metasedimentary rocks, such as metasandstone, phyllite, and slate. The soils in the Ellijay general soil map unit formed in material weathered from ultramafic rocks, such as dunite. The soils in the Chandler-Fannin-Cashiers general soil map unit formed in material weathered from high-grade metamorphic rocks that are very high in content of mica, such as mica schist and mica gneiss. The soils in the Braddock-Nikwasi-Dellwood-Cullowhee general soil map unit formed in alluvium deposited by streams.

Climate

Climatic factors, particularly precipitation and temperature, affect the physical, chemical, and biological relationships of soil horizons. They influence the rates at which rocks weather and organic matter decomposes. The amount of leaching in a soil is related to the amount of rainfall and the movement of water through the soil. The effects of climate also control the kinds of plants and animals that can thrive in a region. Temperature influences the kinds of organisms in a region and their growth. It also influences the speed of chemical and physical reactions in the soil.

In Jackson County, the climate varies greatly in relation to elevation and landscape position. For example, annual rainfall varies significantly in the county. It averages from about 50 inches near the town of Cullowhee to 100 inches south of Cashiers. In some areas that have a high amount of rainfall, the rate of precipitation may exceed the rate of evapotranspiration in every month of most years. Localized microclimates are important in the soil-forming processes in the county. The climate at any single place is influenced by elevation, aspect, and location to the moisture-rich winds from the Gulf of Mexico.

The higher rainfall and cooler temperatures in the high mountains produce brown, medium textured soils that have a high content of organic matter in the surface layer. The warmer temperatures in the low mountains produce soils that are redder than those in the high mountains and that contain more clay in the subsoil.

Plant and Animal Life

Plants and animals influence the formation and differentiation of soil horizons. The kind and number of organisms in and on the soil are determined partly by climate and partly by the nature of the soil material, the relief, and the age of the soil. Bacteria, fungi, and other micro-organisms aid in the weathering of rocks and in the decomposition of organic matter. The plants and animals that live on a soil are the primary source of organic material.

Plants generally determine the kinds and amounts of organic matter that enter a soil under normal conditions and how the organic matter is added. They also concentrate readily available forms of essential elements in the surface through the nutrient cycle.

Generally, the soils in Jackson County formed under a hardwood forest. Trees take up elements from the subsoil. They add organic matter to the surface layer by

depositing leaves, roots, twigs, and eventually branches and trunks. The material is then acted on by organisms and undergoes chemical reactions. In the county, plants do not bring enough base material to the surface layer to counteract the effects of acidification.

Animals convert complex compounds into simpler forms, add organic material to the soil, and modify certain chemical and physical properties. In the county, most of the organic material accumulates on the surface. It is acted on by micro-organisms, fungi, earthworms, and other forms of life and by direct chemical reaction. It is then mixed with the uppermost mineral part of the soil by the activities of earthworms and other small invertebrates.

Generally, organic material decomposes more rapidly in the soils in the low mountains that have moderate temperatures and direct sunlight. Although organic matter is produced more rapidly in these soils, a lower content is present than in those soils at cooler, higher elevations because the soils in high mountains or on aspects shaded from direct sunlight can maintain a high content of organic matter in their surface layer.

Relief

Relief influences drainage, surface runoff, temperature, and the extent of geologic erosion. In Jackson County, relief varies greatly. Slopes range from 0 to 95 percent in the county.

Steeply sloping relief increases runoff and thus reduces percolation of water through the soil. Relief can also affect drainage. For example, a high water table generally is related to nearly level or gently sloping soils. Alluvial and colluvial soils are commonly less sloping than soils in the uplands. They receive runoff from the surrounding uplands. Examples are Dellwood and Saunook soils.

Soil creep is an important factor affecting soil formation in mountainous areas. Generally, the upper part of most of the soils on side slopes formed in material that is slowly moving downslope from the higher areas. Soils that formed on ridgetops and shoulder slopes are much less affected by soil creep. These areas may be the only landscape positions where the soils are completely residual. Generally, soil depth increases downslope, especially on concave surfaces. The maximum soil thickness is on colluvial landscape positions in coves and along toe slopes.

Time

The length of time that soil material has been exposed to the soil-forming processes accounts for some differences in the formation of the soils. The formation of a well defined soil profile, however, depends on other factors. Less time is required for a soil profile to develop in a warm climate than in a cool climate.

The soils in Jackson County vary considerably in age. The length of the time that a soil has been forming is reflected in the profile. Old soils generally have more clay movement and accumulation in their horizons than young soils. In the county, the effects of time as a soil-forming factor are more apparent in the older soils, such as Braddock soils, which are on the broader parts of high stream terraces. Young soils along streams, such as Reddies and Rosman soils, have more sand and may be underlain by strata of sand, gravel, and cobbles. Other soils in the county, such as Cullasaja soils, are considered young because of their landscape position. Cullasaja soils are not well developed because they are on strongly sloping to very steep landscapes and are receiving material from geologic erosion.

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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.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

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.

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.

Aspect. The direction in which a slope faces. Generally, cool aspects are north- and east-facing and warm aspects are south- and west-facing.

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 plastic limit (PL), 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

Bald. A grass and shrub covered summit or other elevated area that is naturally bare of forests.

Balled and burlapped. 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 harvested. 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 cross-sectional area of a tree bole measured at 4.5 feet above ground level. It is usually expressed in square feet of cross-sectional area per acre.

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.

Basic rock. An igneous rock composed dominantly of dark minerals. The minerals of this rock are comparatively low in silica and rich in bases, such as the amphiboles, the pyroxenes, biotite, or olivine.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

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.

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.

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 to intercept storm water and divert it off the roadbed. Dips are spaced about 200 feet apart and placed to divert water away from stream crossings or steep grades.

Cable yarding. A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve a drum, 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 or reeled in while one end is lifted or the entire log is completely suspended.

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.

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.

Channel flow. Storm waters from roads, roofs, parking lots, and other impervious surfaces flowing into intermittent drainageways during and after heavy rainfall.

Channery soil. A soil that is, by volume, more than 15 percent thin, flat fragments of metasandstone, phyllite, or slate as much as 6 inches along the longest axis. A single piece is called a fragment.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

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.

Climax vegetation. 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.

Clod. See Aggregate, soil.

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-loamy. According to family level criteria in the soil taxonomic system, soil containing less than 18 percent, by weight, clay and 15 or more percent fine sand or coarser material.

Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

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, 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 in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

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. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are:

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.
Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.
Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.
Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.
Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.
Soft.—When dry, breaks into powder or individual grains under very slight pressure.
Cemented.—Hard; little affected by moistening.

Contour farming. A system of planting crops on the natural contour of the land that provides slope breaks to slow runoff. For example, planting crops in rows perpendicular to the slope instead of up and down the slope.

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.

Cove. Gently sloping to very steep, concave colluvial areas commonly located at the head of or along drainageways in mountainous areas. Coves are long and narrow along drainageways extending up into the mountains and become wide and bowl shaped as streams flow out of the mountains down 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.

Crop residue management. Use of that portion of the plant or crop left in the field after harvest for protection or improvement of the soil.

Crust. A thin, hard layer of soil material that forms on the surface of cultivated areas as the result of fine soil material settling out of ponding.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

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. The process of drawing or plotting features on a map with lines and symbols.

Denitrification. The biochemical reduction of nitrate or nitrite to gaseous nitrogen either as molecular nitrogen or as an oxide of nitrogen.

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 to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:
Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.
Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.
Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.
Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but

periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

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.

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.

Engineering index test data. Laboratory test and mechanical analysis of selected soils in the county.

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 fire, that exposes the surface.

Erosion classes. Classes based on estimates of past erosion. The classes are as follows:

Class 1.—Soils that have lost some of the original A horizon but on the 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 of the area, 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 that 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 of class 2 erosion, 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 that have lost an average of 75 percent or more of the original A horizon or the uppermost 8 inches (if the original A horizon was less than 8 inches thick). In most cultivated areas of class 3 erosion, material that was below the original A horizon is exposed at the surface. The plow layer consists entirely or largely of this material.

Class 4.—Soils that have lost all of the original A horizon or the uppermost 8 inches (if the original A horizon was less than 8 inches thick) plus some or all of the deeper horizons throughout most of the area. The original soil can be identified only in spots. Some areas may be smooth, but most have an intricate pattern of gullies.

Erosion hazard. Terms 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 tons per acre (values determined by the Universal Soil Loss Equation assuming bare soil conditions and using rainfall and climate factors for North Carolina):

0 tons per acre	none
Less than 1 ton per acre	slight

1 to 5 tons per acre..... moderate
5 to 10 tons per acre..... severe
More than 10 tons per acre..... very severe

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 are in the soil. The soil is not a source of gravel or sand for construction purposes.

Fast intake (in tables). The movement of water into the soil is rapid.

Fault. A surface of rock rupture along which there has been differential movement.

Felsic rock. A general term for light-colored igneous rock and some metamorphic crystalline rock.

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.

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 made by excavating soil material from the road cut. It commonly is on the downhill side of the road.

Fine-loamy. According to family level criteria in the soil taxonomic system, soil containing 18 to 35 percent, by weight, clay and 15 or more percent fine sand or coarser material.

Fine textured soil. Sandy clay, silty clay, or clay.

Firebreak. 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.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist, 6 to 15 inches (15 to 37.5 centimeters) long.

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.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant that is not a grass or a sedge.

Forest type. A classification of forest land based on the species forming the majority of live-tree stocking.

Fragile (in tables). The soil is easily damaged by use or disturbance.

Frost action (in tables). Freezing and thawing of soil moisture can damage roads, buildings and other structures, and plant roots.

Gap. A concave, lower-lying 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.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Gneiss. A coarse grained metamorphic rock in which bands rich in granular minerals alternate with bands in which schistose minerals predominate. It is commonly formed by the metamorphism of granite.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

Granite. A coarse grained igneous rock dominated by light-colored minerals, consisting of about 50 percent orthoclase and 25 percent quartz with the balance being plagioclase feldspars and ferromagnesian silicates. Granites and granodiorites comprise 95 percent of all intrusive rocks.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3

inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.6 centimeters) in diameter.

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 (geology). 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.

Head slope. A concave, horseshoe-shaped slope on a mountain landscape at the beginning of an intermittent drainageway.

High-grade metamorphic rocks. Highly metamorphosed rocks, such as gneiss and schist.

High mountains. The part of the landscape that is above an elevation of about 4,800 feet. It is dominated by frigid soil temperatures.

High stream terrace. A terrace, commonly 20 feet or higher in elevation than the adjacent flood plain, that is no longer subject to flooding.

High sulfur-bearing rock. Any rock rich in pyrite (iron disulfide).

High-value crop. Crops, such as tobacco, cabbage, and tomatoes, that require a high level of management, are labor intensive, and have a potential high profit per acre.

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 at the surface of a mineral soil.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

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 O, A, or E horizon. The B horizon is, in part, a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as accumulation of clay, sesquioxides, humus, or a combination of these; prismatic or blocky structure; redder or browner colors than those in the A horizon; or a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Arabic numeral 2 precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated rock (unweathered bedrock) beneath the soil. The bedrock commonly underlies a C horizon but can be directly below an A or a B horizon.

Hornblende. A rock-forming ferromagnesian silicate mineral of the amphibole group.

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-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Hydroseeding. A method of applying seed, fertilizer, and mulch to steep areas by mixing those

ingredients with water and spraying the slurry under pressure from a truck.

Igneous rock. Rock formed by solidification of molten rock, generally crystalline in nature.

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.

Infiltration. The downward entry of water into the immediate surface of soil or other material. This contrasts 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.

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 3,500 to 4,800 feet in elevation. It is dominated by mesic soil temperatures.

Intermediate rock. Igneous or metamorphic crystalline rock that is intermediate in composition between mafic and felsic rock.

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.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Landscape. A section or portion of the land. Examples are high, intermediate, and low mountains; low, rolling hills; and flood plains. Parts of a landscape include side slopes, back slopes, toe slopes, foot slopes, ridgetops, ridge noses, and spur or finger ridges.

Landscape position. A particular location on the landscape. Examples are the summit of a ridge, shoulder of a ridge, ridge nose, side slope, back slope, toe slope, foot slope, cove, and drainageway.

Land shaping. The practice of scraping higher convex areas into lower concave areas to make the field nearly level and reduce ponding.

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.

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.

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 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 is not strong enough to support loads.

Mafic rock. A dark rock composed predominantly of

magnesium silicates. It contains little quartz, feldspar, or muscovite mica.

Mean annual increment. The average yearly volume of a stand of trees from the year of origin to the age under consideration.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

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 slate.

Metasediments. Parent material derived from metasedimentary rocks.

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 small area, such as 1 acre.

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. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of 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 with its 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 normally on slopes of more than 30 percent, which are too steep to manage with modern machinery.

Natural soil. Soil material or saprolite that is in place and is not fill.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nose slope. The downward-sloping convex end of a main ridge or spur ridge.

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, 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 matter. Plant and animal residue in the soil in various stages of decomposition.

Out-sloping roads. Placing a slight tilt to a roadbed so that water flows off the downhill side.

Overstory. The portion of the trees in a forest stand forming the upper crown cover.

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.

Pegmatite. A small pluton of exceptionally coarse texture, commonly formed at the margin of a batholith characterized by graphic structure. Nearly 90 percent of all pegmatites are simple pegmatites of quartz, orthoclase, and unimportant percentages of micas.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water to move through the profile. Permeability is

measured as the number of inches per hour that water moves through the saturated soil. Terms describing permeability are:

Very slow	less than 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

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Subsurface tunnels or pipelike cavities are formed 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.

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 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 natural plant community. The total plant community that is best adapted to the combination of environmental factors and is in dynamic equilibrium with the environment.

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.

Reaction, soil. A measure of the 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	below 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
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

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. See Ridgetop.

Ridge nose. The landscape position that is the terminal point of a ridge or a spur ridge.

Ridgetop. The landscape position that is the crest of a hill or mountain.

Rill. A steep-sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rippable. Rippable bedrock or 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.

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 of rate of runoff 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 or 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 starts to form 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.

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.

Saprolite (soil science). Unconsolidated, residual material underlying the soil and grading to hard bedrock below.

Saprolite instability. A property of highly micaceous saprolite that makes it very susceptible to piping, erosion, slumping, and failure to support loads.

Schist. A metamorphic rock dominated by fibrous or platy minerals. It has schistose cleavage and is a product of regional metamorphism.

Seasonal high water table. The highest level of a saturated zone in the apparent water table over a continuous period of more than 2 weeks in most years, but not a permanent water table.

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 adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shoulder. The landscape position, parallel to the summit, that is just below the ridgetop and just above the side slope.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Side slope. The landscape position that is just below the shoulder and just above the toe slope, occupying most of the mountainside or hillside.

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.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

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 rubber-tired tractor. Generally, felled trees are skidded or

pulled with one end lifted to reduce friction and soil disturbance.

Skid trails. The paths left from skidding logs and the bulldozer or tractor used to pull them.

Slate. A fine grained metamorphic rock with well developed slaty cleavage. Formed by the low-grade regional metamorphism of shale.

Slippage (in tables). The soil mass is susceptible to movement downslope when loaded, excavated, or wet.

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 area slope classes are as follows:

Nearly level	0 to 3 percent
Gently sloping	1 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.

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.

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 downslope, primarily under the influence of gravity, facilitated by water saturation and by alternating 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. They are generally designed to reflect significant differences in use and management.

Soil puddling. This condition occurs in certain soils when they are driven over while they are wet. Exertion of mechanical force destroys the soil structure by compressing and shearing and results in the rearrangement of the soil particles to a massive or nonstructural state.

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. Load-supporting capacity of a soil under 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 in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Specialty crop. 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 landscape position that is a sharply convex portion of a mountain side slope extending from the main ridge to some point of lower elevation.

Stand density. The degree to which an area is covered with living trees. It is usually expressed in units of basal area per acre, number of trees per acre, or the percentage of ground covered by the tree canopy as viewed from above.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, thickness of the line can be one fragment or more. It generally overlies material that weathered in place, and it 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.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to soil blowing and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from soil blowing and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in 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.
Moderately 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 high hazard of erosion, a high water table, low fertility, or a hazard of flooding. Major soil reclamation, special design, or intensive management practices are needed.
Very poorly suited, not suited, or *unsuited.*—The intended use is very difficult or costly to initiate and maintain, and thus it generally should not be undertaken.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace. An embankment, or ridge, constructed on the contour or at a slight angle to the contour across sloping soils. The terrace intercepts surface runoff, so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine." The textural classes are as follows:
Sands (coarse sand, sand, fine sand, and very fine sand).—Soil material in which the content of sand is 85 percent or more and the percentage of silt plus 1.5 times the percentage of clay does not exceed 15.
Loamy sands (loamy coarse sand, loamy sand, loamy fine sand, and loamy very fine sand).—Soil material in which, at the upper limit, the content of sand is 85 to 90 percent and the percentage of silt plus 1.5 times the percentage of clay is not less than 15 and, at the lower limit, the content of sand is 70 to 85 percent and the percentage of silt plus twice the percentage of clay does not exceed 30.
Sandy loams (coarse sandy loam, sandy loam, fine sandy loam, and very fine sandy loam).—Soil material in which the content of clay is 20 percent or less, the percentage of silt plus twice the percentage of clay exceeds 30, and the content of sand is 52 percent or more or soil material in which the content of clay is less than 7 percent, the content of silt is less than 50 percent, and the content of sand is 43 to 52 percent.
Loam.—Soil material that contains 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand.
Silt loam.—Soil material that contains 50 or more percent silt and 12 to 27 percent clay or 50 to 80 percent silt and less than 12 percent clay.
Silt.—Soil material that contains 80 or more percent silt and less than 12 percent clay.
Sandy clay loam.—Soil material that contains 20 to 35 percent clay, less than 28 percent silt, and 45 or more percent sand.

Clay loam.—Soil material that contains 27 to 40 percent clay and 20 to 45 percent sand.
Silty clay loam.—Soil material that contains 27 to 40 percent clay and less than 20 percent sand.
Sandy clay.—Soil material that contains 35 or more percent clay and 45 or more percent sand.
Silty clay.—Soil material that contains 40 or more percent clay and 40 or more percent silt.
Clay.—Soil material that contains 40 or more percent clay, less than 45 percent sand, and less than 40 percent silt.

Thin layer (in tables). An 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.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

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 high in organic matter content and is used to topdress roadbanks, lawns, and land affected by mining.

Toxicity (in tables). An excessive amount of toxic substances in the soil, such as sodium or sulfur, severely hinders the establishment of vegetation or severely restricts plant growth.

Trace elements. Chemical elements, such as 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.

Universal Soil Loss Equation. An equation used to design water-erosion control systems. The equation is A=RKLSPC wherein A is the average annual soil loss in tons per acre per year, R is the rainfall factor, K is the soil erodibility factor, L is the length of slope, S is the steepness of slope, P is the conservation practice factor, and C is the cropping and management factor.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

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 (seasonal high). The highest level of a saturated zone in the soil (the apparent water table) over a continuous period of more than 2 weeks in most years, but not a permanent water table.

Weathering. All physical and chemical changes produced by atmospheric agents in rocks or other deposits at or near the earth's surface. 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.

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 because of exposure to high winter winds and frequent ice storms.

Windthrow. The uprooting and tipping over of trees by the wind.

Yarding paths. The paths left from cable-yarded logs as they are pulled uphill or downhill to a nearby central area.

Yield (forest land). The volume of wood fiber from harvested trees taken from 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 1951-81 at Cullowhee, North Carolina)

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average daily	Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days*	Average	Less than--	More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January	49.5	25.3	37.4	70	-2	26	4.41	2.51	6.09	9	3.2
February	53.0	27.0	40.0	72	2	28	4.39	2.34	6.19	8	3.3
March	60.8	33.3	47.1	81	11	75	5.65	3.63	7.47	10	2.6
April	70.7	41.1	55.9	86	22	190	3.93	2.06	5.56	7	.0
May	77.0	49.0	63.0	88	29	403	4.46	2.37	6.28	9	.0
June	82.3	56.6	69.5	92	38	585	4.23	2.54	5.74	9	.0
July	84.7	61.0	72.9	93	48	710	4.44	2.13	6.42	9	.0
August	84.1	60.4	72.3	92	47	691	4.04	1.78	5.96	8	.0
September	79.4	54.9	67.2	90	36	516	3.48	1.90	4.87	6	.0
October	70.8	42.0	56.4	84	20	211	3.10	1.45	4.55	6	.0
November	60.4	32.3	46.4	77	11	39	3.37	2.13	4.48	7	.5
December	51.7	27.1	39.4	71	4	18	4.54	2.36	6.45	8	2.0
Yearly:											
Average	68.7	42.5	55.6	---	---	---	---	---	---	---	---
Extreme	---	---	---	94	-4	---	---	---	---	---	---
Total	---	---	---	---	---	3,492	50.04	43.83	56.04	96	11.6

* 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 1951-81 at Cullowhee, 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. 16	May 6	May 19
2 years in 10 later than--	Apr. 10	May 1	May 14
5 years in 10 later than--	Mar. 31	Apr. 20	May 3
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 17	Oct. 6	Sept. 29
2 years in 10 earlier than--	Oct. 22	Oct. 11	Oct. 3
5 years in 10 earlier than--	Nov. 2	Oct. 20	Oct. 10

TABLE 3.--GROWING SEASON

(Recorded in the period 1951-81 at Cullowhee, 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	191	164	141
8 years in 10	199	170	147
5 years in 10	215	182	159
2 years in 10	230	195	171
1 year in 10	238	201	177

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
BaA	Biltmore sand, 0 to 3 percent slopes, frequently flooded	347	0.1
BkB2	Braddock clay loam, 2 to 8 percent slopes, eroded	350	0.1
BkC2	Braddock clay loam, 8 to 15 percent slopes, eroded	1,004	0.3
BkD2	Braddock clay loam, 15 to 30 percent slopes, eroded	1,293	0.4
BrC	Braddock-Urban land complex, 2 to 15 percent slopes	841	0.3
BuD	Burton-Craggey-Rock outcrop complex, windswept, 8 to 30 percent slopes, stony	740	0.2
BuF	Burton-Craggey-Rock outcrop complex, windswept, 30 to 95 percent slopes, stony	768	0.2
CaC	Cashiers gravelly fine sandy loam, 8 to 15 percent slopes	360	0.1
CaD	Cashiers gravelly fine sandy loam, 15 to 30 percent slopes	709	0.2
CaE	Cashiers gravelly fine sandy loam, 30 to 50 percent slopes	4,333	1.4
CaF	Cashiers gravelly fine sandy loam, 50 to 95 percent slopes	2,863	0.9
CdC	Chandler gravelly fine sandy loam, 8 to 15 percent slopes	1,211	0.4
CdD	Chandler gravelly fine sandy loam, 15 to 30 percent slopes	4,428	1.4
CdE	Chandler gravelly fine sandy loam, 30 to 50 percent slopes	8,862	2.8
CdF	Chandler gravelly fine sandy loam, 50 to 95 percent slopes	3,502	1.1
CeC	Chandler gravelly fine sandy loam, 8 to 15 percent slopes, windswept	318	0.1
CeD	Chandler gravelly fine sandy loam, 15 to 30 percent slopes, windswept	1,266	0.4
CeE	Chandler gravelly fine sandy loam, 30 to 50 percent slopes, windswept	615	0.2
CeF	Chandler gravelly fine sandy loam, 50 to 95 percent slopes, windswept	367	0.1
ChE	Cheoah channery loam, 30 to 50 percent slopes	381	0.1
ChF	Cheoah channery loam, 50 to 95 percent slopes	2,757	0.9
CnC	Chestnut-Edneyville complex, windswept, 8 to 15 percent slopes, stony	483	0.2
CnD	Chestnut-Edneyville complex, windswept, 15 to 30 percent slopes, stony	1,308	0.4
CnE	Chestnut-Edneyville complex, windswept, 30 to 50 percent slopes, stony	856	0.3
CpD	Cleveland-Chestnut-Rock outcrop complex, windswept, 15 to 30 percent slopes	2,065	0.7
CpE	Cleveland-Chestnut-Rock outcrop complex, windswept, 30 to 50 percent slopes	3,143	1.0
CpF	Cleveland-Chestnut-Rock outcrop complex, windswept, 50 to 95 percent slopes	10,094	3.2
CrD	Cowee-Evard-Urban land complex, 15 to 30 percent slopes	838	0.3
CsD	Cullasaja very cobbly fine sandy loam, 15 to 30 percent slopes, extremely bouldery	336	0.1
CsE	Cullasaja very cobbly fine sandy loam, 30 to 50 percent slopes, extremely bouldery	879	0.3
CuC	Cullasaja-Tuckasegee complex, 8 to 15 percent slopes, stony	2,701	0.9
CuD	Cullasaja-Tuckasegee complex, 15 to 30 percent slopes, stony	19,443	6.1
CuE	Cullasaja-Tuckasegee complex, 30 to 50 percent slopes, stony	11,339	3.6
CuF	Cullasaja-Tuckasegee complex, 50 to 90 percent slopes, stony	684	0.2
CwA	Cullowhee fine sandy loam, 0 to 2 percent slopes, occasionally flooded	945	0.3
DfA	Dellwood gravelly fine sandy loam, 0 to 3 percent slopes, occasionally flooded	1,017	0.3
DrB	Dillard loam, 1 to 5 percent slopes, rarely flooded	483	0.2
DsB	Dillsboro loam, 2 to 8 percent slopes	345	0.1
DsC	Dillsboro loam, 8 to 15 percent slopes	230	0.1
EdC	Edneyville-Chestnut complex, 8 to 15 percent slopes, stony	2,270	0.7
EdD	Edneyville-Chestnut complex, 15 to 30 percent slopes, stony	12,309	3.9
EdE	Edneyville-Chestnut complex, 30 to 50 percent slopes, stony	19,205	6.1
EdF	Edneyville-Chestnut complex, 50 to 95 percent slopes, stony	15,970	5.0
EgB2	Ellijay silty clay loam, 2 to 8 percent slopes, eroded	148	*
EgC2	Ellijay silty clay loam, 8 to 15 percent slopes, eroded	192	0.1
EgD2	Ellijay silty clay loam, 15 to 30 percent slopes, eroded	279	0.1
EvC	Evard-Cowee complex, 8 to 15 percent slopes	1,226	0.4
EvD	Evard-Cowee complex, 15 to 30 percent slopes	12,079	3.8
EvE	Evard-Cowee complex, 30 to 50 percent slopes	26,513	8.4
EvF	Evard-Cowee complex, 50 to 95 percent slopes	15,007	4.7
FaC	Fannin fine sandy loam, 8 to 15 percent slopes	326	0.1
FaD	Fannin fine sandy loam, 15 to 30 percent slopes	3,297	1.0
FaE	Fannin fine sandy loam, 30 to 50 percent slopes	5,205	1.6
FaF	Fannin fine sandy loam, 50 to 95 percent slopes	1,242	0.4
HpA	Hemphill clay loam, 0 to 3 percent slopes, rarely flooded	324	0.1
JbD	Junaluska-Brasstown complex, 15 to 30 percent slopes	985	0.3
JbE	Junaluska-Brasstown complex, 30 to 50 percent slopes	1,275	0.4
JtD	Junaluska-Tsali complex, 15 to 30 percent slopes	791	0.2
JtE	Junaluska-Tsali complex, 30 to 50 percent slopes	604	0.2
JtF	Junaluska-Tsali complex, 50 to 95 percent slopes	1,909	0.6
NkA	Nikwasi fine sandy loam, 0 to 2 percent slopes, frequently flooded	1,709	0.5
OcD	Oconaluftee channery loam, 15 to 30 percent slopes	240	0.1

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
OcE	Oconaluftee channery loam, 30 to 50 percent slopes	350	0.1
OcF	Oconaluftee channery loam, 50 to 95 percent slopes	1,108	0.3
OwD	Oconaluftee channery loam, windswept, 15 to 30 percent slopes	353	0.1
OwE	Oconaluftee channery loam, windswept, 30 to 50 percent slopes	388	0.1
OwF	Oconaluftee channery loam, windswept, 50 to 95 percent slopes	783	0.2
Pt	Pits, quarries	126	*
PwD	Plott fine sandy loam, 15 to 30 percent slopes, stony	1,999	0.6
PwE	Plott fine sandy loam, 30 to 50 percent slopes, stony	8,576	2.7
PwF	Plott fine sandy loam, 50 to 95 percent slopes, stony	18,766	5.9
RdA	Reddies fine sandy loam, 0 to 2 percent slopes, occasionally flooded	318	0.1
RkF	Rock outcrop-Cleveland complex, windswept, 30 to 95 percent slopes	5,802	1.8
RoA	Rosman fine sandy loam, 0 to 2 percent slopes, occasionally flooded	370	0.1
SaB	Saunook gravelly loam, 2 to 8 percent slopes	675	0.2
SaC	Saunook gravelly loam, 8 to 15 percent slopes	3,793	1.2
SaD	Saunook gravelly loam, 15 to 30 percent slopes	2,998	1.0
SbD	Saunook gravelly loam, 15 to 30 percent slopes, stony	2,810	0.9
SoD	Soco-Stecoah complex, 15 to 30 percent slopes	1,052	0.3
SoE	Soco-Stecoah complex, 30 to 50 percent slopes	1,461	0.5
SoF	Soco-Stecoah complex, 50 to 95 percent slopes	5,542	1.8
SrD	Spivey-Santeetlah complex, 15 to 30 percent slopes, stony	1,302	0.4
SrE	Spivey-Santeetlah complex, 30 to 50 percent slopes, stony	1,248	0.4
SvB	Statler loam, 1 to 5 percent slopes, rarely flooded	443	0.1
SyA	Sylva-Whiteside complex, 0 to 2 percent slopes	772	0.2
TaC	Tanasee-Balsam complex, 8 to 15 percent slopes, stony	135	*
TaD	Tanasee-Balsam complex, 15 to 30 percent slopes, stony	627	0.2
TaE	Tanasee-Balsam complex, 30 to 50 percent slopes, stony	1,397	0.4
TrE	Trimont gravelly loam, 30 to 50 percent slopes, stony	2,832	0.9
TrF	Trimont gravelly loam, 50 to 95 percent slopes, stony	6,310	2.0
TwC	Tuckasegee-Whiteside complex, 8 to 15 percent slopes	5,515	1.7
Ud	Udorthents, loamy	2,923	0.9
UfB	Udorthents-Urban land complex, 0 to 5 percent slopes, rarely flooded	1,839	0.6
WaD	Wayah sandy loam, 15 to 30 percent slopes, stony	637	0.2
WaE	Wayah sandy loam, 30 to 50 percent slopes, stony	492	0.2
WaF	Wayah sandy loam, 50 to 95 percent slopes, stony	2,822	0.9
WeC	Wayah sandy loam, windswept, 8 to 15 percent slopes, stony	205	0.1
WeD	Wayah sandy loam, windswept, 15 to 30 percent slopes, stony	994	0.3
WeE	Wayah sandy loam, windswept, 30 to 50 percent slopes, stony	1,253	0.4
WeF	Wayah sandy loam, windswept, 50 to 95 percent slopes, stony	4,873	1.5
WtB	Whiteside-Tuckasegee complex, 2 to 8 percent slopes	2,435	0.8
	Water	2,944	0.9
	Total	316,877	100.0

* Less than 0.1 percent.

TABLE 5.--PRIME FARMLAND

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name)

Map symbol	Soil name
BkB2	Braddock clay loam, 2 to 8 percent slopes, eroded
CwA	Cullowhee fine sandy loam, 0 to 2 percent slopes, occasionally flooded (where drained)
DrB	Dillard loam, 1 to 5 percent slopes, rarely flooded
DsB	Dillsboro loam, 2 to 8 percent slopes
RdA	Reddies fine sandy loam, 0 to 2 percent slopes, occasionally flooded
RoA	Rosman fine sandy loam, 0 to 2 percent slopes, occasionally flooded
SaB	Saunook gravelly loam, 2 to 8 percent slopes
SvB	Statler loam, 1 to 5 percent slopes, rarely flooded
SyA	Sylva-Whiteside complex, 0 to 2 percent slopes (where drained)
WtB	Whiteside-Tuckasegee complex, 2 to 8 percent slopes

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE

(Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Soil name and map symbol	Land capability	Tobacco	Tomatoes	Corn	Corn silage	Cabbage	Pasture
		Lbs	Tons	Bu	Tons	Crates	AUM*
BaA---------- Biltmore	IVw	2,400	26	90	17	400	5.5
BkB2---------- Braddock	IIIe	2,400	18	100	19	---	7.5
BkC2---------- Braddock	IVe	---	---	85	16	---	7.5
BkD2---------- Braddock	VIe	---	---	---	---	---	7.0
BrC**:							
Braddock-------	IVe	---	---	---	---	---	---
Urban land-----	VIIIs	---	---	---	---	---	---
BuD**:							
Burton---------	VIs	---	---	---	---	---	---
Craggey--------	VIIs	---	---	---	---	---	---
Rock outcrop---	VIIIs	---	---	---	---	---	---
BuF**:							
Burton---------	VIIs	---	---	---	---	---	---
Craggey--------	VIIs	---	---	---	---	---	---
Rock outcrop---	VIIIs	---	---	---	---	---	---
CaC---------- Cashiers	IVe	---	---	---	---	475	7.0
CaD---------- Cashiers	VIe	---	---	---	---	---	6.0
CaE---------- Cashiers	VIIe	---	---	---	---	---	5.0
CaF---------- Cashiers	VIIe	---	---	---	---	---	---
CdC---------- Chandler	IVe	---	---	---	---	---	6.5
CdD---------- Chandler	VIe	---	---	---	---	---	5.5
CdE---------- Chandler	VIIe	---	---	---	---	---	4.5
CdF---------- Chandler	VIIe	---	---	---	---	---	---
CeC---------- Chandler	IVe	---	---	---	---	---	6.0

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Tobacco	Tomatoes	Corn	Corn silage	Cabbage	Pasture
		Lbs	Tons	Bu	Tons	Crates	AUM*
CeD---------- Chandler	VIe	---	---	---	---	---	5.0
CeE---------- Chandler	VIIe	---	---	---	---	---	4.0
CeF---------- Chandler	VIIe	---	---	---	---	---	---
ChE---------- Cheoah	VIIe	---	---	---	---	---	6.0
ChF---------- Cheoah	VIIe	---	---	---	---	---	---
CnC:							
Chestnut-------	IVe	---	---	70	---	450	6.0
Edneyville-----	IVe	---	---	---	---	---	5.5
CnD:							
Chestnut-------	VIe	---	---	---	---	---	6.0
Edneyville-----	VIe	---	---	---	---	---	5.5
CnE:							
Chestnut-------	VIIe	---	---	---	---	---	5.5
Edneyville-----	VIIe	---	---	---	---	---	5.0
CpD**:							
Cleveland------	VIIe	---	---	---	---	---	---
Chestnut-------	VIe	---	---	---	---	---	---
Rock outcrop---	VIIIs	---	---	---	---	---	---
CpE**, CpF**:							
Cleveland------	VIIe	---	---	---	---	---	---
Chestnut-------	VIIe	---	---	---	---	---	---
Rock outcrop---	VIIIs	---	---	---	---	---	---
CrD**:							
Cowee----------	VIe	---	---	---	---	---	---
Evard----------	VIe	---	---	---	---	---	---
Urban land-----	VIIIs	---	---	---	---	---	---
CsD, CsE-------- Cullasaja	VIIs	---	---	---	---	---	---
CuC:							
Cullasaja------	VIIs	---	---	---	---	400	7.5
Tuckasegee-----	IIIe	---	---	---	---	475	8.0
CuD:							
Cullasaja------	VIIs	---	---	---	---	---	7.5

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Tobacco	Tomatoes	Corn	Corn silage	Cabbage	Pasture
		Lbs	Tons	Bu	Tons	Crates	AUM*
CuD:							
Tuckasegee	VIe	---	---	---	---	---	8.0
CuE:							
Cullasaja	VIIs	---	---	---	---	---	6.0
Tuckasegee	VIIe	---	---	---	---	---	6.0
CuF:							
Cullasaja	VIIs	---	---	---	---	---	---
Tuckasegee	VIIe	---	---	---	---	---	---
CwA---Cullowhee	IIIw	2,400	26	110	24	---	7.0
DfA---Dellwood	IIIs	2,000	22	100	19	---	7.0
DrB---Dillard	IIw	2,800	28	135	25	500	8.5
DsB---Dillsboro	IIe	2,800	26	120	22	500	8.5
DsC---Dillsboro	IIIe	2,600	22	110	20	450	8.0
EdC:							
Edneyville	IVe	---	---	---	---	450	7.0
Chestnut	IVe	---	---	---	---	400	6.5
EdD:							
Edneyville	VIe	---	---	---	---	---	6.5
Chestnut	VIe	---	---	---	---	---	6.0
EdE:							
Edneyville	VIIe	---	---	---	---	---	6.0
Chestnut	VIIe	---	---	---	---	---	5.5
EdF:							
Edneyville	VIIe	---	---	---	---	---	---
Chestnut	VIIe	---	---	---	---	---	---
EgB2---Ellijay	IIIe	---	---	---	---	---	7.5
EgC2---Ellijay	IVe	---	---	---	---	---	6.5
EgD2---Ellijay	VIe	---	---	---	---	---	5.5
EvC:							
Evard	IVe	2,200	---	85	16	---	6.5
Cowee	IVe	2,000	---	80	14	---	6.0

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Tobacco	Tomatoes	Corn	Corn silage	Cabbage	Pasture
		Lbs	Tons	Bu	Tons	Crates	AUM*
EvD:							
Evard	VIe	---	---	---	---	---	6.0
Cowee	VIe	---	---	---	---	---	5.5
EvE:							
Evard	VIIe	---	---	---	---	---	5.5
Cowee	VIIe	---	---	---	---	---	5.0
EvF:							
Evard	VIIe	---	---	---	---	---	---
Cowee	VIIe	---	---	---	---	---	---
FaC---Fannin	VIe	2,200	---	---	---	---	7.0
FaD, FaE---Fannin	VIIe	---	---	---	---	---	6.0
FaF---Fannin	VIIe	---	---	---	---	---	---
HpA***---Hemphill	IVw	2,200	26	120	22	---	7.0
JbD:							
Junaluska	VIe	---	---	---	---	---	5.0
Brasstown	VIe	---	---	---	---	---	5.5
JbE:							
Junaluska	VIIe	---	---	---	---	---	4.5
Brasstown	VIIe	---	---	---	---	---	5.0
JtD:							
Junaluska	VIe	---	---	---	---	---	5.0
Tsali	VIe	---	---	---	---	---	2.5
JtE, JtF:							
Junaluska	VIIe	---	---	---	---	---	---
Tsali	VIIe	---	---	---	---	---	---
NkA---Nikwasi	VIw	---	---	---	---	---	5.0
OcD---Oconaluftee	VIe	---	---	---	---	---	5.0
OcE---Oconaluftee	VIIe	---	---	---	---	---	4.0
OcF---Oconaluftee	VIIe	---	---	---	---	---	---
OwD---Oconaluftee	VIe	---	---	---	---	---	5.0

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Tobacco	Tomatoes	Corn	Corn silage	Cabbage	Pasture
		Lbs	Tons	Bu	Tons	Crates	AUM*
OwE---------- Oconaluftee	VIIe	---	---	---	---	---	4.0
OwF---------- Oconaluftee	VIIe	---	---	---	---	---	---
Pt**---------- Pits, quarries	VIIIs	---	---	---	---	---	---
PwD---------- Plott	VIe	---	---	---	---	---	7.0
PwE---------- Plott	VIIe	---	---	---	---	---	6.0
PwF---------- Plott	VIIe	---	---	---	---	---	---
RdA---------- Reddies	IIw	2,800	28	120	22	450	8.0
RkF:							
Rock outcrop---	VIIIs	---	---	---	---	---	---
Cleveland------	VIIe	---	---	---	---	---	---
RoA---------- Rosman	IIw	3,000	30	135	25	450	8.5
SaB---------- Saunook	IIe	3,000	30	135	25	450	8.5
SaC---------- Saunook	IVe	2,800	28	120	22	450	8.0
SaD, SbD-------- Saunook	VIe	---	---	---	---	---	8.0
SoD:							
Soco----------	VIe	---	---	---	---	---	4.5
Stecoah--------	VIe	---	---	---	---	---	5.0
SoE:							
Soco----------	VIIe	---	---	---	---	---	4.0
Stecoah--------	VIIe	---	---	---	---	---	4.5
SoF:							
Soco----------	VIIe	---	---	---	---	---	---
Stecoah--------	VIIe	---	---	---	---	---	---
SrD, SrE:							
Spivey---------	VIIs	---	---	---	---	---	5.5
Santeetlah-----	VIIs	---	---	---	---	---	6.0
SvB---------- Statler	IIe	3,000	30	135	25	400	8.5

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Tobacco	Tomatoes	Corn	Corn silage	Cabbage	Pasture
		Lbs	Tons	Bu	Tons	Crates	AUM*
SyA:							
Sylva	IIIw	---	---	---	---	---	8.0
Whiteside	IIw	---	---	---	---	---	8.0
TaC:							
Tanasee	IVe	---	---	---	---	---	---
Balsam	VIIs	---	---	---	---	---	---
TaD:							
Tanasee	VIe	---	---	---	---	---	---
Balsam	VIIs	---	---	---	---	---	---
TaE:							
Tanasee	VIIe	---	---	---	---	---	---
Balsam	VIIs	---	---	---	---	---	---
TrE---Trimont	VIIe	---	---	---	---	---	6.0
TrF---Trimont	VIIe	---	---	---	---	---	---
TwC:							
Tuckasegee	IIIe	---	---	---	---	500	8.0
Whiteside	IVe	---	---	---	---	500	8.0
Ud---Udorthents, loamy	VIIs	---	---	---	---	---	---
UfB**:							
Udorthents	VIIs	---	---	---	---	---	---
Urban land	VIIIs	---	---	---	---	---	---
WaD---Wayah	VIe	---	---	---	---	---	6.0
WaE---Wayah	VIIe	---	---	---	---	---	5.5
WaF---Wayah	VIIe	---	---	---	---	---	---
WeC---Wayah	IVe	---	---	---	---	---	6.0
WeD---Wayah	VIe	---	---	---	---	---	6.0
WeE---Wayah	VIIe	---	---	---	---	---	5.5
WeF---Wayah	VIIe	---	---	---	---	---	---

See footnotes at end of table.

TABLE 6.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Land capability	Tobacco	Tomatoes	Corn	Corn silage	Cabbage	Pasture
		Lbs	Tons	Bu	Tons	Crates	AUM*
WtB:							
Whiteside------	IIe	---	---	---	---	500	8.0
Tuckasegee-----	IIe	---	---	---	---	500	8.0

* Animal unit month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

*** Yields are for artificially drained areas.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available)

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
BaA---------- Biltmore	8S	Slight	Moderate	Moderate	Slight	Yellow-poplar-------	106	117	Yellow-poplar, eastern white pine, black walnut.
						Eastern white pine--	95	176	
						White oak----------	---	---	
						American sycamore---	---	---	
						White ash----------	---	---	
						Black cherry--------	---	---	
						Black walnut--------	---	---	
						Pitch pine----------	---	---	
						Shortleaf pine------	---	---	
						Virginia pine-------	---	---	
BkB2, BkC2------ Braddock	4C	Slight	Moderate	Moderate	Slight	Northern red oak----	80	62	Eastern white pine.
						Yellow-poplar-------	90	90	
						Eastern white pine--	95	176	
						Black oak----------	---	---	
						White oak----------	---	---	
						Hickory------------	---	---	
						Scarlet oak---------	---	---	
						Pitch pine----------	---	---	
						Chestnut oak--------	---	---	
						Virginia pine-------	---	---	
BkD2---------- Braddock	4R	Moderate	Moderate	Moderate	Slight	Northern red oak----	70	52	Eastern white pine.
						Yellow-poplar-------	80	71	
						Eastern white pine--	85	155	
						Black oak----------	---	---	
						White oak----------	---	---	
						Hickory------------	---	---	
						Scarlet oak---------	---	---	
						Pitch pine----------	---	---	
						Chestnut oak--------	---	---	
						Virginia pine-------	---	---	
BuD**:									
Burton---------	2R	Moderate	Moderate	Severe	Moderate	Northern red oak----	40	26	
						Red spruce----------	---	---	
						Fraser fir----------	---	---	
						Sweet birch---------	---	---	
						Yellow birch--------	---	---	
Craggey--------	2D	Moderate	Moderate	Severe	Severe	Northern red oak----	40	26	
						Red spruce----------	---	---	
						Fraser fir----------	---	---	
						Sweet birch---------	---	---	
						Yellow birch--------	---	---	
Rock outcrop.									
BuF**:									
Burton---------	2R	Severe	Severe	Severe	Moderate	Northern red oak----	40	26	
						Red spruce----------	---	---	
						Fraser fir----------	---	---	
						Sweet birch---------	---	---	
						Yellow birch--------	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
BuF**:									
Craggey	2R	Severe	Severe	Severe	Severe	Northern red oak	40	26	
						Red spruce	---	---	
						Fraser fir	---	---	
						Sweet birch	---	---	
						Yellow birch	---	---	
Rock outcrop.									
CaC	7A	Slight	Slight	Slight	Slight	Yellow-poplar	93	95	Yellow-poplar,
Cashiers						Eastern white pine	91	168	eastern white
						Northern red oak	84	66	pine, Fraser
						Eastern hemlock	---	---	fir***.
						Yellow buckeye	---	---	
						American beech	---	---	
						White ash	---	---	
						Red maple	---	---	
						Black cherry	---	---	
						Sweet birch	---	---	
CaD	7R	Moderate	Moderate	Slight	Slight	Yellow-poplar	93	95	Yellow-poplar,
Cashiers						Eastern white pine	91	168	eastern white
						Northern red oak	84	66	pine, Fraser
						Eastern hemlock	---	---	fir***.
						Yellow buckeye	---	---	
						American beech	---	---	
						White ash	---	---	
						Red maple	---	---	
						Black cherry	---	---	
						Sweet birch	---	---	
CaE, CaF	7R	Severe	Severe	Slight	Slight	Yellow-poplar	93	95	Yellow-poplar,
Cashiers						Eastern white pine	91	168	eastern white
						Northern red oak	84	66	pine, Fraser
						Eastern hemlock	---	---	fir***.
						Yellow buckeye	---	---	
						American beech	---	---	
						White ash	---	---	
						Red maple	---	---	
						Black cherry	---	---	
						Sweet birch	---	---	
CdC	4A	Slight	Slight	Slight	Slight	Chestnut oak	76	58	Eastern white
Chandler						Eastern white pine	88	162	pine.
						Shortleaf pine	72	114	
						Virginia pine	74	114	
						Pitch pine	---	---	
						Northern red oak	---	---	
						Scarlet oak	---	---	
						Hickory	---	---	
						Yellow-poplar	---	---	
						White oak	76	58	
						Black oak	---	---	
						Black locust	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
CdD---------- Chandler	4R	Moderate	Moderate	Slight	Slight	Chestnut oak--------	76	58	Eastern white pine.
						Eastern white pine--	88	162	
						Shortleaf pine------	72	114	
						Virginia pine-------	74	114	
						Pitch pine----------	---	---	
						Northern red oak----	---	---	
						Scarlet oak---------	---	---	
						Hickory------------	---	---	
						Yellow-poplar-------	---	---	
						White oak----------	76	58	
						Black oak----------	---	---	
						Black locust--------	---	---	
CdE, CdF-------- Chandler	4R	Severe	Severe	Slight	Slight	Chestnut oak--------	76	58	Eastern white pine.
						Eastern white pine--	88	162	
						Shortleaf pine------	72	114	
						Virginia pine-------	74	114	
						Pitch pine----------	---	---	
						Northern red oak----	---	---	
						Scarlet oak---------	---	---	
						Hickory------------	---	---	
						Yellow-poplar-------	---	---	
						White oak----------	76	58	
						Black oak----------	---	---	
						Black locust--------	---	---	
CeC---------- Chandler	2A	Slight	Slight	Slight	Slight	Chestnut oak--------	45	30	
						Scarlet oak---------	---	---	
						Eastern white pine--	---	---	
						Pitch pine----------	---	---	
						Virginia pine-------	---	---	
						Hickory------------	---	---	
						Black oak----------	---	---	
						White oak----------	---	---	
						Yellow-poplar-------	---	---	
						Black locust--------	---	---	
CeD---------- Chandler	2R	Moderate	Moderate	Slight	Slight	Chestnut oak--------	45	30	
						Scarlet oak---------	---	---	
						Eastern white pine--	---	---	
						Pitch pine----------	---	---	
						Virginia pine-------	---	---	
						Hickory------------	---	---	
						Black oak----------	---	---	
						White oak----------	---	---	
						Yellow-poplar-------	---	---	
						Black locust--------	---	---	
CeE, CeF-------- Chandler	2R	Severe	Severe	Slight	Slight	Chestnut oak--------	45	30	
						Scarlet oak---------	---	---	
						Eastern white pine--	---	---	
						Pitch pine----------	---	---	
						Virginia pine-------	---	---	
						Hickory------------	---	---	
						Black oak----------	---	---	
						White oak----------	---	---	
						Yellow-poplar-------	---	---	
						Black locust--------	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
ChE, ChF--------- Cheoah	4R	Severe	Severe	Slight	Slight	Northern red oak---- Yellow-poplar------- American beech------ Black cherry-------- Eastern hemlock----- Black oak----------- Yellow birch-------- Sugar maple--------- Sweet birch--------- Scarlet oak--------- White oak----------- Hickory-------------	83 103 80 74 --- --- --- --- --- --- --- ---	65 112 --- --- --- --- --- --- --- --- --- ---	Fraser fir***, northern red oak, yellow-poplar.
CnC**: Chestnut------- Edneyville----- CnD**: Chestnut------- Edneyville-----	2D 2A 2R 2R	Slight Slight Moderate Moderate	Slight Slight Moderate Moderate	Severe Severe Severe Severe	Moderate Slight Moderate Slight	Northern red oak---- Scarlet oak--------- Eastern white pine-- Pitch pine---------- Virginia pine------- Hickory------------- Chestnut oak-------- Black oak----------- White oak----------- Black locust-------- Northern red oak---- Scarlet oak--------- Eastern white pine-- Pitch pine---------- Virginia pine------- Hickory------------- Chestnut oak-------- Black oak----------- White oak----------- Black locust-------- Northern red oak---- Scarlet oak--------- Eastern white pine-- Pitch pine---------- Virginia pine------- Hickory------------- Chestnut oak-------- Black oak----------- White oak----------- Black locust--------	45 --- --- --- --- --- --- --- --- --- 45 --- --- --- --- --- --- --- --- --- 45 --- --- --- --- --- --- --- --- ---	30 --- --- --- --- --- --- --- --- --- 30 --- --- --- --- --- --- --- --- --- 30 --- --- --- --- --- --- --- --- ---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Volume*	Trees to plant
CnE**:									
Chestnut	2R	Severe	Severe	Severe	Moderate	Northern red oak	45	30	
						Scarlet oak	---	---	
						Eastern white pine	---	---	
						Pitch pine	---	---	
						Virginia pine	---	---	
						Hickory	---	---	
						Chestnut oak	---	---	
						Black oak	---	---	
						White oak	---	---	
						Black locust	---	---	
Edneyville	2R	Severe	Severe	Severe	Slight	Northern red oak	45	30	
						Scarlet oak	---	---	
						Eastern white pine	---	---	
						Pitch pine	---	---	
						Virginia pine	---	---	
						Hickory	---	---	
						Chestnut oak	---	---	
						Black oak	---	---	
						White oak	---	---	
						Black locust	---	---	
CpD**:									
Cleveland	2D	Moderate	Moderate	Severe	Severe	Chestnut oak	40	26	
						Scarlet oak	---	---	
						Northern red oak	---	---	
						Eastern white pine	---	---	
						Pitch pine	---	---	
						Virginia pine	---	---	
						Hickory	---	---	
Chestnut	2R	Moderate	Moderate	Severe	Moderate	Northern red oak	45	30	
						Scarlet oak	---	---	
						Eastern white pine	---	---	
						Pitch pine	---	---	
						Virginia pine	---	---	
						Hickory	---	---	
						Chestnut oak	---	---	
Rock outcrop.									
CpE**, CpF**:									
Cleveland	2R	Severe	Severe	Severe	Severe	Chestnut oak	40	26	
						Scarlet oak	---	---	
						Northern red oak	---	---	
						Eastern white pine	---	---	
						Pitch pine	---	---	
						Virginia pine	---	---	
						Hickory	---	---	
						Sweet birch	---	---	
						Eastern hemlock	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
CpE**, CpF**:									
Chestnut	2R	Severe	Severe	Severe	Moderate	Northern red oak	45	30	
						Scarlet oak	---	---	
						Eastern white pine	---	---	
						Pitch pine	---	---	
						Virginia pine	---	---	
						Hickory	---	---	
						Sweet birch	---	---	
						Eastern hemlock	---	---	
Rock outcrop.									
CsD	8R	Moderate	Moderate	Moderate	Slight	Yellow-poplar	109	122	Fraser fir***,
Cullasaja						Black cherry	---	---	yellow-poplar,
						Yellow birch	---	---	eastern white
						Northern red oak	---	---	pine, northern
						Eastern white pine	---	---	red oak, black
						Sweet birch	---	---	cherry.
						Sugar maple	---	---	
						American beech	---	---	
						Yellow buckeye	---	---	
						Eastern hemlock	---	---	
CsE	8R	Severe	Severe	Moderate	Slight	Yellow-poplar	109	122	Fraser fir***,
Cullasaja						Black cherry	---	---	yellow-poplar,
						Yellow birch	---	---	eastern white
						Northern red oak	---	---	pine, northern
						Eastern white pine	---	---	red oak, black
						Sweet birch	---	---	cherry.
						Sugar maple	---	---	
						American beech	---	---	
						Yellow buckeye	---	---	
						Eastern hemlock	---	---	
CuC**:									
Cullasaja	8X	Slight	Slight	Moderate	Slight	Yellow-poplar	109	122	Fraser fir***,
						Black cherry	---	---	yellow-poplar,
						Northern red oak	---	---	eastern white
						Yellow birch	---	---	pine, northern
						Eastern white pine	---	---	red oak, black
						Sweet birch	---	---	cherry.
						Sugar maple	---	---	
						American beech	---	---	
						Yellow buckeye	---	---	
						Eastern hemlock	---	---	
Tuckasegee	8A	Slight	Slight	Slight	Slight	Yellow-poplar	109	122	Yellow-poplar,
						Eastern white pine	98	182	eastern white
						Northern red oak	---	---	pine, northern
						Black cherry	---	---	red oak, black
						Eastern hemlock	---	---	cherry, Fraser
						White oak	---	---	fir***.
						Yellow birch	---	---	
						American beech	---	---	
						Black locust	---	---	
						Yellow buckeye	---	---	
						Sugar maple	---	---	
						Sweet birch	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
CuD**:									
Cullasaja	8R	Moderate	Moderate	Moderate	Slight	Yellow-poplar	109	122	Fraser fir***, yellow-poplar, eastern white pine, northern red oak, black cherry.
						Black cherry	---	---	
						Northern red oak	---	---	
						Yellow birch	---	---	
						Eastern white pine	---	---	
						American beech	---	---	
						Sugar maple	---	---	
						Eastern hemlock	---	---	
						Sweet birch	---	---	
						Yellow buckeye	---	---	
Tuckasegee	8R	Moderate	Moderate	Slight	Slight	Yellow-poplar	109	122	Yellow-poplar, eastern white pine, northern red oak, black cherry, Fraser fir***.
						Eastern white pine	98	182	
						Northern red oak	---	---	
						Black cherry	---	---	
						Eastern hemlock	---	---	
						White oak	---	---	
						Yellow birch	---	---	
						American beech	---	---	
						Black locust	---	---	
						Yellow buckeye	---	---	
						Sugar maple	---	---	
						Sweet birch	---	---	
CuE**, CuF**:									
Cullasaja	8R	Severe	Severe	Moderate	Slight	Yellow-poplar	109	122	Fraser fir***, yellow-poplar, eastern white pine, northern red oak, black cherry.
						Black cherry	---	---	
						Northern red oak	---	---	
						Yellow birch	---	---	
						Eastern white pine	---	---	
						American beech	---	---	
						Sugar maple	---	---	
						Eastern hemlock	---	---	
						Sweet birch	---	---	
						Yellow buckeye	---	---	
Tuckasegee	8R	Severe	Severe	Slight	Slight	Yellow-poplar	109	122	Yellow-poplar, eastern white pine, northern red oak, black cherry, Fraser fir***.
						Eastern white pine	98	182	
						Northern red oak	---	---	
						Black cherry	---	---	
						Eastern hemlock	---	---	
						White oak	---	---	
						Yellow birch	---	---	
						American beech	---	---	
						Black locust	---	---	
						Yellow buckeye	---	---	
						Sugar maple	---	---	
						Sweet birch	---	---	
CwA	8W	Slight	Moderate	Slight	Slight	Yellow-poplar	103	112	Eastern white pine.
Cullowhee						Shortleaf pine	82	132	
						Eastern white pine	100	139	
						American sycamore	---	---	
						Red maple	---	---	
						Yellow birch	---	---	
						Eastern hemlock	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
DfA---------- Dellwood	8F	Slight	Slight	Moderate	Slight	Yellow-poplar-------	100	107	Yellow-poplar, eastern white pine.
						Eastern white pine--	91	168	
						Red maple----------	---	---	
						River birch---------	---	---	
						American sycamore---	---	---	
						Eastern hemlock-----	---	---	
						Sweet birch---------	---	---	
						Black cherry--------	---	---	
DrB---------- Dillard	7A	Slight	Slight	Slight	Slight	Yellow-poplar-------	95	98	Eastern white pine, black walnut, yellow-poplar.
						Eastern white pine--	90	166	
						Shortleaf pine------	75	120	
						Virginia pine-------	80	112	
DsB, DsC-------- Dillsboro	7A	Slight	Slight	Slight	Slight	Yellow-poplar-------	95	98	Yellow-poplar, eastern white pine, shortleaf pine, Fraser fir***, black walnut.
						Eastern white pine--	---	---	
						Shortleaf pine------	---	---	
						Virginia pine-------	---	---	
						White oak-----------	---	---	
						Scarlet oak---------	---	---	
						Northern red oak----	---	---	
EdC**:									
Edneyville-----	4A	Slight	Slight	Slight	Slight	Northern red oak----	80	62	Eastern white pine, yellow-poplar, shortleaf pine, Fraser fir***.
						Shortleaf pine------	64	97	
						Virginia pine-------	66	102	
						Eastern white pine--	90	166	
						Yellow-poplar-------	98	104	
						Chestnut oak--------	---	---	
						Scarlet oak---------	---	---	
						Black oak-----------	---	---	
						White oak-----------	---	---	
						Pitch pine----------	---	---	
						Hickory-------------	---	---	
						Black locust--------	---	---	
Chestnut-------	4D	Slight	Slight	Slight	Moderate	Northern red oak----	76	58	Eastern white pine, yellow-poplar, Fraser fir***, shortleaf pine.
						Eastern white pine--	78	139	
						Yellow-poplar-------	97	102	
						Scarlet oak---------	68	50	
						White oak-----------	70	52	
						Black oak-----------	71	53	
						Chestnut oak--------	69	51	
						Shortleaf pine------	---	---	
						Pitch pine----------	---	---	
						Virginia pine-------	---	---	
						Hickory-------------	---	---	
						Black locust--------	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Volume*	Trees to plant
EdD**:									
Edneyville	4R	Moderate	Moderate	Slight	Slight	Northern red oak	80	62	Eastern white pine, yellow-poplar, shortleaf pine, Fraser fir***.
						Shortleaf pine	64	97	
						Virginia pine	66	102	
						Eastern white pine	90	166	
						Yellow-poplar	98	104	
						Chestnut oak	---	---	
						Scarlet oak	---	---	
						Black oak	---	---	
						White oak	---	---	
						Pitch pine	---	---	
						Hickory	---	---	
						Black locust	---	---	
Chestnut	4R	Moderate	Moderate	Slight	Moderate	Northern red oak	76	58	Eastern white pine, yellow-poplar, Fraser fir***.
						Eastern white pine	78	139	
						Yellow-poplar	97	102	
						Scarlet oak	68	50	
						White oak	70	52	
						Black oak	71	53	
						Chestnut oak	69	51	
						Shortleaf pine	---	---	
						Pitch pine	---	---	
						Virginia pine	---	---	
						Hickory	---	---	
						Black locust	---	---	
EdE**, EdF**:									
Edneyville	4R	Severe	Severe	Slight	Slight	Northern red oak	80	62	Eastern white pine, yellow-poplar, shortleaf pine, Fraser fir***.
						Shortleaf pine	64	97	
						Virginia pine	66	102	
						Eastern white pine	90	166	
						Yellow-poplar	98	104	
						Chestnut oak	---	---	
						Scarlet oak	---	---	
						Black oak	---	---	
						White oak	---	---	
						Pitch pine	---	---	
						Hickory	---	---	
						Black locust	---	---	
Chestnut	4R	Severe	Severe	Slight	Moderate	Northern red oak	76	58	Eastern white pine, yellow-poplar, Fraser fir***.
						Eastern white pine	78	139	
						Yellow-poplar	97	102	
						Scarlet oak	68	50	
						White oak	70	52	
						Black oak	71	53	
						Chestnut oak	69	51	
						Shortleaf pine	---	---	
						Pitch pine	---	---	
						Virginia pine	---	---	
						Hickory	---	---	
						Black locust	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
EgB2, EgC2---- Ellijay	6T	Slight	Slight	Moderate	Slight	Virginia pine	58	86	Eastern white pine.
						Pitch pine	---	---	
						White oak	---	---	
						Post oak	---	---	
						Black oak	---	---	
						Scarlet oak	---	---	
						Chestnut oak	---	---	
						Hickory	---	---	
EgD2---- Ellijay	6R	Moderate	Moderate	Moderate	Slight	Virginia pine	58	86	Eastern white pine.
						Pitch pine	---	---	
						White oak	---	---	
						Post oak	---	---	
						Black oak	---	---	
						Scarlet oak	---	---	
						Chestnut oak	---	---	
						Hickory	---	---	
EvC**:									
Evard----	4A	Slight	Slight	Slight	Slight	Chestnut oak	77	59	Eastern white pine, yellow-poplar.
						Shortleaf pine	73	116	
						Pitch pine	---	---	
						Virginia pine	69	107	
						Eastern white pine	93	172	
						Yellow-poplar	95	98	
						White oak	---	---	
						Northern red oak	---	---	
						Hickory	---	---	
						Scarlet oak	---	---	
						Black oak	---	---	
						Black locust	---	---	
Cowee----	3D	Slight	Slight	Slight	Moderate	Chestnut oak	55	38	Eastern white pine.
						Virginia pine	63	96	
						Scarlet oak	54	38	
						Shortleaf pine	78	126	
						Eastern white pine	78	139	
						Yellow-poplar	80	71	
						Pitch pine	---	---	
						Northern red oak	---	---	
						Black oak	---	---	
						White oak	---	---	
						Hickory	---	---	
						Black locust	---	---	
EvD**:									
Evard----	4R	Moderate	Moderate	Slight	Slight	Chestnut oak	77	59	Eastern white pine, yellow-poplar.
						Shortleaf pine	73	116	
						Pitch pine	---	---	
						Virginia pine	69	107	
						Eastern white pine	93	172	
						Yellow-poplar	95	98	
						White oak	---	---	
						Northern red oak	---	---	
						Hickory	---	---	
						Scarlet oak	---	---	
						Black oak	---	---	
						Black locust	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
EvD**:									
Cowee	3R	Moderate	Moderate	Slight	Moderate	Chestnut oak	55	38	Eastern white pine.
						Virginia pine	63	96	
						Scarlet oak	54	38	
						Shortleaf pine	78	126	
						Eastern white pine	78	139	
						Yellow-poplar	80	71	
						Pitch pine	---	---	
						Northern red oak	---	---	
						Black oak	---	---	
						White oak	---	---	
						Hickory	---	---	
						Black locust	---	---	
EvE**, EvF**:									
Evard	4R	Severe	Severe	Slight	Slight	Chestnut oak	77	59	Eastern white pine, yellow-poplar.
						Shortleaf pine	73	116	
						Pitch pine	---	---	
						Virginia pine	69	107	
						Eastern white pine	93	172	
						Yellow-poplar	95	98	
						White oak	---	---	
						Northern red oak	---	---	
						Hickory	---	---	
						Scarlet oak	---	---	
						Black oak	---	---	
						Black locust	---	---	
Cowee	3R	Severe	Severe	Slight	Moderate	Chestnut oak	55	38	Eastern white pine.
						Virginia pine	63	96	
						Scarlet oak	54	38	
						Shortleaf pine	78	126	
						Eastern white pine	78	139	
						Yellow-poplar	80	71	
						Pitch pine	---	---	
						Northern red oak	---	---	
						Black oak	---	---	
						White oak	---	---	
						Hickory	---	---	
						Black locust	---	---	
FaC	7A	Slight	Slight	Slight	Slight	Yellow-poplar	96	100	Eastern white pine, yellow-poplar, Fraser fir***.
Fannin						Northern red oak	---	---	
						Eastern white pine	94	174	
						Pitch pine	---	---	
						Shortleaf pine	---	---	
						Virginia pine	---	---	
						Scarlet oak	---	---	
						Chestnut oak	---	---	
						Black oak	---	---	
						White oak	---	---	
						Hickory	---	---	
						Black locust	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
FaD---------- Fannin	7R	Moderate	Moderate	Slight	Slight	Yellow-poplar-------	96	100	Eastern white pine, yellow-poplar, Fraser fir***.
						Northern red oak----	---	---	
						Eastern white pine--	94	174	
						Pitch pine----------	---	---	
						Shortleaf pine------	---	---	
						Virginia pine-------	---	---	
						Scarlet oak---------	---	---	
						Chestnut oak--------	---	---	
						Black oak-----------	---	---	
						White oak-----------	---	---	
						Hickory-------------	---	---	
						Black locust--------	---	---	
FaE, FaF-------- Fannin	7R	Severe	Severe	Slight	Slight	Yellow-poplar-------	96	100	Eastern white pine, yellow-poplar, Fraser fir***.
						Northern red oak----	---	---	
						Eastern white pine--	94	174	
						Pitch pine----------	---	---	
						Shortleaf pine------	---	---	
						Virginia pine-------	---	---	
						Scarlet oak---------	---	---	
						Chestnut oak--------	---	---	
						Black oak-----------	---	---	
						White oak-----------	---	---	
						Hickory-------------	---	---	
						Black locust--------	---	---	
HpA---------- Hemphill	6W	Slight	Severe	Severe	Slight	Yellow-poplar-------	88	86	Eastern white pine.
						Red maple-----------	---	---	
						Yellow birch--------	---	---	
						Eastern hemlock-----	---	---	
						Eastern white pine--	84	153	
						Alder---------------	---	---	
JbD**:									
Junaluska------	3R	Moderate	Moderate	Moderate	Moderate	Scarlet oak---------	65	48	Eastern white pine.
						Chestnut oak--------	65	48	
						White oak-----------	61	44	
						Shortleaf pine------	68	106	
						Virginia pine-------	74	114	
						Eastern white pine--	86	157	
						Pitch pine----------	---	---	
						Northern red oak----	---	---	
						Black oak-----------	---	---	
						Hickory-------------	---	---	
						Black locust--------	---	---	
Brasstown------	4R	Moderate	Moderate	Slight	Slight	Scarlet oak---------	80	62	Eastern white pine.
						White oak-----------	80	62	
						Eastern white pine--	91	168	
						Shortleaf pine------	71	112	
						Virginia pine-------	74	114	
						Pitch pine----------	---	---	
						Northern red oak----	---	---	
						Black oak-----------	---	---	
						Chestnut oak--------	---	---	
						Hickory-------------	---	---	
						Black locust--------	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
JbE**:									
Junaluska	3R	Severe	Severe	Moderate	Moderate	Scarlet oak	65	48	Eastern white pine.
						Chestnut oak	65	48	
						White oak	61	44	
						Shortleaf pine	68	106	
						Virginia pine	74	114	
						Eastern white pine	86	157	
						Pitch pine	---	---	
						Northern red oak	---	---	
						Black oak	---	---	
						Hickory	---	---	
						Black locust	---	---	
Brasstown	4R	Severe	Severe	Slight	Slight	Scarlet oak	80	62	Eastern white pine.
						White oak	80	62	
						Eastern white pine	91	168	
						Shortleaf pine	71	112	
						Virginia pine	74	114	
						Pitch pine	---	---	
						Northern red oak	---	---	
						Black oak	---	---	
						Chestnut oak	---	---	
						Hickory	---	---	
						Black locust	---	---	
JtD**:									
Junaluska	3R	Moderate	Moderate	Moderate	Moderate	Scarlet oak	65	48	Eastern white pine.
						Chestnut oak	65	48	
						White oak	61	44	
						Shortleaf pine	68	106	
						Virginia pine	74	114	
						Eastern white pine	86	157	
						Pitch pine	---	---	
						Northern red oak	---	---	
						Black oak	---	---	
						Hickory	---	---	
Tsali	2D	Moderate	Severe	Moderate	Severe	Scarlet oak	52	36	Virginia pine.
						Shortleaf pine	60	88	
						Virginia pine	66	100	
						White oak	48	32	
						Chestnut oak	---	---	
						Black oak	---	---	
						Hickory	---	---	
						Pitch pine	---	---	
JtE**, JtF**:									
Junaluska	3R	Severe	Severe	Moderate	Moderate	Scarlet oak	65	48	Eastern white pine.
						Chestnut oak	65	48	
						White oak	61	44	
						Shortleaf pine	68	106	
						Virginia pine	74	114	
						Eastern white pine	86	157	
						Pitch pine	---	---	
						Northern red oak	---	---	
						Black oak	---	---	
						Hickory	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
JtE**, JtF**:									
Tsali	2R	Severe	Severe	Moderate	Severe	Scarlet oak	52	36	Virginia pine.
						Shortleaf pine	60	88	
						Virginia pine	66	100	
						White oak	48	32	
						Chestnut oak	---	---	
						Black oak	---	---	
						Hickory	---	---	
						Pitch pine	---	---	
NkA	6W	Slight	Severe	Severe	Slight	Yellow-poplar	88	86	Eastern white
Nikwasi						Eastern white pine	86	157	pine.
						American sycamore	---	---	
						Red maple	---	---	
						Yellow birch	---	---	
						Eastern hemlock	---	---	
						Sweet birch	---	---	
						Alder	---	---	
OcD	10R	Moderate	Moderate	Slight	Slight	Red spruce	64	150	Red spruce,
Oconaluftee						Fraser fir	---	---	Fraser fir***,
						Northern red oak	---	---	northern red
						Black oak	---	---	oak.
						American beech	---	---	
						Yellow birch	---	---	
						Black cherry	---	---	
						Sugar maple	---	---	
						Eastern hemlock	---	---	
						Yellow buckeye	---	---	
						Sweet birch	---	---	
OcE, OcF	10R	Severe	Severe	Slight	Slight	Red spruce	64	150	Red spruce,
Oconaluftee						Fraser fir	---	---	Fraser fir***,
						Northern red oak	---	---	northern red
						Black oak	---	---	oak.
						American beech	---	---	
						Yellow birch	---	---	
						Black cherry	---	---	
						Sugar maple	---	---	
						Eastern hemlock	---	---	
						Yellow buckeye	---	---	
						Sweet birch	---	---	
OwD	2R	Moderate	Moderate	Severe	Slight	Northern red oak	40	26	
Oconaluftee						Red spruce	---	---	
						Fraser fir	---	---	
						Black cherry	---	---	
						Sugar maple	---	---	
						Yellow birch	---	---	
						Sweet birch	---	---	
OwE, OwF	2R	Severe	Severe	Severe	Slight	Northern red oak	40	26	
Oconaluftee						Red spruce	---	---	
						Fraser fir	---	---	
						Black cherry	---	---	
						Sugar maple	---	---	
						Yellow birch	---	---	
						Sweet birch	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
PwD---------- Plott	5R	Moderate	Moderate	Slight	Slight	Northern red oak----	85	67	Fraser fir***, northern red oak, yellow-poplar, black cherry.
						Yellow-poplar-------	113	128	
						Black cherry--------	87	---	
						American beech------	---	---	
						Sugar maple---------	---	---	
						Eastern hemlock-----	---	---	
						Black oak-----------	---	---	
						Yellow birch--------	---	---	
						Sweet birch---------	---	---	
						Scarlet oak---------	---	---	
						White oak-----------	---	---	
						Hickory-------------	---	---	
PwE, PwF-------- Plott	5R	Severe	Severe	Slight	Slight	Northern red oak----	85	67	Fraser fir***, northern red oak, yellow-poplar, black cherry.
						Yellow-poplar-------	113	128	
						Black cherry--------	87	---	
						American beech------	---	---	
						Sugar maple---------	---	---	
						Eastern hemlock-----	---	---	
						Black oak-----------	---	---	
						Yellow birch--------	---	---	
						Sweet birch---------	---	---	
						Scarlet oak---------	---	---	
						White oak-----------	---	---	
						Hickory-------------	---	---	
RdA---------- Reddies	8A	Slight	Slight	Slight	Moderate	Yellow-poplar-------	105	115	Yellow-poplar, eastern white pine.
						American sycamore---	---	---	
						Red maple-----------	---	---	
						Eastern white pine--	---	---	
						River birch---------	---	---	
RkF**: Rock outcrop.									
Cleveland------	2R	Severe	Severe	Severe	Severe	Chestnut oak--------	40	26	
						Scarlet oak---------	---	---	
						Northern red oak----	---	---	
						Eastern white pine--	---	---	
						Sweet birch---------	---	---	
						Eastern hemlock-----	---	---	
						Pitch pine----------	---	---	
						Virginia pine-------	---	---	
						Hickory-------------	---	---	
RoA---------- Rosman	8A	Slight	Slight	Slight	Slight	Yellow-poplar-------	105	115	Yellow-poplar, eastern white pine, black walnut.
						Eastern white pine--	100	186	
						Northern red oak----	---	---	
						American sycamore---	---	---	
						Black walnut--------	---	---	
						Red maple-----------	---	---	
						River birch---------	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Volume*	Trees to plant
SaB, SaC--Saunook	8A	Slight	Slight	Slight	Slight	Yellow-poplar	107	119	Yellow-poplar, eastern white pine, northern red oak, Fraser fir***, black walnut.
						Eastern white pine	104	194	
						Northern red oak	---	---	
						White oak	---	---	
						Scarlet oak	---	---	
						Eastern hemlock	---	---	
						Red maple	---	---	
						Black cherry	---	---	
						American beech	---	---	
						Sweet birch	---	---	
						Yellow buckeye	---	---	
SaD, SbD--Saunook	8R	Moderate	Moderate	Slight	Slight	Yellow-poplar	107	119	Yellow-poplar, eastern white pine, northern red oak, Fraser fir***, black walnut.
						Eastern white pine	104	194	
						Northern red oak	---	---	
						White oak	---	---	
						Scarlet oak	---	---	
						Eastern hemlock	---	---	
						Red maple	---	---	
						Black cherry	---	---	
						American beech	---	---	
						Sweet birch	---	---	
						Yellow buckeye	---	---	
SoD**:									
Soco	11R	Moderate	Moderate	Slight	Moderate	Eastern white pine	85	155	Eastern white pine, Norway spruce, Fraser fir***.
						Shortleaf pine	61	90	
						Pitch pine	---	---	
						Virginia pine	---	---	
						Chestnut oak	68	50	
						Scarlet oak	76	58	
						Northern red oak	---	---	
						White oak	---	---	
						Black oak	---	---	
						Yellow-poplar	---	---	
						Hickory	---	---	
						Black locust	---	---	
Stecoah	12R	Moderate	Moderate	Slight	Slight	Eastern white pine	91	168	Eastern white pine, Fraser fir***.
						Shortleaf pine	69	108	
						Scarlet oak	---	---	
						White oak	82	64	
						Yellow-poplar	---	---	
						Chestnut oak	---	---	
						Virginia pine	---	---	
						Hickory	---	---	
						Black oak	---	---	
						Northern red oak	---	---	
						Pitch pine	---	---	
						Black locust	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
SoE**, SoF**:									
Soco	11R	Severe	Severe	Slight	Moderate	Eastern white pine	85	155	Eastern white pine, Norway spruce, Fraser fir***.
						Shortleaf pine	61	90	
						Pitch pine	---	---	
						Virginia pine	---	---	
						Chestnut oak	68	50	
						Scarlet oak	76	58	
						Northern red oak	---	---	
						White oak	---	---	
						Black oak	---	---	
						Yellow-poplar	---	---	
						Hickory	---	---	
						Black locust	---	---	
Stecoah	12R	Severe	Severe	Slight	Slight	Eastern white pine	91	168	Eastern white pine, Fraser fir***.
						Shortleaf pine	69	108	
						Scarlet oak	---	---	
						White oak	82	64	
						Yellow-poplar	---	---	
						Chestnut oak	---	---	
						Virginia pine	---	---	
						Hickory	---	---	
						Black oak	---	---	
						Northern red oak	---	---	
						Pitch pine	---	---	
						Black locust	---	---	
SrD**:									
Spivey	8R	Moderate	Moderate	Moderate	Slight	Yellow-poplar	100	107	Yellow-poplar, eastern white pine, Fraser fir***.
						Northern red oak	80	62	
						Eastern white pine	90	166	
						Eastern hemlock	---	---	
						Sugar maple	---	---	
						White oak	---	---	
						Yellow birch	---	---	
						Black cherry	---	---	
						American beech	---	---	
						Sweet birch	---	---	
						Yellow buckeye	---	---	
						Black oak	---	---	
Santeetlah	8R	Moderate	Moderate	Slight	Slight	Yellow-poplar	108	121	Northern red oak, black cherry, sugar maple, Fraser fir***.
						Black cherry	---	---	
						Sugar maple	---	---	
						Eastern hemlock	---	---	
						Yellow buckeye	---	---	
						Yellow birch	---	---	
						Northern red oak	---	---	
						Black oak	---	---	
						White oak	---	---	
						American beech	---	---	
						Sweet birch	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Volume*	Trees to plant
SrE**:									
Spivey	8R	Severe	Severe	Moderate	Slight	Yellow-poplar	100	107	Yellow-poplar, eastern white pine, Fraser fir***.
						Northern red oak	80	62	
						Eastern white pine	90	166	
						Eastern hemlock	---	---	
						Sugar maple	---	---	
						White oak	---	---	
						Yellow birch	---	---	
						Black cherry	---	---	
						American beech	---	---	
						Sweet birch	---	---	
						Yellow buckeye	---	---	
						Black oak	---	---	
Santeetlah	8R	Severe	Severe	Slight	Slight	Yellow-poplar	108	121	Northern red oak, black cherry, sugar maple, Fraser fir***.
						Black cherry	---	---	
						Sugar maple	---	---	
						Eastern hemlock	---	---	
						Yellow buckeye	---	---	
						Yellow birch	---	---	
						Northern red oak	---	---	
						Black oak	---	---	
						White oak	---	---	
						American beech	---	---	
						Sweet birch	---	---	
SvB	8A	Slight	Slight	Slight	Slight	Yellow-poplar	100	107	Yellow-poplar, black walnut, eastern white pine.
Statler						White oak	80	62	
						Eastern white pine	90	166	
						Red maple	---	---	
						Northern red oak	---	---	
						Hickory	---	---	
SyA**:									
Sylva	8W	Slight	Severe	Severe	Slight	Yellow-poplar	100	107	Yellow-poplar, eastern white pine.
						Eastern white pine	---	---	
						White oak	---	---	
						Red maple	---	---	
						Eastern hemlock	---	---	
						Basswood	---	---	
						Alder	---	---	
Whiteside	7A	Slight	Slight	Slight	Slight	Yellow-poplar	95	98	Eastern white pine, yellow-poplar, black cherry.
						Eastern white pine	90	166	
						Black cherry	90	---	
						Eastern hemlock	---	---	
						Sugar maple	---	---	
						Red maple	---	---	
						White oak	---	---	
						Yellow birch	---	---	
						Sweet birch	---	---	
						Black locust	---	---	
						Alder	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
TaC**:									
Tanasee	10A	Slight	Slight	Slight	Slight	Red spruce	64	150	Red spruce, Fraser fir***.
						Fraser fir	---	---	
						Northern red oak	---	---	
						Black cherry	---	---	
						Black oak	---	---	
						American beech	---	---	
						Yellow birch	---	---	
						Sugar maple	---	---	
						Eastern hemlock	---	---	
						Yellow buckeye	---	---	
						Sweet birch	---	---	
Balsam	10A	Slight	Slight	Slight	Slight	Red spruce	64	150	Red spruce, Fraser fir***.
						Fraser fir	---	---	
						Northern red oak	---	---	
						Yellow birch	---	---	
						Sugar maple	---	---	
						Sweet birch	---	---	
						Eastern hemlock	---	---	
TaD**:									
Tanasee	10R	Moderate	Moderate	Slight	Slight	Red spruce	64	150	Red spruce, Fraser fir***.
						Fraser fir	---	---	
						Northern red oak	---	---	
						Black cherry	---	---	
						Black oak	---	---	
						American beech	---	---	
						Yellow birch	---	---	
						Sugar maple	---	---	
						Eastern hemlock	---	---	
						Yellow buckeye	---	---	
						Sweet birch	---	---	
Balsam	10R	Moderate	Moderate	Slight	Slight	Red spruce	64	150	Red spruce, Fraser fir***.
						Fraser fir	---	---	
						Northern red oak	---	---	
						Yellow birch	---	---	
						Sugar maple	---	---	
						Sweet birch	---	---	
						Eastern hemlock	---	---	
TaE**:									
Tanasee	10R	Severe	Severe	Slight	Slight	Red spruce	64	150	Red spruce, Fraser fir***.
						Fraser fir	---	---	
						Northern red oak	---	---	
						Black cherry	---	---	
						Black oak	---	---	
						American beech	---	---	
						Yellow birch	---	---	
						Sugar maple	---	---	
						Eastern hemlock	---	---	
						Yellow buckeye	---	---	
						Sweet birch	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
TaE**:									
Balsam	10R	Moderate	Moderate	Slight	Slight	Red spruce	64	150	Red spruce, Fraser fir***.
						Fraser fir	---	---	
						Northern red oak	---	---	
						Yellow birch	---	---	
						Sugar maple	---	---	
						Sweet birch	---	---	
						Eastern hemlock	---	---	
TrE, TrF	8R	Severe	Severe	Slight	Slight	Yellow-poplar	102	110	Yellow-poplar,
Trimont						Northern red oak	94	76	northern red
						Black oak	---	---	oak, black
						White oak	---	---	oak, white
						American beech	---	---	oak.
						Black cherry	---	---	
						Sweet birch	---	---	
TwC**:									
Tuckasegee	8A	Slight	Slight	Slight	Slight	Yellow-poplar	109	122	Yellow-poplar,
						Eastern white pine	98	182	eastern white
						Northern red oak	---	---	pine, northern
						Black cherry	---	---	red oak, black
						Eastern hemlock	---	---	cherry, Fraser
						White oak	---	---	fir***.
						Yellow birch	---	---	
						American beech	---	---	
						Black locust	---	---	
						Yellow buckeye	---	---	
						Sugar maple	---	---	
						Sweet birch	---	---	
Whiteside	7A	Slight	Slight	Slight	Slight	Yellow-poplar	95	98	Eastern white
						Eastern white pine	90	166	pine, yellow-
						Black cherry	90	---	poplar, black
						Eastern hemlock	---	---	cherry.
						Sugar maple	---	---	
						Red maple	---	---	
						White oak	---	---	
						Yellow birch	---	---	
						Sweet birch	---	---	
						Black locust	---	---	
WaD	4R	Moderate	Moderate	Slight	Slight	Northern red oak	72	54	Northern red
Wayah						Black cherry	72	---	oak, red
						Red spruce	57	129	spruce, Fraser
						Fraser fir	60	---	fir***.
						American beech	---	---	
						Yellow birch	---	---	
						Sugar maple	---	---	
						Black oak	---	---	
						Yellow buckeye	---	---	
						Eastern hemlock	---	---	
						Sweet birch	---	---	

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
WaE, WaF-------- Wayah	4R	Severe	Severe	Slight	Slight	Northern red oak---- Black cherry-------- Red spruce---------- Fraser fir---------- American beech------ Yellow birch-------- Sugar maple--------- Black oak---------- Yellow buckeye------ Eastern hemlock----- Sweet birch---------	72 72 57 60 --- --- --- --- --- --- ---	54 --- 129 --- --- --- --- --- --- --- ---	Northern red oak, red spruce, Fraser fir***.
WeC------------- Wayah	2A	Slight	Slight	Severe	Slight	Northern red oak---- Red spruce---------- Fraser fir---------- Yellow birch-------- Sugar maple--------- Black cherry-------- Sweet birch---------	43 --- --- --- --- --- ---	28 --- --- --- --- --- ---	
WeD------------- Wayah	2R	Moderate	Moderate	Severe	Slight	Northern red oak---- Red spruce---------- Fraser fir---------- Yellow birch-------- Sugar maple--------- Black cherry-------- Sweet birch---------	43 --- --- --- --- --- ---	28 --- --- --- --- --- ---	
WeE, WeF-------- Wayah	2R	Severe	Severe	Severe	Slight	Northern red oak---- Red spruce---------- Fraser fir---------- Yellow birch-------- Sugar maple--------- Black cherry-------- Sweet birch---------	43 --- --- --- --- --- ---	28 --- --- --- --- --- ---	
WtB**: Whiteside------	7A	Slight	Slight	Slight	Slight	Yellow-poplar------- Eastern white pine-- Black cherry-------- Eastern hemlock----- Sugar maple--------- Red maple----------- White oak----------- Yellow birch-------- Sweet birch--------- Black locust--------	95 90 90 --- --- --- --- --- --- ---	98 166 --- --- --- --- --- --- --- ---	Eastern white pine, yellow-poplar, black cherry.

See footnotes at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	Volume*	
WtB**:									
Tuckasegee	8A	Slight	Slight	Slight	Slight	Yellow-poplar	109	122	Yellow-poplar, eastern white pine, northern red oak, black cherry, Fraser fir***.
						Eastern white pine	98	182	
						Northern red oak	---	---	
						Black cherry	---	---	
						Eastern hemlock	---	---	
						White oak	---	---	
						Yellow birch	---	---	
						American beech	---	---	
						Black locust	---	---	
						Yellow buckeye	---	---	
						Sugar maple	---	---	
						Red maple	---	---	
						Sweet birch	---	---	

* Volume is the yield in cubic feet per acre per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

** See description of the map unit for composition and behavior characteristics of the map unit.

*** Species is used for Christmas trees.

TABLE 8.--RECREATIONAL DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
BaA Biltmore	Severe: flooding, too sandy.	Severe: too sandy.	Severe: too sandy, flooding.	Severe: too sandy.	Severe: flooding.
BkB2 Braddock	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
BkC2 Braddock	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
BkD2 Braddock	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
BrC*: Braddock	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Urban land.					
BuD*: Burton	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: large stones, slope.	Severe: large stones, slope.
Craggey	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: large stones, depth to rock, slope.	Severe: fragile.	Severe: slope, depth to rock.
Rock outcrop.					
BuF*: Burton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: large stones, slope.
Craggey	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: large stones, depth to rock, slope.	Severe: slope, fragile.	Severe: slope, depth to rock.
Rock outcrop.					
CaC Cashiers	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, slope.
CaD Cashiers	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
CaE, CaF Cashiers	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
CdC---------- Chandler	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight----------	Moderate: small stones, slope.
CdD---------- Chandler	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
CdE, CdF---------- Chandler	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
CeC---------- Chandler	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight----------	Moderate: small stones, slope.
CeD---------- Chandler	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
CeE, CeF---------- Chandler	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
ChE, ChF---------- Cheoah	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
CnC*:					
Chestnut----------	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight----------	Moderate: small stones, droughty, slope.
Edneyville----------	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight----------	Moderate: small stones, droughty, slope.
CnD*:					
Chestnut----------	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
Edneyville----------	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
CnE*:					
Chestnut----------	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Edneyville----------	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
CpD*:					
Cleveland----------	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.	Severe: slope, depth to rock.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
CpD*:					
Chestnut	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
Rock outcrop.					
CpE*, CpF*:					
Cleveland	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
Chestnut	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Rock outcrop.					
CrD*:					
Cowee	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
Evard	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
Urban land.					
CsD	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: large stones.	Severe: large stones, slope.
CsE	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: large stones, slope.	Severe: large stones, slope.
CuC*:					
Cullasaja	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: large stones, slope, small stones.	Severe: large stones.	Severe: large stones.
Tuckasegee	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, large stones, slope.
CuD*:					
Cullasaja	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: large stones.	Severe: large stones, slope.
Tuckasegee	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
CuE*, CuF*:					
Cullasaja	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: large stones, slope.	Severe: large stones, slope.
Tuckasegee	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
CwA	Severe: flooding.	Moderate: wetness.	Moderate: small stones, wetness, flooding.	Moderate: wetness.	Moderate: wetness, flooding.
Cullowhee					
DfA	Severe: flooding.	Moderate: wetness.	Severe: small stones.	Slight	Severe: droughty.
Dellwood					
DrB	Severe: flooding.	Slight	Moderate: slope, wetness, percs slowly.	Slight	Slight.
Dillard					
DsB	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: large stones.
Dillsboro					
DsC	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: large stones, slope.
Dillsboro					
EdC*:					
Edneyville	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, droughty, slope.
Chestnut	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, droughty, slope.
EdD*:					
Edneyville	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
Chestnut	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
EdE*, EdF*:					
Edneyville	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Chestnut	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
EgB2 Ellijay	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
EgC2 Ellijay	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
EgD2 Ellijay	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
EvC*: Evard	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, large stones.
Cowee	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, slope, depth to rock.
EvD*: Evard	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
Cowee	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
EvE*, EvF*: Evard	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Cowee	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
FaC Fannin	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: small stones, slope.
FaD Fannin	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
FaE, FaF Fannin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
HpA Hemphill	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
JbD*: Junaluska	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
Brasstown	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
JbE*:					
Junaluska	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Brasstown	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
JtD*:					
Junaluska	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
Tsali	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Moderate: slope.	Severe: slope, depth to rock.
JtE*, JtF*:					
Junaluska	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Tsali	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
NkA	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Nikwasi					
OcD	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
Oconaluftee					
OcE, OcF	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Oconaluftee					
OwD	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
Oconaluftee					
OwE, OwF	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Oconaluftee					
Pt*.					
Pits, quarries					
PwD	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Plott					
PwE, PwF	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Plott					
RdA	Severe: flooding.	Moderate: wetness.	Moderate: small stones, wetness.	Slight	Moderate: droughty, flooding.
Reddies					

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
RkF*:					
Rock outcrop.					
Cleveland	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
RoA	Severe: flooding.	Slight	Moderate: flooding.	Slight	Moderate: flooding.
SaB	Slight	Slight	Severe: small stones.	Slight	Moderate: small stones.
SaC	Moderate: slope.	Moderate: slope.	Severe: slope, small stones.	Slight	Moderate: small stones, slope.
SaD, SbD	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
SoD*:					
Soco	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
Stecoah	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
SoE*, SoF*:					
Soco	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Stecoah	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
SrD*:					
Spivey	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Moderate: large stones.	Severe: slope.
Santeetlah	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
SrE*:					
Spivey	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: slope.	Severe: slope.
Santeetlah	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
SvB Statler	Severe: flooding.	Slight	Moderate: slope, small stones.	Slight	Slight.
SyA*: Sylva	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Whiteside	Moderate: wetness.	Moderate: wetness.	Moderate: small stones, wetness.	Moderate: wetness.	Moderate: wetness.
TaC*: Tanasee	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Balsam	Moderate: slope.	Moderate: slope.	Severe: slope, small stones, large stones.	Moderate: large stones.	Severe: large stones.
TaD*: Tanasee	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Balsam	Severe: slope.	Severe: slope.	Severe: slope, small stones, large stones.	Moderate: large stones, slope.	Severe: large stones, slope.
TaE*: Tanasee	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Balsam	Severe: slope.	Severe: slope.	Severe: slope, small stones, large stones.	Moderate: large stones, slope.	Severe: large stones, slope.
TrE, TrF Trimont	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
TwC*: Tuckasegee	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, large stones, slope.
Whiteside	Moderate: slope, wetness.	Moderate: slope, wetness.	Severe: slope.	Moderate: wetness.	Moderate: wetness.
Ud. Udorthents, loamy					
UfB*: Udorthents.					
Urban land.					

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
WaD---------- Wayah	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
WaE, WaF---------- Wayah	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
WeC---------- Wayah	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
WeD---------- Wayah	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
WeE, WeF---------- Wayah	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
WtB*: Whiteside----------	Moderate: wetness.	Moderate: wetness.	Moderate: slope, small stones, wetness.	Moderate: wetness.	Moderate: wetness.
Tuckasegee----------	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight----------	Moderate: small stones, large stones.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--WILDLIFE HABITAT

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
BaA---------- Biltmore	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
BkB2---------- Braddock	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BkC2---------- Braddock	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
BkD2---------- Braddock	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
BrC*: Braddock----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Urban land.										
BuD*: Burton----------	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
Craggey----------	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Fair	Very poor.
Rock outcrop.										
BuF*: Burton----------	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Craggey----------	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Fair	Very poor.
Rock outcrop.										
CaC---------- Cashiers	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CaD---------- Cashiers	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
CaE, CaF---------- Cashiers	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
CdC---------- Chandler	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
CdD---------- Chandler	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
CdE, CdF---------- Chandler	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
CeC, CeD, CeE, CeF- Chandler	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
ChE, ChF---------- Cheoah	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
CnC*: Chestnut----------	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Edneyville--------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CnD*: Chestnut----------	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Edneyville--------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
CnE*: Chestnut----------	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Edneyville--------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
CpD*: Cleveland---------	Very poor.	Very poor.	Poor	Fair	Fair	Very poor.	Very poor.	Very poor.	Poor	Very poor.
Chestnut----------	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Rock outcrop.										
CpE*, CpF*: Cleveland---------	Very poor.	Very poor.	Poor	Fair	Fair	Very poor.	Very poor.	Very poor.	Poor	Very poor.
Chestnut----------	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Rock outcrop.										
CrD*: Cowee----------	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Evard----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Urban land.										
CsD, CsE---------- Cullasaja	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
CuC*: Cullasaja---------	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Tuckasegee--------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
CuD*:										
Cullasaja	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Tuckasegee	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
CuE*, CuF*:										
Cullasaja	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Tuckasegee	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
CwA--Cullowhee	Fair	Good	Good	Fair	Fair	Fair	Fair	Good	Fair	Fair.
DfA--Dellwood	Fair	Good	Good	Fair	Fair	Very poor.	Very poor.	Good	Fair	Very poor.
DrB--Dillard	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
DsB--Dillsboro	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
DsC--Dillsboro	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
EdC*:										
Edneyville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Chestnut	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
EdD*:										
Edneyville	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Chestnut	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
EdE*, EdF*:										
Edneyville	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Chestnut	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
EgB2--Ellijay	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
EgC2--Ellijay	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
EgD2--Ellijay	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Fair	Very poor.

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
EvC*:										
Evard	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Cowee	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
EvD*:										
Evard	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Cowee	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
EvE*, EvF*:										
Evard	Very poor.	Very poor.	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Cowee	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
FaC	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Fannin										
FaD	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Fannin										
FaE, FaF	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Fannin										
HpA	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Hemphill										
JbD*:										
Junaluska	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Brasstown	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
JbE*:										
Junaluska	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Brasstown	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
JtD*:										
Junaluska	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Tsali	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Poor	Very poor.
JtE*, JtF*:										
Junaluska	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Tsali	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Poor	Very poor.

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
NkA---- Nikwasi	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
OcD---- Oconaluftee	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
OcE, OcF---- Oconaluftee	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
OwD---- Oconaluftee	Poor	Fair	Good	Very poor.	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
OwE, OwF---- Oconaluftee	Very poor.	Poor	Good	Very poor.	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Pt*. Pits, quarries										
PwD---- Plott	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
PwE, PwF---- Plott	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
RdA---- Reddies	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
RkF*: Rock outcrop.										
Cleveland----	Very poor.	Very poor.	Poor	Fair	Fair	Very poor.	Very poor.	Very poor.	Poor	Very poor.
RoA---- Rosman	Good	Good	Good	Good	Good	Fair	Very poor.	Good	Good	Very poor.
SaB---- Saunook	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
SaC---- Saunook	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
SaD, SbD---- Saunook	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Fair	Very poor.
SoD*: Soco----	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Stecoah----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
SoE*, SoF*: Soco----	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Stecoah----	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
SrD*:										
Spivey	Very poor.	Very poor.	Fair	Good	Poor	Very poor.	Very poor.	Poor	Fair	Very poor.
Santeetlah	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Fair	Very poor.
SrE*:										
Spivey	Very poor.	Very poor.	Fair	Good	Poor	Very poor.	Very poor.	Poor	Fair	Very poor.
Santeetlah	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
SvB	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Statler										
SyA*:										
Sylva	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Whiteside	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
TaC*:										
Tanasee	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Balsam	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
TaD*:										
Tanasee	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Balsam	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
TaE*:										
Tanasee	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Balsam	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
TrE, TrF	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Trimont										
TwC*:										
Tuckasegee	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Whiteside	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Ud.										
Udorthents, loamy										
UfB*:										
Udorthents.										

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
UfB*: Urban land.										
WaD---- Wayah	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
WaE, WaF---- Wayah	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
WeC---- Wayah	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
WeD---- Wayah	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
WeE, WeF---- Wayah	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
WtB*: Whiteside---	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Tuckasegee---	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--BUILDING SITE DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
BaA--- Biltmore	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.
BkB2--- Braddock	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
BkC2--- Braddock	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
BkD2--- Braddock	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
BrC*:						
Braddock---	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
Urban land.						
BuD*, BuF*:						
Burton---	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope.	Severe: large stones, slope.
Craggey---	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Rock outcrop.						
CaC--- Cashiers	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: small stones, slope.
CaD, CaE, CaF--- Cashiers	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, low strength.	Severe: slope.
CdC--- Chandler	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: small stones, slope.
CdD, CdE, CdF--- Chandler	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, low strength.	Severe: slope.
CeC--- Chandler	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: small stones, slope.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
CeD, CeE, CeF----- Chandler	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, low strength.	Severe: slope.
ChE, ChF---------- Cheoah	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
CnC*:						
Chestnut---------	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: small stones, droughty, slope.
Edneyville-------	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: small stones, droughty, slope.
CnD*, CnE*:						
Chestnut---------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Edneyville-------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
CpD*, CpE*, CpF*:						
Cleveland--------	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
Chestnut---------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.						
CrD*:						
Cowee------------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Evard------------	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Urban land.						
CsD, CsE---------- Cullasaja	Severe: cutbanks cave, large stones, slope.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: large stones, slope.
CuC*:						
Cullasaja--------	Severe: cutbanks cave, large stones.	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: large stones.
Tuckasegee-------	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: small stones, large stones, slope.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
CuD*, CuE*, CuF*:						
Cullasaja	Severe: cutbanks cave, large stones, slope.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: large stones, slope.
Tuckasegee	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
CwA	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Moderate: wetness, flooding.
Cullowhee						
DfA	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Severe: droughty.
Dellwood						
DrB	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Moderate: low strength, wetness.	Slight.
Dillard						
DsB	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Moderate: large stones.
Dillsboro						
DsC	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: large stones, slope.
Dillsboro						
EdC*:						
Edneyville	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: small stones, droughty, slope.
Chestnut	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: small stones, droughty, slope.
EdD*, EdE*, EdF*:						
Edneyville	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Chestnut	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
EgB2	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
Ellijay						
EgC2	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
Ellijay						
EgD2	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Ellijay						

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
EvC*:						
Evard	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: small stones, large stones.
Cowee	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: small stones, slope, depth to rock.
EvD*, EvE*, EvF*:						
Evard	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Cowee	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
FaC---------- Fannin	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: small stones, slope.
FaD, FaE, FaF----- Fannin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
HpA---------- Hemphill	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness.
JbD*, JbE*:						
Junaluska	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Brasstown	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
JtD*, JtE*, JtF*:						
Junaluska	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Tsali	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.
NkA---------- Nikwasi	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
OcD, OcE, OcF, OwD, OwE, OwF---- Oconaluftee	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Pt*. Pits, quarries						
PwD, PwE, PwF----- Plott	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
RdA---------- Reddies	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Moderate: droughty, flooding.
RkF*: Rock outcrop.						
Cleveland--------	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
RoA---------- Rosman	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
SaB---------- Saunook	Slight---------	Slight---------	Slight---------	Moderate: slope.	Moderate: low strength, frost action.	Moderate: small stones.
SaC---------- Saunook	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: small stones, slope.
SaD, SbD---------- Saunook	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
SoD*, SoE*, SoF*: Soco----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Stecoah----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
SrD*, SrE*: Spivey----------	Severe: large stones, slope.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope.
Santeetlah-------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
SvB---------- Statler	Slight---------	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Slight.
SyA*: Sylva----------	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
Whiteside--------	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, frost action.	Moderate: wetness.
TaC*: Tanasee----------	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
Balsam----------	Severe: large stones.	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Severe: large stones.	Severe: large stones.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
TaD*, TaE*:						
Tanasee	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Balsam	Severe: large stones, slope.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: large stones, slope.
TrE, TrF	Severe:	Severe:	Severe:	Severe:	Severe:	Severe:
Trimont	slope.	slope.	slope.	slope.	slope.	slope.
TwC*:						
Tuckasegee	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: small stones, large stones, slope.
Whiteside	Severe: cutbanks cave, wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Moderate: wetness, slope, frost action.	Moderate: wetness.
Ud.						
Udorthents, loamy						
UfB*:						
Udorthents.						
Urban land.						
WaD, WaE, WaF	Severe:	Severe:	Severe:	Severe:	Severe:	Severe:
Wayah	cutbanks cave, slope.	slope.	slope.	slope.	slope.	slope.
WeC	Severe:	Moderate:	Moderate:	Severe:	Moderate:	Moderate:
Wayah	cutbanks cave.	slope.	slope.	slope.	slope, frost action.	slope.
WeD, WeE, WeF	Severe:	Severe:	Severe:	Severe:	Severe:	Severe:
Wayah	cutbanks cave, slope.	slope.	slope.	slope.	slope.	slope.
WtB*:						
Whiteside	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Moderate: wetness, frost action.	Moderate: wetness.
Tuckasegee	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Moderate: small stones, large stones.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--SANITARY FACILITIES

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
BaA Biltmore	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage.	Poor: seepage, too sandy.
BkB2 Braddock	Moderate: percs slowly.	Severe: seepage.	Severe: seepage, too clayey.	Slight	Poor: too clayey, hard to pack.
BkC2 Braddock	Moderate: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage, too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
BkD2 Braddock	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
BrC*: Braddock	Moderate: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage, too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
Urban land.					
BuD*, BuF*: Burton	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, slope.
Craggey	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
Rock outcrop.					
CaC Cashiers	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: small stones, slope.
CaD, CaE, CaF Cashiers	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
CdC Chandler	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: hard to pack.
CdD, CdE, CdF Chandler	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: hard to pack, slope.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
CeC---------- Chandler	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: hard to pack.
CeD, CeE, CeF------- Chandler	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: hard to pack, slope.
ChE, ChF---------- Cheoah	Severe: slope.	Severe: seepage, slope.	Severe: depth to rock, seepage, slope.	Severe: seepage, slope.	Poor: slope.
CnC*: Chestnut----------	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones.
Edneyville---------	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: small stones, slope.
CnD*, CnE*: Chestnut----------	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
Edneyville---------	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
CpD*, CpE*, CpF*: Cleveland----------	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
Chestnut----------	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
Rock outcrop.					
CrD*: Cowee----------	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
Evard----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Urban land.					
CsD, CsE---------- Cullasaja	Severe: slope, large stones.	Severe: seepage, slope, large stones.	Severe: seepage, slope, large stones.	Severe: seepage, slope.	Poor: seepage, large stones, slope.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
CuC*:					
Cullasaja	Severe: large stones.	Severe: seepage, slope, large stones.	Severe: seepage, large stones.	Severe: seepage.	Poor: seepage, large stones.
Tuckasegee	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: large stones.
CuD*, CuE*, CuF*:					
Cullasaja	Severe: slope, large stones.	Severe: seepage, slope, large stones.	Severe: seepage, slope, large stones.	Severe: seepage, slope.	Poor: seepage, large stones, slope.
Tuckasegee	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: large stones, slope.
CwA--Cullowhee	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, small stones.
DfA--Dellwood	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, small stones.
DrB--Dillard	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Fair: too clayey.
DsB--Dillsboro	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
DsC--Dillsboro	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
EdC*:					
Edneyville	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: small stones, slope.
Chestnut	Severe: depth to rock.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones.
EdD*, EdE*, EdF*:					
Edneyville	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Chestnut	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
EgB2 Ellijay	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
EgC2 Ellijay	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
EgD2 Ellijay	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
EvC*: Evard	Moderate: slope.	Severe: slope.	Moderate: slope, too sandy.	Moderate: slope.	Fair: too sandy, small stones, slope.
Cowee	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock.
EvD*, EvE*, EvF*: Evard	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Cowee	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
FaC Fannin	Moderate: slope, percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: small stones, slope.
FaD, FaE, FaF Fannin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
HpA Hemphill	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
JbD*, JbE*: Junaluska	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
Brasstown	Severe: slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: slope.
JtD*, JtE*, JtF*: Junaluska	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
JtD*, JtE*, JtF*: Tsali	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.
NkA---------- Nikwasi	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, small stones.
OcD, OcE, OcF, OwD, OwE, OwF---------- Oconaluftee	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope.
Pt*. Pits, quarries					
PwD, PwE, PwF------- Plott	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
RdA---------- Reddies	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, small stones.
RkF*: Rock outcrop.					
Cleveland----------	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
RoA---------- Rosman	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Fair: wetness.
SaB---------- Saunook	Moderate: percs slowly.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: small stones.
SaC---------- Saunook	Moderate: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: small stones.
SaD, SbD---------- Saunook	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope.
SoD*, SoE*, SoF*: Soco----------	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, slope.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
SoD*, SoE*, SoF*:					
Stecoah	Severe: slope.	Severe: seepage, slope.	Severe: depth to rock, seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope.
SrD*, SrE*:					
Spivey	Severe: slope, large stones.	Severe: seepage, slope, large stones.	Severe: seepage, slope, large stones.	Severe: seepage, slope.	Poor: large stones, slope.
Santeetlah	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
SvB	Moderate: flooding, percs slowly.	Severe: seepage.	Severe: seepage.	Moderate: flooding.	Good.
Statler					
SyA*:					
Sylva	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: wetness.
Whiteside	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Fair: wetness.
TaC*:					
Tanasee	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: seepage, large stones.
Balsam	Severe: large stones.	Severe: seepage, slope, large stones.	Severe: seepage, large stones.	Severe: seepage.	Poor: large stones.
TaD*, TaE*:					
Tanasee	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: seepage, large stones, slope.
Balsam	Severe: slope, large stones.	Severe: seepage, slope, large stones.	Severe: seepage, slope, large stones.	Severe: seepage, slope.	Poor: large stones, slope.
TrE, TrF	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Trimont					
TwC*:					
Tuckasegee	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: large stones.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
TwC*:					
Whiteside	Severe: wetness.	Severe: seepage, slope, wetness.	Severe: seepage, wetness.	Severe: wetness.	Fair: slope, wetness.
Ud.					
Udorthents, loamy					
UfB*:					
Udorthents.					
Urban land.					
WaD, WaE, WaF	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope.
WeC	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Poor: small stones.
WeD, WeE, WeF	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope.
WtB*:					
Whiteside	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Fair: wetness.
Tuckasegee	Slight	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: large stones.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--CONSTRUCTION MATERIALS

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
BaA Biltmore	Good	Probable	Improbable: too sandy.	Poor: too sandy.
BkB2, BkC2 Braddock	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, area reclaim, small stones.
BkD2 Braddock	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, area reclaim, small stones.
BrC*: Braddock	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, area reclaim, small stones.
Urban land.				
BuD*: Burton	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones, slope.
Craggey	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, large stones, slope.
Rock outcrop.				
BuF*: Burton	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones, slope.
Craggey	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, large stones, slope.
Rock outcrop.				
CaC Cashiers	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
CaD Cashiers	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
CaE, CaF Cashiers	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
CdC Chandler	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
CdD Chandler	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
CdE, CdF Chandler	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
CeC Chandler	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
CeD Chandler	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
CeE, CeF Chandler	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
ChE, ChF Cheoah	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
CnC*: Chestnut	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones.
Edneyville	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
CnD*: Chestnut	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones, slope.
Edneyville	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
CnE*: Chestnut	Poor: depth to rock, slope.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones, slope.
Edneyville	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
CpD*:				
Cleveland	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Chestnut	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones, slope.
Rock outcrop.				
CpE*, CpF*:				
Cleveland	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
Chestnut	Poor: depth to rock, slope.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones, slope.
Rock outcrop.				
CrD*:				
Cowee	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Evard	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Urban land.				
CsD--- Cullasaja	Poor: large stones.	Improbable: large stones.	Improbable: large stones.	Poor: large stones, area reclaim, slope.
CsE--- Cullasaja	Poor: large stones, slope.	Improbable: large stones.	Improbable: large stones.	Poor: large stones, area reclaim, slope.
CuC*:				
Cullasaja	Poor: large stones.	Improbable: large stones.	Improbable: large stones.	Poor: large stones, area reclaim.
Tuckasegee	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
CuD*:				
Cullasaja	Poor: large stones.	Improbable: large stones.	Improbable: large stones.	Poor: large stones, area reclaim, slope.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
CuD*:				
Tuckasegee	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
CuE*, CuF*:				
Cullasaja	Poor: large stones, slope.	Improbable: large stones.	Improbable: large stones.	Poor: large stones, area reclaim, slope.
Tuckasegee	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
CwA	Fair: wetness.	Probable	Probable	Poor: small stones, area reclaim.
Cullowhee				
DfA	Fair: large stones, wetness.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
Dellwood				
DrB	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Dillard				
DsB, DsC	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, area reclaim.
Dillsboro				
EdC*:				
Edneyville	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Chestnut	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones.
EdD*:				
Edneyville	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Chestnut	Poor: depth to rock.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones, slope.
EdE*, EdF*:				
Edneyville	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Chestnut	Poor: depth to rock, slope.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: small stones, slope.
EgB2, EgC2	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Ellijay				

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
EgD2 Ellijay	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
EvC*: Evard	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Cowee	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
EvD*: Evard	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Cowee	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
EvE*, EvF*: Evard	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Cowee	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
FaC Fannin	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
FaD Fannin	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
FaE, FaF Fannin	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
HpA Hemphill	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
JbD*: Junaluska	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Brasstown	Fair: depth to rock, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
JbE*: Junaluska	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
JbE*:				
Brasstown	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
JtD*:				
Junaluska	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Tsali	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
JtE*, JtF*:				
Junaluska	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Tsali	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
NkA Nikwasi	Poor: wetness.	Probable	Probable	Poor: small stones, area reclaim, wetness.
OcD Oconaluftee	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
OcE, OcF Oconaluftee	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
OwD Oconaluftee	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
OwE, OwF Oconaluftee	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Pt*. Pits, quarries				
PwD Plott	Fair: slope.	Probable	Probable	Poor: slope.
PwE, PwF Plott	Poor: slope.	Probable	Probable	Poor: slope.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
RdA Reddies	Fair: wetness.	Probable	Probable	Poor: small stones, area reclaim.
RkF*: Rock outcrop.				
Cleveland	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, small stones, slope.
RoA Rosman	Fair: wetness.	Probable	Probable	Fair: small stones, area reclaim.
SaB, SaC Saunook	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones.
SaD, SbD Saunook	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
SoD*: Soco	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Stecoah	Fair: depth to rock, thin layer, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
SoE*, SoF*: Soco	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Stecoah	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
SrD*: Spivey	Poor: large stones.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: area reclaim, small stones, slope.
Santeetlah	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
SrE*: Spivey	Poor: large stones, slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: area reclaim, small stones, slope.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
SrE*:				
Santeetlah	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
SvB	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Statler				
SyA*:				
Sylva	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Whiteside	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
TaC*:				
Tanasee	Good	Probable	Probable	Poor: area reclaim, small stones.
Balsam	Poor: large stones.	Improbable: large stones.	Improbable: large stones.	Poor: large stones, area reclaim.
TaD*:				
Tanasee	Fair: slope.	Probable	Probable	Poor: area reclaim, small stones, slope.
Balsam	Poor: large stones.	Improbable: large stones.	Improbable: large stones.	Poor: large stones, area reclaim, slope.
TaE*:				
Tanasee	Poor: slope.	Probable	Probable	Poor: area reclaim, small stones, slope.
Balsam	Poor: large stones.	Improbable: large stones.	Improbable: large stones.	Poor: large stones, area reclaim, slope.
TrE, TrF	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Trimont				
TwC*:				
Tuckasegee	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
TwC*:				
Whiteside	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
Ud.				
Udorthents, loamy				
UfB*:				
Udorthents.				
Urban land.				
WaD	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Wayah				
WaE, WaF	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Wayah				
WeC	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
Wayah				
WeD	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Wayah				
WeE, WeF	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Wayah				
WtB*:				
Whiteside	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
Tuckasegee	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--WATER MANAGEMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
BaA---------- Biltmore	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
BkB2---------- Braddock	Severe: seepage.	Moderate: hard to pack.	Deep to water	Slope----------	Favorable------	Favorable.
BkC2, BkD2-------- Braddock	Severe: seepage, slope.	Moderate: hard to pack.	Deep to water	Slope----------	Slope----------	Slope.
BrC*:						
Braddock---------	Severe: seepage, slope.	Moderate: hard to pack.	Deep to water	Slope----------	Slope----------	Slope.
Urban land.						
BuD*, BuF*:						
Burton----------	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, large stones, droughty.	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.
Craggey----------	Severe: depth to rock, slope.	Severe: seepage, thin layer.	Deep to water	Slope, large stones, depth to rock.	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.
Rock outcrop.						
CaC, CaD, CaE, CaF---------- Cashiers	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, soil blowing.	Slope, soil blowing.	Slope.
CdC, CdD, CdE, CdF, CeC, CeD, CeE, CeF--------- Chandler	Severe: seepage, slope.	Severe: piping, hard to pack.	Deep to water	Slope, soil blowing.	Slope, soil blowing.	Slope.
ChE, ChF---------- Cheoah	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope----------	Slope----------	Slope.
CnC*, CnD*, CnE*:						
Chestnut---------	Severe: seepage, slope.	Severe: piping, thin layer.	Deep to water	Slope, droughty, depth to rock.	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.
Edneyville-------	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, droughty.	Slope----------	Slope, droughty.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
CpD*, CpE*, CpF*:						
Cleveland	Severe: depth to rock, slope.	Severe: piping.	Deep to water	Slope, droughty.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
Chestnut	Severe: seepage, slope.	Severe: piping, thin layer.	Deep to water	Slope, droughty, depth to rock.	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.
Rock outcrop.						
CrD*:						
Cowee	Severe: slope.	Severe: thin layer, piping.	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
Evard	Severe: slope.	Severe: seepage, piping.	Deep to water	Slope	Slope, too sandy.	Slope.
Urban land.						
CsD, CsE	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Slope, large stones, droughty.	Slope, large stones, too sandy.	Large stones, slope, droughty.
CuC*, CuD*, CuE*, CuF*:						
Cullasaja	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Slope, large stones, droughty.	Slope, large stones, too sandy.	Large stones, slope, droughty.
Tuckasegee	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope	Slope, large stones.	Large stones, slope.
CwA	Severe: seepage.	Severe: seepage, wetness.	Flooding, large stones, cutbanks cave.	Wetness, droughty, flooding.	Wetness, too sandy.	Droughty.
DfA	Severe: seepage.	Severe: seepage, large stones.	Flooding, large stones.	Large stones, wetness, droughty.	Large stones, wetness, too sandy.	Large stones, droughty.
DrB	Slight	Moderate: thin layer.	Slope	Slope, wetness.	Wetness	Favorable.
DsB	Moderate: seepage, slope.	Severe: hard to pack.	Deep to water	Slope, soil blowing.	Soil blowing	Favorable.
DsC	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, soil blowing.	Slope, soil blowing.	Slope.
EdC*, EdD*, EdE*, EdF*:						
Edneyville	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, droughty.	Slope	Slope, droughty.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
EdC*, EdD*, EdE*, EdF*:						
Chestnut	Severe: seepage, slope.	Severe: piping, thin layer.	Deep to water	Slope, droughty, depth to rock.	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.
EgB2 Ellijay	Moderate: seepage, slope.	Severe: hard to pack.	Deep to water	Slope	Favorable	Favorable.
EgC2, EgD2 Ellijay	Severe: slope.	Severe: hard to pack.	Deep to water	Slope	Slope	Slope.
EvC*, EvD*, EvE*, EvF*:						
Evard	Severe: slope.	Severe: seepage, piping.	Deep to water	Slope	Slope, too sandy.	Slope.
Cowee	Severe: slope.	Severe: thin layer, piping.	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
FaC, FaD, FaE, FaF Fannin	Severe: slope.	Severe: piping.	Deep to water	Slope	Slope	Slope.
HpA Hemphill	Slight	Severe: hard to pack, wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
JbD*, JbE*:						
Junaluska	Severe: seepage, slope.	Severe: thin layer.	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
Brasstown	Severe: slope.	Severe: piping.	Deep to water	Slope	Slope	Slope.
JtD*, JtE*, JtF*:						
Junaluska	Severe: seepage, slope.	Severe: thin layer.	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
Tsali	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
NkA Nikwasi	Severe: seepage.	Severe: seepage, wetness.	Flooding, large stones, cutbanks cave.	Wetness, droughty, flooding.	Large stones, wetness, too sandy.	Large stones, wetness, droughty.
OcD, OcE, OcF, OwD, OwE, OwF Oconaluftee	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope	Slope	Slope.
Pt*. Pits, quarries						

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
PwD, PwE, PwF----- Plott	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope----------	Slope----------	Slope.
RdA---------- Reddies	Severe: seepage.	Severe: seepage.	Flooding, large stones, cutbanks cave.	Wetness, droughty.	Large stones, wetness, too sandy.	Large stones, droughty.
RkF*: Rock outcrop.						
Cleveland--------	Severe: depth to rock, slope.	Severe: piping.	Deep to water	Slope, droughty.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
RoA---------- Rosman	Severe: seepage.	Severe: piping.	Flooding-------	Flooding, soil blowing.	Wetness, soil blowing.	Favorable.
SaB---------- Saunook	Severe: seepage.	Severe: piping.	Deep to water	Slope----------	Favorable------	Favorable.
SaC, SaD, SbD----- Saunook	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope----------	Slope----------	Slope.
SoD*, SoE*, SoF*: Soco----------	Severe: seepage, slope.	Severe: piping, thin layer.	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
Stecoah----------	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope----------	Slope----------	Slope.
SrD*, SrE*: Spivey----------	Severe: seepage, slope.	Severe: large stones.	Deep to water	Slope, large stones, droughty.	Slope, large stones.	Large stones, slope, droughty.
Santeetlah-------	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope----------	Slope----------	Slope.
SvB---------- Statler	Severe: seepage.	Severe: piping.	Deep to water	Slope----------	Favorable------	Favorable.
SyA*: Sylva----------	Severe: seepage.	Severe: piping, wetness.	Frost action---	Wetness--------	Wetness--------	Wetness.
Whiteside--------	Severe: seepage.	Severe: piping, wetness.	Favorable------	Wetness--------	Wetness--------	Favorable.
TaC*, TaD*, TaE*: Tanasee----------	Severe: seepage, slope.	Severe: seepage.	Deep to water	Slope, soil blowing.	Slope, large stones, too sandy.	Large stones, slope.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
TaC*, TaD*, TaE*: Balsam	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Slope, large stones, droughty.	Slope, large stones.	Large stones, slope, droughty.
TrE, TrF: Trimont	Severe: slope.	Severe: piping.	Deep to water	Slope	Slope	Slope.
TwC*: Tuckasegee	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope	Slope, large stones.	Large stones, slope.
Whiteside	Severe: seepage, slope.	Severe: piping, wetness.	Slope	Slope, wetness.	Slope, wetness.	Slope.
Ud. Udorthents, loamy						
UfB*: Udorthents.						
Urban land.						
WaD, WaE, WaF, WeC, WeD, WeE, WeF: Wayah	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope	Slope	Slope.
WtB*: Whiteside	Severe: seepage.	Severe: piping, wetness.	Slope	Slope, wetness.	Wetness	Favorable.
Tuckasegee	Severe: seepage.	Severe: piping.	Deep to water	Slope	Large stones	Large stones.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--ENGINEERING INDEX PROPERTIES

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated)

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	>3 inches	4	10	40	200		
	In				Pct					Pct	
BaA----------	0-10	Sand----------	SM, SP-SM	A-2-4	0-5	95-100	90-100	55-88	10-35	<20	NP
Biltmore	10-60	Loamy sand, sand, fine sand.	SM, SP-SM	A-2-4	0-8	95-100	85-100	55-96	5-35	<20	NP
BkB2, BkC2, BkD2-	0-8	Clay loam--------	CL	A-6, A-7	0-5	80-100	75-100	65-95	50-85	35-50	15-26
Braddock	8-60	Clay loam, gravelly clay, clay.	CH, CL, SC, MH	A-7	0-15	80-100	65-100	55-95	40-90	42-66	15-35
BrC*:											
Braddock--------	0-8	Clay loam--------	CL	A-6, A-7	0-5	80-100	75-100	65-95	50-85	35-50	15-26
	8-60	Clay loam, gravelly clay, clay.	CH, CL, SC, MH	A-7	0-15	80-100	65-100	55-95	40-90	42-66	15-35
Urban land.											
BuD*:											
Burton----------	0-12	Cobbly sandy loam	SM	A-2, A-4, A-5	5-35	80-95	75-95	60-90	25-45	30-50	NP-7
	12-22	Cobbly sandy loam, very cobbly fine sandy loam, stony sandy loam.	SM, GM, SP-SM, SC-SM	A-2, A-1-b	10-35	45-75	40-65	35-55	10-30	25-35	NP-7
	22-36	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Craggey---------	0-16	Cobbly sandy loam	SM, SC-SM	A-2, A-4, A-5	15-35	80-95	75-95	60-90	25-49	<50	NP-7
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
BuF*:											
Burton----------	0-12	Cobbly sandy loam	SM	A-2, A-4, A-5	5-35	80-95	75-95	60-90	25-45	30-50	NP-7
	12-22	Cobbly sandy loam, very cobbly fine sandy loam, stony sandy loam.	SM, GM, SP-SM, SC-SM	A-2, A-1-b	10-35	45-75	40-65	35-55	10-30	25-35	NP-7
	22-36	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Craggey---------	0-16	Cobbly sandy loam	SM, SC-SM	A-2, A-4, A-5	15-35	80-95	75-95	60-90	25-49	<50	NP-7
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments >3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
CaC, CaD, CaE, CaF---------- Cashiers	0-9	Gravelly fine sandy loam.	SM, SC-SM	A-2-4, A-4, A-1, A-5	5-15	70-85	60-75	30-65	20-50	<50	NP-7
	9-48	Sandy loam, fine sandy loam, gravelly sandy loam.	SM, ML, SC-SM, CL-ML	A-2-4, A-4	0-5	70-95	60-95	50-85	25-65	<35	NP-7
	48-65	Gravelly sandy loam, gravelly fine sandy loam, sandy loam.	SM, SC-SM	A-2-4, A-4, A-1-b	0-15	70-95	60-95	30-75	20-50	<35	NP-7
CdC, CdD, CdE, CdF, CeC, CeD, CeE, CeF-------- Chandler	0-7	Gravelly fine sandy loam.	SM	A-2-4, A-4, A-1, A-5	0-15	70-85	60-75	30-65	20-50	30-50	NP-7
	7-99	Loam, fine sandy loam, sandy loam.	ML, SM, MH	A-2, A-4, A-5	0-15	90-100	85-100	60-85	25-65	30-60	NP-7
ChE, ChF--------- Cheoah	0-15	Channery loam----	SM, GM, ML, MH	A-4, A-7-5, A-5	5-15	70-95	55-90	40-80	36-65	30-64	NP-11
	15-56	Channery loam, channery fine sandy loam, channery silt loam.	SM, SC, ML, CL	A-4	5-15	70-95	55-90	40-84	36-65	25-36	NP-10
	56-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
CnC*, CnD*, CnE*: Chestnut--------	0-3	Gravelly fine sandy loam.	SM, SC-SM	A-4, A-2, A-5	5-15	75-95	65-90	60-85	30-49	<50	NP-7
	3-28	Gravelly loam, gravelly fine sandy loam, sandy loam.	SM, SC-SM	A-4, A-2, A-5	0-25	75-98	65-97	60-85	34-49	<45	NP-10
	28-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Edneyville------	0-5	Gravelly fine sandy loam.	SM, SC-SM, ML, MH	A-2, A-4, A-5	0-10	75-95	65-80	60-75	30-52	25-61	NP-7
	5-37	Fine sandy loam, sandy loam, loam.	SM, SC-SM, ML, CL-ML	A-2, A-4, A-5	0-5	85-100	80-100	65-95	30-68	25-45	NP-10
	37-60	Sandy loam, gravelly sandy loam, fine sandy loam.	SM, SC-SM	A-2, A-4, A-5	0-10	75-100	65-100	60-88	28-49	25-45	NP-10
CpD*, CpE*, CpF*: Cleveland-------	0-5	Sandy loam-------	SM	A-2, A-4	2-5	80-95	75-90	60-80	20-50	<30	NP-3
	5-17	Sandy loam, loam	SM	A-2, A-4	2-5	80-95	75-90	60-80	20-50	<30	NP-3
	17	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments >3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
CpD*, CpE*, CpF*:											
Chestnut--------	0-3	Gravelly fine sandy loam.	SM, SC-SM	A-4, A-2, A-5	5-15	75-95	65-90	60-85	30-49	<50	NP-7
	3-28	Gravelly loam, gravelly fine sandy loam, sandy loam.	SM, SC-SM	A-4, A-2, A-5	0-25	75-98	65-97	60-85	34-49	<45	NP-10
	28-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Rock outcrop.											
CrD*:											
Cowee----------	0-5	Gravelly sandy loam.	SM, SC-SM, ML	A-2-4, A-4, A-5, A-2	0-15	75-95	65-85	55-75	20-51	26-41	NP-12
	5-27	Gravelly sandy clay loam, gravelly sandy loam, clay loam.	SC, CL, ML, SM	A-4, A-6, A-7, A-2	0-15	47-99	45-90	32-85	17-60	26-56	5-22
	27-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Evard----------	0-6	Gravelly loam----	SM	A-2	0-15	65-85	60-80	55-75	15-35	<30	NP-4
	6-27	Sandy clay loam, clay loam, loam.	SM, SC, ML, CL	A-2, A-4, A-6, A-7-6	0-2	90-100	85-100	60-95	30-70	25-45	7-18
	27-35	Sandy loam, loam, sandy clay loam.	SC-SM, ML, CL, SC-SM	A-2, A-4	0-5	80-100	75-100	60-95	20-55	<25	NP-9
	35-60	Sandy loam, loam, loamy sand.	SM	A-2, A-4	0-15	75-100	70-100	60-90	15-50	---	NP
Urban land.											
CsD, CsE---------	0-13	Very cobbly fine sandy loam.	SM, GM	A-1-b, A-2-5	30-60	55-85	50-75	35-60	15-30	41-70	NP-7
Cullasaja	13-60	Very stony sandy loam, very bouldery fine sandy loam, very stony loam.	SM, GM	A-1-b, A-2-4	30-60	55-85	50-75	35-60	15-30	<40	NP-7
CuC*, CuD*, CuE*, CuF*:											
Cullasaja------	0-13	Very cobbly fine sandy loam.	SM, GM	A-1-b, A-2-5	30-60	55-85	50-75	35-60	15-30	41-70	NP-7
	13-60	Very stony sandy loam, very stony fine sandy loam, very stony loam.	SM, GM	A-1-b, A-2-4	30-60	55-85	50-75	35-60	15-30	25-40	NP-7
Tuckasegee-----	0-11	Gravelly loam----	SM	A-2, A-4, A-5, A-1-b	5-15	70-85	60-75	30-65	20-50	19-50	NP-10
	11-60	Gravelly fine sandy loam, loam, gravelly loam, gravelly sandy clay loam.	SM, ML, GM	A-4	2-15	70-100	65-100	55-95	36-65	<40	NP-10

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	>3 inches	4	10	40	200		
	In				Pct					Pct	
CwA---------- Cullowhee	0-13	Fine sandy loam	SM, ML	A-2-4, A-4	0-5	90-100	80-100	50-97	25-55	<35	NP-4
	13-23	Loamy sand, sand, gravelly loamy sand.	SM, SP-SM	A-2-4, A-1-b, A-3	0-15	70-100	65-95	30-89	2-25	---	NP
	23-35	Loamy sand, loamy fine sand, sandy loam.	SM, SP-SM	A-2-4, A-1-b	0-5	90-100	85-95	40-89	10-35	<25	NP-4
	35-65	Extremely gravelly sand, very gravelly sand, very cobbly sand.	GP-GM, GM, SM, SP-SM	A-1	10-50	13-75	10-55	6-40	1-15	---	NP
DfA---------- Dellwood	0-16	Gravelly fine sandy loam.	SM	A-2-4, A-4, A-1-b	0-15	70-85	60-75	30-65	15-45	<37	NP-4
	16-60	Extremely gravelly sand, very gravelly sand, very gravelly loamy sand.	GM, GP-GM, GP, SP	A-1	10-25	13-75	10-55	4-40	1-15	<20	NP
DrB---------- Dillard	0-9	Loam----------	ML, CL	A-4	0-2	95-100	90-100	75-95	60-85	<35	NP-10
	9-70	Clay loam, sandy clay loam, loam.	CL, ML, SC	A-4, A-6, A-7	0-2	95-100	85-100	60-95	45-70	30-45	7-22
DsB, DsC--------- Dillsboro	0-10	Loam----------	SM, SC, CL, ML	A-4, A-6, A-7-6	0-10	90-100	85-100	80-96	40-75	<42	NP-15
	10-43	Clay loam, clay	CL, CH, ML, MH	A-7	0-5	95-100	90-100	80-99	65-90	40-60	11-35
	43-59	Very cobbly clay loam, very cobbly clay, cobbly clay loam.	CL, GC, SC	A-7, A-2, A-6	20-60	50-90	40-75	30-70	20-60	35-50	11-30
	59-75	Very cobbly clay loam, cobbly clay loam, cobbly sandy clay loam.	CL, GC, SC, SM	A-7, A-2, A-6	20-60	50-90	40-85	20-65	15-60	25-50	10-25
EdC*, EdD*, EdE*, EdF*: Edneyville-----	0-5	Gravelly fine sandy loam.	SM, SC-SM, ML, MH	A-2, A-4, A-5	0-10	75-95	65-80	60-75	30-52	25-61	NP-7
	5-37	Fine sandy loam, sandy loam, loam.	SM, SC-SM, ML, CL-ML	A-2, A-4, A-5	0-5	85-100	80-100	65-95	30-68	25-45	NP-10
	37-60	Sandy loam, gravelly sandy loam, fine sandy loam.	SM, SC-SM	A-2, A-4, A-5	0-10	75-100	65-100	60-88	28-49	25-45	NP-10

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>3 inches	4	10	40	200		
	In				Pct					Pct	
EdC*, EdD*, EdE*, EdF*:											
Chestnut	0-3	Gravelly fine sandy loam.	SM, SC-SM	A-4, A-2, A-5	5-15	75-95	65-90	60-85	30-49	<50	NP-7
	3-28	Gravelly loam, gravelly fine sandy loam, sandy loam.	SM, SC-SM	A-4, A-2, A-5	0-25	75-98	65-97	60-85	34-49	<45	NP-10
	28-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
EgB2, EgC2, EgD2-Ellijay	0-4	Silty clay loam	ML	A-6, A-7	0-5	90-100	85-100	70-95	50-90	36-50	11-20
	4-34	Clay, clay loam, silty clay loam.	MH, ML	A-7	0-5	90-100	85-100	75-96	60-90	41-80	14-35
	34-52	Loam, clay loam, silty clay loam.	ML	A-6, A-7, A-5	0-5	90-100	85-100	70-95	50-90	36-50	9-20
	52-70	Loam, clay loam, fine sandy loam.	SM, SC, ML, CL	A-4, A-6, A-2-4	0-5	90-100	80-100	65-90	25-70	25-40	NP-15
EvC*, EvD*, EvE*, EvF*:											
Evard	0-6	Gravelly loam	SM	A-2	0-15	65-85	60-80	55-75	15-35	<30	NP-4
	6-27	Sandy clay loam, clay loam, loam.	SM, SC, ML, CL	A-2, A-4, A-6, A-7-6	0-2	90-100	85-100	60-95	30-70	25-45	7-18
	27-35	Sandy loam, loam, sandy clay loam.	SC-SM, ML, CL, SC-SM	A-2, A-4	0-5	80-100	75-100	60-95	20-55	<25	NP-9
	35-60	Sandy loam, loam, loamy sand.	SM	A-2, A-4	0-15	75-100	70-100	60-90	15-50	---	NP
Cowee	0-5	Gravelly sandy loam.	SM, SC-SM, ML	A-2-4, A-4, A-5, A-2	0-15	75-95	65-85	55-75	20-51	26-41	NP-12
	5-27	Gravelly sandy clay loam, gravelly sandy loam, clay loam.	SC, CL, ML, SM	A-4, A-6, A-7, A-2	0-15	47-99	45-90	32-85	17-60	26-56	5-22
	27-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
FaC, FaD, FaE, FaF-Fannin	0-6	Fine sandy loam	ML, SM, MH	A-4, A-2, A-5, A-7-5	0-5	92-100	86-100	60-95	34-85	30-51	NP-18
	6-24	Clay loam, sandy clay loam, loam.	ML, MH, SM	A-4, A-7, A-6	2-10	97-100	90-100	67-95	40-85	30-55	5-23
	24-60	Loam, sandy loam, fine sandy loam.	SM, ML	A-2, A-4, A-5	0-15	75-100	70-98	60-90	15-70	30-50	NP-10
HpA-Hemphill	0-13	Clay loam	CL, CH	A-6, A-7	0	95-100	95-100	85-100	60-90	30-52	11-25
	13-38	Clay, silty clay, clay loam.	CL, CH, MH, ML	A-6, A-7	0	95-100	95-100	85-100	65-95	30-60	11-29
	38-64	Fine sandy loam, loam, clay loam.	SM, SC-SM, CL-ML, ML	A-4, A-5, A-6, A-7	0	95-100	90-100	65-100	40-90	25-50	NP-16
	64-80	Variable	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments >3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
JbD*, JbE*:											
Junaluska	0-3	Channery fine sandy loam.	SM, ML, MH, GM	A-4, A-5, A-2-4, A-7	5-15	70-96	55-91	40-80	30-55	29-56	NP-14
	3-28	Channery loam, channery clay loam, sandy clay loam.	CL, ML, SC, SM	A-6, A-7	5-15	75-100	60-100	55-95	40-73	29-50	10-20
	28-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Brasstown	0-4	Channery fine sandy loam.	SM, GM, ML, MH	A-4, A-5, A-7-5	2-15	70-95	70-90	40-80	35-55	30-57	NP-14
	4-45	Channery loam, channery sandy clay loam, sandy clay loam.	CL, ML, SC, SM	A-6, A-7-6	2-15	75-100	70-100	55-97	40-73	35-50	11-20
	45-50	Channery fine sandy loam, channery very fine sandy loam, loam.	SM, GM, ML	A-4	2-15	70-100	70-100	40-96	35-55	25-35	NP-10
	50-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
JtD*, JtE*, JtF*:											
Junaluska	0-3	Channery fine sandy loam.	SM, ML, MH, GM	A-4, A-5, A-2-4, A-7	5-15	70-96	55-91	40-80	30-55	29-56	NP-14
	3-28	Channery loam, channery clay loam, sandy clay loam.	CL, ML, SC, SM	A-6, A-7	5-15	75-100	60-100	55-95	40-73	29-50	10-20
	28-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Tsali	0-6	Channery fine sandy loam.	SM, ML	A-4, A-5	5-15	70-95	55-90	40-80	35-55	30-50	NP-10
	6-16	Channery sandy clay loam, channery loam, channery clay loam.	CL, ML, SC, SM	A-6, A-7	5-15	75-95	60-90	55-80	40-70	30-50	11-20
	16-40	Weathered bedrock	---	---	---	---	---	---	---	---	---
NkA	0-26	Fine sandy loam	SM, ML	A-2-4, A-4	0-5	90-100	80-99	50-93	17-55	<37	NP-4
Nikwasi	26-60	Extremely gravelly coarse sand, very gravelly sand, very cobbly loamy sand.	GP-GM, GM, SM, SP-SM	A-1	10-50	25-75	10-55	7-40	1-15	---	NP

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>3 inches	4	10	40	200		
	In				Pct					Pct	
OcD, OcE, OcF, OwD, OwE, OwF--- Oconaluftee	0-8	Channery loam----	SM, ML, GM	A-4, A-5	5-15	70-95	55-90	40-80	36-65	30-75	NP-7
	8-19	Channery loam, channery silt loam, channery fine sandy loam.	SM, ML, GM	A-4, A-5	5-15	70-95	55-90	40-80	36-65	30-45	NP-7
	19-35	Channery loam, fine sandy loam, channery fine sandy loam.	SM, SC, ML, CL	A-4, A-5	5-15	70-100	55-100	40-94	36-77	25-45	NP-10
	35-67	Channery loam, fine sandy loam, channery fine sandy loam.	SM, SC, ML, CL	A-4, A-5	5-15	70-100	55-100	40-91	36-69	25-45	NP-10
Pt*. Pits, quarries											
PwD, PwE, PwF---- Plott	0-8	Fine sandy loam	SM, ML, MH	A-2, A-4, A-5	0-5	90-100	80-99	50-85	25-70	30-67	NP-7
	8-18	Loam, gravelly fine sandy loam, sandy loam, gravelly loam.	SM, SC-SM, ML, CL-ML	A-2, A-4, A-5, A-1-b	0-10	70-100	60-95	30-85	20-70	25-44	NP-10
	18-60	Gravelly fine sandy loam, cobbly sandy loam, cobbly fine sandy loam.	SM, SC-SM, SP-SM, GM	A-2-4, A-1-b	5-15	58-92	56-89	20-72	10-30	25-36	NP-7
RdA---------- Reddies	0-14	Fine sandy loam	SM, ML	A-2-4, A-4	0-5	90-100	80-100	50-95	25-55	25-37	NP-7
	14-26	Fine sandy loam, sandy loam, gravelly sandy loam.	SM, ML	A-2-4, A-4, A-1-b	0-15	70-100	60-95	30-85	15-55	25-35	NP-7
	26-60	Extremely gravelly sand, very gravelly sand, very cobbly sand.	GM, GP-GM, SM, SP-SM	A-1	10-50	13-75	10-55	4-40	1-15	<25	NP
RkF*: Rock outcrop.											
Cleveland------- Cleveland------- Cleveland-------	0-5	Sandy loam-------	SM	A-2, A-4	2-5	80-95	75-90	60-80	20-50	<30	NP-3
	5-17	Loam, sandy loam.	SM	A-2, A-4	2-5	80-95	75-90	60-80	20-50	<30	NP-3
	17	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
RoA---------- Rosman	0-13	Fine sandy loam	ML, SM, SC-SM	A-2-4, A-4, A-2-5, A-5	0	95-100	90-100	75-100	30-60	<41	NP-7
	13-73	Loam, fine sandy loam, sandy loam.	ML, SM, SC-SM	A-2-4, A-4	0	95-100	90-100	75-100	30-85	<39	NP-8

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>3 inches	4	10	40	200		
	In				Pct					Pct	
SaB, SaC, SaD, SbD---------- Saunook	0-9	Gravelly loam----	SM, MH, ML	A-2, A-4, A-1, A-5	5-15	70-85	60-75	30-65	20-55	30-59	NP-14
	9-24	Gravelly sandy clay loam, gravelly clay loam, cobbly loam.	SC, CL, ML, GM	A-4, A-6, A-2-4, A-2-6	5-25	55-99	55-97	45-83	30-55	25-45	7-17
	24-60	Sandy loam, cobbly fine sandy loam, gravelly sandy loam.	SM, GM	A-4, A-1-b, A-2-4	15-35	55-80	55-80	30-75	20-50	25-40	NP-10
SoD*, SoE*, SoF*: Soco----------	0-4	Channery loam----	SM, ML, GM, MH	A-4, A-5	5-15	70-96	55-92	40-83	36-65	20-55	NP-7
	4-24	Loam, fine sandy loam, silt loam.	SM, SC, ML, CL	A-4, A-6	0-5	85-100	80-100	65-92	36-77	25-40	NP-11
	24-35	Channery loam, channery fine sandy loam, channery silt loam.	SM, SC, ML, CL	A-4, A-6	5-15	70-95	55-91	40-91	35-65	25-40	NP-11
	35-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Stecoah---------	0-5	Channery fine sandy loam.	SM, ML, GM, MH	A-4, A-5	5-15	70-96	55-92	40-83	36-65	30-55	NP-7
	5-22	Channery loam, channery fine sandy loam, loam.	SM, SC, ML, CL	A-4, A-6	0-15	70-100	55-100	40-94	36-77	25-40	NP-12
	22-45	Channery loam, channery fine sandy loam, loam.	SM, SC, ML, CL	A-4	5-15	70-100	55-100	40-91	35-69	24-40	NP-10
	45-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
SrD*, SrE*: Spivey----------	0-13	Flaggy loam------	SM, GM, ML	A-4, A-5	15-30	70-95	65-85	40-80	36-65	15-45	NP-10
	13-60	Flaggy loam, very flaggy loam, very flaggy fine sandy loam.	SM, GM	A-1, A-2, A-4	20-60	55-85	40-75	30-60	20-50	25-40	NP-10
Santeetlah------	0-12	Flaggy loam------	SM, ML, GM, MH	A-4, A-5	15-25	70-95	65-85	40-80	36-65	30-74	NP-7
	12-28	Loam, fine sandy loam, silt loam.	SM, ML	A-4, A-6, A-7-6	0-5	85-100	80-100	65-90	36-75	25-41	NP-11
	28-60	Channery loam, channery fine sandy loam, channery silt loam.	SM, ML, GM	A-4	5-15	70-95	55-90	40-80	36-65	25-40	NP-10

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>3 inches	4	10	40	200		
	In				Pct					Pct	
SvB---------- Statler	0-9	Loam----------	ML, CL-ML, CL	A-4, A-6	0	95-100	75-100	70-100	53-75	25-37	3-14
	9-30	Clay loam, silt loam, loam.	CL, CL-ML	A-4, A-6	0	95-100	75-100	70-100	60-80	25-52	5-27
	30-62	Loam, clay loam, sandy clay loam.	CL, CL-ML, ML	A-4, A-6, A-7	0-5	95-100	75-100	65-98	50-75	25-52	5-27
	62-85	Loam, fine sandy loam, clay loam.	CL-ML, CL, SC-SM, SC	A-4	0-10	90-100	65-100	55-95	40-75	25-40	4-27
SyA*:											
Sylva----------	0-8	Loam----------	SM, ML	A-2, A-4, A-5	0-5	90-100	80-100	50-90	25-55	30-50	NP-10
	8-37	Fine sandy loam, sandy loam, loam.	SM, ML, SC-SM, CL-ML	A-2, A-4	0-5	90-100	80-100	50-90	25-55	25-40	NP-10
	37-65	Fine sandy loam, sandy loam, loam.	SM, ML, SC-SM, CL-ML	A-2, A-4	0-5	90-100	80-100	50-90	23-55	25-40	NP-10
Whiteside-------	0-14	Fine sandy loam	SM, ML	A-2, A-4, A-5	0-5	90-100	80-100	50-87	25-55	30-50	NP-10
	14-47	Sandy clay loam, loam, fine sandy loam.	SM, ML, SC	A-2, A-4, A-6, A-5	0-5	90-100	80-100	50-90	30-56	30-50	4-15
	47-53	Loamy sand, loamy fine sand, sandy loam.	SM, SP-SM	A-2-4, A-1-b	0-5	88-100	80-100	40-75	10-35	22-30	NP-4
	53-70	Sandy clay loam, fine sandy loam, sandy loam.	ML, SM, CL-ML, SC-SM	A-2-4, A-4	0-5	90-100	80-100	50-85	25-60	25-40	NP-10
TaC*, TaD*, TaE*:											
Tanasee----------	0-7	Sandy loam-------	SM, ML, MH	A-2-4, A-4, A-5	0-5	90-100	80-95	50-85	25-60	30-60	NP-7
	7-13	Gravelly sandy loam, sandy loam, loam.	SM, ML	A-2-4, A-4, A-1, A-5	0-15	70-100	60-95	30-85	20-60	30-50	NP-7
	13-31	Gravelly sandy loam, sandy loam, loam.	SM, SC-SM, ML, CL-ML	A-2-4, A-4, A-1, A-5	0-15	70-100	60-95	30-85	20-60	25-50	NP-7
	31-65	Gravelly loamy sand, cobbly loamy coarse sand, very stony sandy loam.	SM, SP-SM, SC-SM	A-2-4, A-1-b	0-50	70-85	60-75	20-50	10-30	20-40	NP-7

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>3 inches	4	10	40	200		
	In				Pct					Pct	
TaC*, TaD*, TaE*:											
Balsam	0-13	Stony sandy loam	SM	A-1-b, A-2-5, A-5	15-37	75-91	70-85	30-75	20-49	41-70	NP-7
	13-22	Very cobbly sandy loam, very stony sandy loam, very cobbly loam.	GM, SM	A-1-b, A-2-4	30-60	51-85	45-75	34-60	15-35	<40	NP-7
	22-48	Very cobbly fine sandy loam, very stony loam, very stony fine sandy loam.	GM, SM	A-1-b, A-2-4	30-60	51-85	45-75	34-60	15-35	<40	NP-7
	48-65	Very cobbly sandy loam, very stony coarse sandy loam, very stony loam.	GP-GM, GM, SP-SM, SM	A-1, A-3, A-2-4	30-60	33-85	23-75	14-60	5-25	<40	NP-7
TrE, TrF	0-10	Gravelly loam	SM, ML	A-2-4, A-4, A-1, A-5	5-15	70-85	60-75	30-65	20-55	30-51	NP-10
Trimont	10-40	Clay loam, sandy clay loam, loam.	SC, CL, ML, SM	A-4, A-6, A-7	0-5	90-100	85-100	75-90	35-65	25-51	6-18
	40-65	Gravelly sandy loam, loam, sandy loam.	SM, ML, CL, SC	A-2-4, A-4, A-1, A-5	0-15	70-100	60-100	30-85	20-65	25-50	NP-16
TwC*:											
Tuckasegee	0-11	Gravelly loam	SM	A-2, A-4, A-5, A-1-b	5-15	70-85	60-75	30-65	20-50	19-50	NP-10
	11-60	Gravelly fine sandy loam, loam, sandy loam, gravelly loam, gravelly sandy clay loam.	SM, ML, GM	A-4	2-15	70-100	65-100	55-95	36-65	<40	NP-10
Whiteside	0-14	Fine sandy loam	SM, ML	A-2, A-4, A-5	0-5	90-100	80-100	50-87	25-55	30-50	NP-10
	14-47	Sandy clay loam, loam, fine sandy loam.	SM, ML, SC	A-2, A-4, A-6, A-5	0-5	90-100	80-100	50-90	30-56	30-50	4-15
	47-53	Loamy sand, loamy fine sand, sandy loam.	SM, SP-SM	A-2-4, A-1-b	0-5	88-100	80-100	40-75	10-35	22-30	NP-4
	53-70	Sandy clay loam, fine sandy loam, sandy loam.	ML, SM, CL-ML, SC-SM	A-2-4, A-4	0-5	90-100	80-100	50-85	25-60	25-40	NP-10
Ud.											
Udorthents, loamy											
UfB*:											
Udorthents.											
Urban land.											

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>3 inches	4	10	40	200		
	In				Pct					Pct	
WaD, WaE, WaF, WeC, WeD, WeE, WeF---------- Wayah	0-14	Sandy loam-------	SM, ML	A-2, A-4, A-5	0-5	90-100	80-98	50-88	25-65	30-50	NP-10
	14-40	Gravelly loam, sandy loam, gravelly sandy loam.	SM, SC-SM, GM, ML	A-2-4, A-4, A-1-b	3-15	53-99	50-97	30-87	20-55	25-35	NP-10
	40-65	Gravelly fine sandy loam, gravelly sandy loam, gravelly loamy sand.	SM, SP-SM, GM, GP-GM	A-2-4, A-1-b, A-4	3-15	53-87	50-80	20-50	10-30	20-35	NP-4
WtB*: Whiteside-------	0-14	Fine sandy loam	SM, ML	A-2, A-4, A-5	0-5	90-100	80-100	50-87	25-55	30-50	NP-10
	14-47	Sandy clay loam, loam, fine sandy loam.	SM, ML, SC	A-2, A-4, A-6, A-5	0-5	90-100	80-100	50-90	30-56	30-50	4-15
	47-53	Loamy sand, loamy fine sand, sandy loam.	SM, SP-SM	A-2-4, A-1-b	0-5	88-100	80-100	40-75	10-35	22-30	NP-4
	53-70	Sandy clay loam, fine sandy loam, sandy loam.	ML, SM, CL-ML, SC-SM	A-2-4, A-4	0-5	90-100	80-100	50-85	25-60	25-40	NP-10
Tuckasegee------	0-11	Gravelly loam----	SM	A-2, A-4, A-5, A-1-b	5-15	70-85	60-75	30-65	20-50	19-50	NP-10
	11-60	Gravelly fine sandy loam, loam, sandy loam, gravelly loam, gravelly sandy clay loam.	SM, ML, GM	A-4	2-15	70-100	65-100	55-95	36-65	<40	NP-10

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

(The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated)

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
BaA----------	0-10	0-9	1.20-1.65	6.0-20	0.07-0.11	5.1-7.8	Low----------	0.10	5	2	.5-3
Biltmore	10-60	0-12	1.20-1.70	6.0-20	0.06-0.10	5.1-7.8	Low----------	0.10			
BkB2, BkC2, BkD2-	0-8	27-40	1.20-1.50	0.6-2.0	0.14-0.19	3.6-5.5	Low----------	0.32	3	8	.5-1
Braddock	8-60	35-55	1.20-1.50	0.6-2.0	0.12-0.17	3.6-5.5	Moderate-----	0.24			
BrC*:											
Braddock--------	0-8	27-40	1.20-1.50	0.6-2.0	0.14-0.19	3.6-5.5	Low----------	0.32	3	8	.5-1
	8-60	35-55	1.20-1.50	0.6-2.0	0.12-0.17	3.6-5.5	Moderate-----	0.24			
Urban land.											
BuD*:											
Burton----------	0-12	5-18	1.10-1.30	2.0-6.0	0.11-0.16	3.6-6.0	Low----------	0.15	2	8	8-20
	12-22	5-18	1.45-1.65	2.0-6.0	0.07-0.12	3.6-6.0	Low----------	0.15			
	22-36	---	---	---	---	---	----------	----			
Craggey---------	0-16	8-20	1.10-1.30	2.0-6.0	0.10-0.15	3.6-6.0	Low----------	0.15	1	8	8-20
	16	---	---	---	---	---	----------	----			
Rock outcrop.											
BuF*:											
Burton----------	0-12	5-18	1.10-1.30	2.0-6.0	0.11-0.16	3.6-6.0	Low----------	0.15	2	8	8-20
	12-22	5-18	1.45-1.65	2.0-6.0	0.07-0.12	3.6-6.0	Low----------	0.15			
	22-36	---	---	---	---	---	----------	----			
Craggey---------	0-16	8-20	1.10-1.30	2.0-6.0	0.10-0.15	3.6-6.0	Low----------	0.15	1	8	8-20
	16	---	---	---	---	---	----------	----			
Rock outcrop.											
CaC, CaD, CaE,											
CaF----------	0-9	5-18	1.30-1.50	2.0-6.0	0.11-0.15	4.5-6.0	Low----------	0.28	4	3	5-10
Cashiers	9-48	5-18	1.30-1.50	2.0-6.0	0.13-0.18	4.5-6.0	Low----------	0.32			
	48-65	5-18	1.30-1.50	2.0-6.0	0.10-0.14	4.5-6.0	Low----------	0.32			
CdC, CdD, CdE,											
CdF, CeC, CeD,											
CeE, CeF--------	0-7	5-18	1.30-1.50	2.0-6.0	0.10-0.14	4.5-6.0	Low----------	0.28	3	3	1-8
Chandler	7-99	5-18	1.30-1.50	2.0-6.0	0.11-0.15	4.5-6.0	Low----------	0.32			
ChE, ChF----------	0-15	5-18	1.35-1.60	2.0-6.0	0.12-0.18	3.6-5.5	Low----------	0.15	3	5	5-10
Cheoah	15-56	5-18	1.35-1.60	2.0-6.0	0.11-0.17	3.6-6.0	Low----------	0.20			
	56-60	---	---	---	---	---	----------	----			
CnC*, CnD*, CnE*:											
Chestnut--------	0-3	5-20	1.35-1.60	2.0-6.0	0.08-0.12	3.6-6.0	Low----------	0.17	2	5	1-8
	3-28	5-25	1.35-1.60	2.0-6.0	0.08-0.12	3.6-6.0	Low----------	0.15			
	28-60	---	---	---	---	---	----------	----			
Edneyville------	0-5	5-18	1.40-1.60	2.0-6.0	0.08-0.13	4.5-6.0	Low----------	0.17	4	5	1-8
	5-37	7-20	1.40-1.60	2.0-6.0	0.10-0.16	4.5-6.0	Low----------	0.20			
	37-60	5-20	1.40-1.60	2.0-6.0	0.08-0.14	4.5-6.0	Low----------	0.20			

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
CpD*, CpE*, CpF*:											
Cleveland	0-5	6-20	1.20-1.50	2.0-6.0	0.08-0.12	4.5-6.0	Low	0.24	1	3	.5-8
	5-17	6-20	1.20-1.50	2.0-6.0	0.08-0.12	4.5-6.0	Low	0.24			
	17	---	---	---	---	---	---	----			
Chestnut	0-3	5-20	1.35-1.60	2.0-6.0	0.08-0.12	3.6-6.0	Low	0.17	2	5	1-8
	3-28	5-25	1.35-1.60	2.0-6.0	0.08-0.12	3.6-6.0	Low	0.15			
	28-60	---	---	---	---	---	---	----			
Rock outcrop.											
CrD*:											
Cowee	0-5	8-20	1.25-1.60	2.0-6.0	0.10-0.15	3.6-6.0	Low	0.20	2	5	1-5
	5-27	18-35	1.30-1.60	0.6-2.0	0.12-0.18	3.6-6.0	Low	0.24			
	27-60	---	---	---	---	---	---	----			
Evard	0-6	5-20	1.20-1.50	2.0-6.0	0.08-0.14	4.5-6.0	Low	0.15	5	8	1-5
	6-27	18-35	1.30-1.50	0.6-2.0	0.15-0.18	4.5-6.0	Low	0.24			
	27-35	12-20	1.20-1.40	0.6-2.0	0.08-0.18	4.5-6.0	Low	0.24			
	35-60	5-20	1.20-1.40	0.6-2.0	0.05-0.17	4.5-6.0	Low	0.24			
Urban land.											
CsD, CsE	0-13	5-20	0.50-1.20	2.0-6.0	0.09-0.12	4.5-6.0	Low	0.05	5	8	5-18
Cullasaja	13-60	5-20	1.00-1.60	2.0-6.0	0.07-0.10	4.5-6.0	Low	0.05			
CuC*, CuD*, CuE*, CuF*:											
Cullasaja	0-13	5-20	0.50-1.20	2.0-6.0	0.09-0.12	4.5-6.5	Low	0.05	5	8	5-18
	13-60	5-20	1.00-1.60	2.0-6.0	0.07-0.10	4.5-6.0	Low	0.05			
Tuckasegee	0-11	12-27	0.85-1.20	2.0-6.0	0.12-0.17	4.5-6.5	Low	0.20	5	5	4-15
	11-60	12-27	1.00-1.40	2.0-6.0	0.11-0.21	4.5-6.0	Low	0.20			
CwA	0-13	5-18	1.30-1.50	2.0-6.0	0.12-0.18	4.5-6.5	Low	0.20	3	3	3-10
Cullowhee	13-23	2-8	1.35-1.55	>6.0	0.05-0.08	4.5-6.5	Low	0.10			
	23-35	5-12	1.35-1.55	>6.0	0.05-0.10	4.5-6.5	Low	0.10			
	35-65	1-5	1.40-1.60	>6.0	0.02-0.05	4.5-6.5	Low	0.05			
DfA	0-16	5-15	1.30-1.50	2.0-6.0	0.08-0.12	4.5-7.3	Low	0.10	2	3	3-8
Dellwood	16-60	1-8	1.40-1.60	>6.0	0.02-0.05	4.5-7.3	Low	0.05			
DrB	0-9	10-25	1.20-1.50	0.6-2.0	0.15-0.20	5.1-6.0	Low	0.32	4	5	.5-5
Dillard	9-70	18-35	1.40-1.60	0.6-2.0	0.12-0.16	4.5-5.5	Low	0.28			
DsB, DsC	0-10	10-27	1.00-1.70	2.0-6.0	0.11-0.20	4.5-7.3	Low	0.20	5	3	2-8
Dillsboro	10-43	35-60	1.20-1.60	0.6-2.0	0.17-0.19	4.5-7.3	Moderate	0.28			
	43-59	35-60	1.20-1.60	0.6-2.0	0.08-0.14	4.5-6.0	Moderate	0.10			
	59-75	20-35	1.20-1.60	0.6-2.0	0.08-0.14	4.5-6.0	Low	0.10			
EdC*, EdD*, EdE*, EdF*:											
Edneyville	0-5	5-18	1.40-1.60	2.0-6.0	0.08-0.13	4.5-6.0	Low	0.17	4	5	1-8
	5-37	7-20	1.40-1.60	2.0-6.0	0.10-0.16	4.5-6.0	Low	0.20			
	37-60	5-20	1.40-1.60	2.0-6.0	0.08-0.14	4.5-6.0	Low	0.20			
Chestnut	0-3	5-20	1.35-1.60	2.0-6.0	0.08-0.12	3.6-6.0	Low	0.17	2	5	1-8
	3-28	5-25	1.35-1.60	2.0-6.0	0.08-0.12	3.6-6.0	Low	0.15			
	28-60	---	---	---	---	---	---	----			

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
EgB2, EgC2, EgD2-Ellijay	0-4	27-40	1.00-1.30	0.6-2.0	0.15-0.20	4.5-7.3	Low	0.28	3	6	1-5
	4-34	35-60	1.00-1.30	0.6-2.0	0.15-0.20	5.1-7.3	Moderate	0.28			
	34-52	20-35	1.00-1.30	0.6-2.0	0.15-0.20	5.1-7.3	Low	0.28			
	52-70	8-30	1.00-1.30	0.6-2.0	0.10-0.15	5.1-7.3	Low	0.28			
EvC*, EvD*, EvE*, EvF*:											
Evard	0-6	5-20	1.20-1.50	2.0-6.0	0.08-0.14	4.5-6.0	Low	0.15	5	8	1-5
	6-27	18-35	1.30-1.50	0.6-2.0	0.15-0.18	4.5-6.0	Low	0.24			
	27-35	12-20	1.20-1.40	0.6-2.0	0.08-0.18	4.5-6.0	Low	0.24			
	35-60	5-20	1.20-1.40	0.6-2.0	0.05-0.17	4.5-6.0	Low	0.24			
Cowee	0-5	8-20	1.25-1.60	2.0-6.0	0.10-0.15	3.6-6.0	Low	0.20	2	5	1-5
	5-27	18-35	1.30-1.60	0.6-2.0	0.12-0.18	3.6-6.0	Low	0.24			
	27-60	---	---	---	---	---	---	---			
FaC, FaD, FaE, FaF	0-6	5-25	1.30-1.50	2.0-6.0	0.12-0.18	4.5-6.5	Low	0.32	3	5	1-5
Fannin	6-24	18-35	1.30-1.50	0.6-2.0	0.11-0.17	4.5-6.5	Low	0.24			
	24-60	5-25	1.30-1.50	0.6-2.0	0.08-0.12	4.5-6.5	Low	0.24			
HpA	0-13	27-40	1.20-1.45	0.2-0.6	0.16-0.22	4.5-7.3	Moderate	0.28	5	6	3-10
Hemphill	13-38	35-60	1.20-1.45	0.06-0.2	0.15-0.20	4.5-7.3	High	0.28			
	38-64	8-35	1.20-1.45	0.2-0.6	0.12-0.20	4.5-7.3	Low	0.24			
	64-80	---	---	---	---	---	---	---			
JbD*, JbE*:											
Junaluska	0-3	5-18	1.35-1.60	2.0-6.0	0.10-0.15	3.6-6.0	Low	0.15	2	5	1-5
	3-28	18-35	1.30-1.65	0.6-2.0	0.12-0.18	3.6-6.0	Low	0.15			
	28-60	---	---	---	---	---	---	---			
Brasstown	0-4	5-18	1.00-1.40	2.0-6.0	0.10-0.15	3.6-6.0	Low	0.15	3	5	1-5
	4-45	18-35	1.35-1.60	0.6-2.0	0.12-0.18	3.6-6.0	Low	0.15			
	45-50	8-20	1.40-1.65	0.6-2.0	0.10-0.15	3.6-6.0	Low	0.15			
	50-60	---	---	---	---	---	---	---			
JtD*, JtE*, JtF*:											
Junaluska	0-3	5-18	1.35-1.60	2.0-6.0	0.10-0.15	3.6-6.0	Low	0.15	2	5	1-5
	3-28	18-35	1.30-1.65	0.6-2.0	0.12-0.18	3.6-6.0	Low	0.15			
	28-60	---	---	---	---	---	---	---			
Tsali	0-6	5-20	1.35-1.60	2.0-6.0	0.10-0.15	3.6-6.0	Low	0.15	1	5	1-5
	6-16	18-35	1.30-1.50	0.6-2.0	0.12-0.18	3.6-6.0	Low	0.15			
	16-40	---	---	---	---	---	---	---			
NkA	0-26	5-18	1.30-1.50	2.0-6.0	0.13-0.20	4.5-6.5	Low	0.20	3	3	5-12
Nikwasi	26-60	1-5	1.40-1.60	>6.0	0.02-0.05	4.5-6.5	Low	0.05			
OcD, OcE, OcF, OwD, OwE, OwF	0-8	5-18	1.00-1.30	2.0-6.0	0.13-0.18	3.6-5.5	Low	0.15	3	5	8-20
Oconaluftee	8-19	5-18	1.20-1.50	2.0-6.0	0.12-0.18	3.6-5.5	Low	0.15			
	19-35	5-18	1.20-1.50	2.0-6.0	0.11-0.17	3.6-6.0	Low	0.20			
	35-67	5-18	1.35-1.60	2.0-6.0	0.11-0.17	3.6-6.0	Low	0.20			
Pt*.											
Pits, quarries											
PwD, PwE, PwF	0-8	4-18	1.00-1.20	2.0-6.0	0.18-0.28	3.6-6.0	Low	0.24	4	5	5-15
Plott	8-18	5-20	1.20-1.40	2.0-6.0	0.14-0.24	4.5-6.0	Low	0.24			
	18-60	2-18	1.20-1.60	2.0-6.0	0.05-0.20	4.5-6.0	Low	0.15			

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
RdA----------	0-14	5-18	1.30-1.50	2.0-6.0	0.10-0.18	4.5-7.3	Low----------	0.20	3	3	3-8
Reddies	14-26	5-18	1.35-1.55	2.0-6.0	0.08-0.15	4.5-7.3	Low----------	0.10			
	26-60	1-5	1.40-1.60	>6.0	0.02-0.05	4.5-7.3	Low----------	0.05			
RkF*:											
Rock outcrop.											
Cleveland-------	0-5	6-20	1.20-1.50	2.0-6.0	0.08-0.12	4.5-6.0	Low----------	0.24	1	3	.5-8
	5-17	6-20	1.20-1.50	2.0-6.0	0.08-0.12	4.5-6.0	Low----------	0.24			
	17	---	---	---	---	---	----------	----			
RoA----------	0-13	8-18	1.25-1.40	2.0-6.0	0.12-0.18	5.1-6.5	Low----------	0.24	5	3	2-8
Rosman	13-73	8-18	1.25-1.50	2.0-6.0	0.10-0.18	5.1-6.5	Low----------	0.24			
SaB, SaC, SaD,											
SbD----------	0-9	7-20	1.35-1.60	2.0-6.0	0.10-0.15	3.6-6.0	Low----------	0.15	5	5	3-10
Saunook	9-24	18-35	1.30-1.50	0.6-2.0	0.09-0.15	4.5-6.5	Low----------	0.15			
	24-60	7-20	1.35-1.60	2.0-6.0	0.07-0.12	4.5-6.5	Low----------	0.15			
SoD*, SoE*, SoF*:											
Soco----------	0-4	5-18	1.35-1.60	2.0-6.0	0.11-0.17	3.6-5.5	Low----------	0.15	2	5	1-8
	4-24	5-18	1.35-1.60	2.0-6.0	0.12-0.20	3.6-5.5	Low----------	0.32			
	24-35	5-18	1.40-1.65	2.0-6.0	0.09-0.15	3.6-5.5	Low----------	0.15			
	35-60	---	---	---	---	---	----------	----			
Stecoah---------	0-5	5-18	1.35-1.60	2.0-6.0	0.11-0.17	3.6-5.5	Low----------	0.15	3	5	1-8
	5-22	5-18	1.35-1.60	2.0-6.0	0.10-0.17	3.6-5.5	Low----------	0.32			
	22-45	5-18	1.40-1.65	2.0-6.0	0.10-0.15	3.6-5.5	Low----------	0.15			
	45-60	---	---	---	---	---	----------	----			
SrD*, SrE*:											
Spivey----------	0-13	5-20	1.20-1.40	0.6-6.0	0.10-0.16	3.6-6.0	Low----------	0.17	5	8	5-18
	13-60	5-20	1.30-1.50	0.6-6.0	0.07-0.11	3.6-6.0	Low----------	0.05			
Santeetlah------	0-12	5-18	1.20-1.40	2.0-6.0	0.12-0.18	3.6-6.0	Low----------	0.15	5	8	5-10
	12-28	5-18	1.30-1.50	2.0-6.0	0.14-0.22	3.6-6.0	Low----------	0.32			
	28-60	5-18	1.35-1.55	2.0-6.0	0.11-0.17	3.6-6.0	Low----------	0.20			
SvB----------	0-9	10-20	1.35-1.45	0.6-2.0	0.18-0.22	5.1-7.3	Low----------	0.32	5	5	2-6
Statler	9-30	18-35	1.35-1.50	0.6-2.0	0.17-0.20	5.1-6.5	Low----------	0.24			
	30-62	15-35	1.35-1.50	0.6-2.0	0.17-0.20	5.1-6.0	Low----------	0.24			
	62-85	12-30	1.35-1.50	0.6-6.0	0.14-0.18	5.1-6.0	Low----------	0.24			
SyA*:											
Sylva----------	0-8	5-18	1.30-1.50	2.0-6.0	0.16-0.24	3.6-5.5	Low----------	0.24	5	5	4-10
	8-37	5-18	1.35-1.55	2.0-6.0	0.14-0.20	3.6-5.5	Low----------	0.24			
	37-65	5-27	1.35-1.55	0.6-6.0	0.14-0.20	3.6-5.5	Low----------	0.24			
Whiteside-------	0-14	5-18	1.30-1.50	2.0-6.0	0.15-0.22	4.5-7.3	Low----------	0.24	5	5	2-8
	14-47	18-27	1.35-1.55	0.6-2.0	0.14-0.20	4.5-6.0	Low----------	0.24			
	47-53	3-10	1.40-1.60	2.0-6.0	0.04-0.11	4.5-6.0	Low----------	0.15			
	53-70	8-35	1.35-1.60	0.6-6.0	0.10-0.16	4.5-6.0	Low----------	0.24			
TaC*, TaD*, TaE*:											
Tanasee---------	0-7	5-18	1.10-1.30	2.0-6.0	0.16-0.22	3.6-5.5	Low----------	0.24	5	3	8-20
	7-13	5-18	1.35-1.60	2.0-6.0	0.12-0.18	3.6-5.5	Low----------	0.20			
	13-31	5-18	1.35-1.60	2.0-6.0	0.10-0.16	4.5-5.5	Low----------	0.15			
	31-65	1-6	1.40-1.65	2.0-6.0	0.05-0.09	4.5-5.5	Low----------	0.10			

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	g/cc	In/hr	In/in	pH					Pct
TaC*, TaD*, TaE*:											
Balsam	0-13	4-20	0.50-1.00	2.0-6.0	0.20-0.25	3.6-6.0	Low	0.10	5	8	8-20
	13-22	4-18	1.00-1.50	2.0-6.0	0.06-0.10	3.6-6.0	Low	0.05			
	22-48	4-18	1.00-1.50	2.0-6.0	0.06-0.10	3.6-6.0	Low	0.05			
	48-65	2-15	1.20-1.60	2.0-6.0	0.04-0.09	3.6-6.0	Low	0.05			
TrE, TrF	0-10	8-20	1.35-1.60	2.0-6.0	0.10-0.15	4.5-6.0	Low	0.15	4	5	3-9
Trimont	10-40	18-35	1.30-1.50	0.6-2.0	0.12-0.20	4.5-6.0	Low	0.24			
	40-65	8-20	1.40-1.65	0.6-2.0	0.10-0.15	4.5-6.0	Low	0.15			
TwC*:											
Tuckasegee	0-11	12-27	0.85-1.20	2.0-6.0	0.12-0.17	4.5-6.5	Low	0.20	5	5	4-15
	11-60	12-27	1.00-1.40	2.0-6.0	0.11-0.21	4.5-6.0	Low	0.20			
Whiteside	0-14	5-18	1.30-1.50	2.0-6.0	0.15-0.22	4.5-7.3	Low	0.24	5	5	2-8
	14-47	18-27	1.35-1.55	0.6-2.0	0.14-0.20	4.5-6.0	Low	0.24			
	47-53	3-10	1.40-1.60	2.0-6.0	0.04-0.11	4.5-6.0	Low	0.15			
	53-70	8-35	1.35-1.60	0.6-6.0	0.10-0.16	4.5-6.0	Low	0.24			
Ud.											
Udorthents, loamy											
UfB*:											
Udorthents.											
Urban land.											
WaD, WaE, WaF, WeC, WeD, WeE, WeF	0-14	5-18	1.00-1.20	2.0-6.0	0.16-0.22	3.6-5.5	Low	0.24	3	5	8-20
Wayah	14-40	5-18	1.20-1.60	2.0-6.0	0.09-0.13	4.5-6.0	Low	0.15			
	40-65	3-15	1.40-1.65	2.0-6.0	0.05-0.09	4.5-6.0	Low	0.10			
WtB*:											
Whiteside	0-14	5-18	1.30-1.50	2.0-6.0	0.15-0.22	4.5-7.3	Low	0.24	5	5	2-8
	14-47	18-27	1.35-1.55	0.6-2.0	0.14-0.20	4.5-6.0	Low	0.24			
	47-53	3-10	1.40-1.60	2.0-6.0	0.04-0.11	4.5-6.0	Low	0.15			
	53-70	8-35	1.35-1.60	0.6-6.0	0.10-0.16	4.5-6.0	Low	0.24			
Tuckasegee	0-11	12-27	0.85-1.20	2.0-6.0	0.12-0.17	4.5-6.5	Low	0.20	5	5	4-15
	11-60	12-27	1.00-1.40	2.0-6.0	0.11-0.21	4.5-6.0	Low	0.20			

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--SOIL AND WATER FEATURES

("Flooding" and "water table" and terms such as "rare," "brief," and "apparent" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
BaA--- Biltmore	A	Frequent	Brief	Jan-Dec	3.5-6.0	Apparent	Dec-May	>60	---	Low	Low	Moderate.
BkB2, BkC2, BkD2--- Braddock	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Moderate.
BrC*:												
Braddock	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Moderate.
Urban land.												
BuD*, BuF*:												
Burton	B	None	---	---	>6.0	---	---	20-40	Hard	Moderate	High	High.
Craggey	D	None	---	---	>6.0	---	---	10-20	Hard	Moderate	High	High.
Rock outcrop.												
CaC, CaD, CaE, CaF--- Cashiers	B	None	---	---	>6.0	---	---	>60	---	Moderate	Low	Moderate.
CdC, CdD, CdE, CdF, CeC, CeD, CeE, CeF--- Chandler	B	None	---	---	>6.0	---	---	>60	---	Moderate	Low	High.
ChE, ChF--- Cheoah	B	None	---	---	>6.0	---	---	40-60	Soft	Moderate	Low	High.
CnC*, CnD*, CnE*:												
Chestnut	B	None	---	---	>6.0	---	---	20-40	Soft	Moderate	Low	High.
Edneyville	B	None	---	---	>6.0	---	---	>60	---	Moderate	Low	High.
CpD*, CpE*, CpF*:												
Cleveland	C	None	---	---	>6.0	---	---	10-20	Hard	Moderate	Low	High.
Chestnut	B	None	---	---	>6.0	---	---	20-40	Soft	Moderate	Low	High.
Rock outcrop.												

See footnote at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
CrD*:												
Cowee	B	None	---	---	>6.0	---	---	20-40	Soft	Moderate	Moderate	High.
Evard	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate	High.
Urban land.												
CsD, CsE	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	High.
Cullasaja												
CuC*, CuD*, CuE*, CuF*:												
Cullasaja	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	High.
Tuckasegee	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	High.
CwA	B/D	Occasional	Very brief	Jan-Dec	1.5-2.0	Apparent	Nov-May	>60	---	Low	High	High.
Cullowhee												
DfA	A	Occasional	Very brief	Dec-Apr	2.0-4.0	Apparent	Jan-Apr	>60	---	Low	Low	Moderate.
Dellwood												
DrB	C	Rare	---	---	2.0-3.0	Apparent	Dec-Apr	>60	---	Moderate	Moderate	High.
Dillard												
DsB, DsC	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Moderate.
Dillsboro												
EdC*, EdD*, EdE*, EdF*:												
Edneyville	B	None	---	---	>6.0	---	---	>60	---	Moderate	Low	High.
Chestnut	B	None	---	---	>6.0	---	---	20-40	Soft	Moderate	Low	High.
EgB2, EgC2, EgD2	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	Moderate.
Ellijay												
EvC*, EvD*, EvE*, EvF*:												
Evard	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate	High.
Cowee	B	None	---	---	>6.0	---	---	20-40	Soft	Moderate	Moderate	High.
FaC, FaD, FaE, FaF	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate	Moderate.
Fannin												

See footnote at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
HpA---------- Hemphill	D	Rare--------	---	---	0-1.0	Apparent	Nov-May	>60	---	High-----	High-----	High.
JbD*, JbE*:												
Junaluska--------	B	None--------	---	---	>6.0	---	---	20-40	Soft	Moderate	Moderate	High.
Brasstown--------	B	None--------	---	---	>6.0	---	---	40-60	Soft	Moderate	Moderate	High.
JtD*, JtE*, JtF*:												
Junaluska--------	B	None--------	---	---	>6.0	---	---	20-40	Soft	Moderate	Moderate	High.
Tsali----------	C	None--------	---	---	>6.0	---	---	10-20	Soft	Moderate	Moderate	High.
NkA---------- Nikwasi	B/D	Frequent----	Very brief	Jan-Dec	0-1.0	Apparent	Nov-May	>60	---	Moderate	High-----	High.
OcD, OcE, OcF, OwD, OwE, OwF---- Oconaluftee	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low------	High.
Pt*. Pits, quarries												
PwD, PwE, PwF----- Plott	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low------	High.
RdA---------- Reddies	B	Occasional	Very brief	Jan-Dec	2.0-3.5	Apparent	Dec-Apr	>60	---	Low------	Low------	Moderate.
RkF*:												
Rock outcrop.												
Cleveland--------	C	None--------	---	---	>6.0	---	---	10-20	Hard	Moderate	Low------	High.
RoA---------- Rosman	B	Occasional	Very brief	Dec-Apr	2.5-5.0	Apparent	Jan-Apr	>60	---	Moderate	Moderate	Moderate.
SaB, SaC, SaD, SbD---------- Saunook	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low------	High.
SoD*, SoE*, SoF*:												
Soco----------	B	None--------	---	---	>6.0	---	---	20-40	Soft	Moderate	Moderate	High.
Stecoah----------	B	None--------	---	---	>6.0	---	---	40-60	Soft	Moderate	Moderate	High.
SrD*, SrE*:												
Spivey----------	B	None--------	---	---	>6.0	---	---	>60	---	Moderate	Low------	High.

See footnote at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Uncoated steel	Concrete
					Ft			In				
SrD*, SrE*: Santeetlah	B	None	---	---	>6.0	---	---	>60	---	Moderate	Low	High.
SvB--- Statler	B	Rare	---	---	>6.0	---	---	>60	---	Moderate	Low	Moderate.
SyA*: Sylva	B/D	None	---	---	0-1.0	Apparent	Nov-May	>60	---	High	High	High.
Whiteside	B	None	---	---	1.5-3.0	Apparent	Nov-May	>60	---	Moderate	Moderate	High.
TaC*, TaD*, TaE*: Tanasee	B	None	---	---	>6.0	---	---	>60	---	Moderate	Low	High.
Balsam	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	High.
TrE, TrF--- Trimont	B	None	---	---	>6.0	---	---	>60	---	Moderate	Low	High.
TwC*: Tuckasegee	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	High.
Whiteside	B	None	---	---	1.5-3.0	Apparent	Nov-May	>60	---	Moderate	Moderate	High.
Ud. Udorthents, loamy												
UfB*: Udorthents	---	Rare	---	---	---	---	---	---	---	---	---	---
Urban land.												
WaD, WaE, WaF, WeC, WeD, WeE, WeF--- Wayah	B	None	---	---	>6.0	---	---	>60	---	Moderate	Low	High.
WtB*: Whiteside	B	None	---	---	1.5-3.0	Apparent	Nov-May	>60	---	Moderate	Moderate	High.
Tuckasegee	B	None	---	---	>6.0	---	---	>60	---	Moderate	High	High.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--ENGINEERING INDEX TEST DATA

(Dashes indicate that data were not available. LL means liquid limit; PI, plasticity index; MD, maximum dry density; OM, optimum moisture; and NP, nonplastic. The soils are the typical pedons for the soil series in the survey area. For the location of the pedons see "Soil Series and Their Morphology")

Soil name, report number, horizon, and depth in inches	Classification		Grain-size distribution											LL	PI	Moisture density	
			Percentage passing sieve--								Percentage smaller than--					MD	OM
	AASHTO	Unified	3 in.	2 in.	3/4 inch	3/8 inch	No. 4	No. 10	No. 40	No. 200	.02 mm	.005 mm	.002 mm				
														Pct		Lb/cu ft	Pct
Biltmore sand: (S85NC-099-14)																	
Ap---------- 0-12	A-2-4(0)	SP, SM	---	---	---	---	---	100	88	12	7	4	4	26	NP	97	13
C1----------12-34	A-2-4(0)	SP, SM	---	---	---	---	---	100	86	12	7	4	4	30	NP	103	17
C2----------34-52	A-2-4(0)	SM	---	---	---	---	---	100	96	24	14	5	4	34	NP	98	20
Dillsboro loam: (S85NC-099-15)																	
Ap---------- 0-10	A-6(8)	ML, CL	---	---	---	---	100	99	93	66	53	34	27	33	15	106	21
Bt1----------10-23	A-7-6(10)	CL	---	---	100	99	98	95	89	66	52	43	37	42	18	11	19
Rosman fine sandy loam: (S85NC-099-12)																	
Ap---------- 0-15	A-4(4)	SM	---	---	---	---	---	100	99	55	28	15	9	40	NP	92	26
C----------15-60	A-4(5)	SM	---	---	---	---	---	---	100	59	31	15	9	38	NP	92	25
Wayah sandy loam: (S85NC-099-10)																	
A1---------- 0-5	A-5(2)	SM	---	---	99	96	96	94	83	44	26	9	6	48	NP	---	---
Bw----------14-30	A-2-4(0)	SM	---	---	96	95	94	91	82	35	23	15	11	32	NP	107	18
C----------30-45	A-2-4(0)	SM	---	---	98	98	98	96	87	29	15	11	9	32	NP	---	---
Whiteside fine sandy loam: (S85NC-099-8)																	
Ap---------- 0-14	A-4(2)	SM	---	---	100	99	98	95	81	44	34	18	11	36	8	108	20
Bt1----------14-24	A-6(3)	SC	---	---	---	---	100	96	80	46	39	26	21	33	12	112	21
Cg1----------47-53	A-2-4(0)	SM	---	---	100	99	97	95	73	28	21	16	14	26	NP	121	13

TABLE 18.--CLASSIFICATION OF THE SOILS

(An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series)

Soil name	Family or higher taxonomic class
Balsam	Loamy-skeletal, mixed, frigid Typic Haplumbrepts
Biltmore	Mixed, mesic Typic Udipsamments
Braddock	Clayey, mixed, mesic Typic Hapludults
Brasstown	Fine-loamy, mixed, mesic Typic Hapludults
Burton	Coarse-loamy, mixed, frigid Typic Haplumbrepts
Cashiers	Coarse-loamy, micaceous, mesic Umbric Dystrochrepts
Chandler	Coarse-loamy, micaceous, mesic Typic Dystrochrepts
Cheoah	Coarse-loamy, mixed, mesic Typic Haplumbrepts
Chestnut	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Cleveland	Loamy, mixed, mesic Lithic Dystrochrepts
Cowee	Fine-loamy, mixed, mesic Typic Hapludults
Craggey	Loamy, mixed, frigid Lithic Haplumbrepts
Cullasaja	Loamy-skeletal, mixed, mesic Typic Haplumbrepts
Cullowhee	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Aquic Haplumbrepts
Dellwood	Sandy-skeletal, mixed, mesic Fluventic Haplumbrepts
Dillard	Fine-loamy, mixed, mesic Aquic Hapludults
Dillsboro	Clayey, mixed, mesic Humic Hapludults
Edneyville	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Ellijay	Fine, mixed, mesic Rhodic Kanhapludalfs
Evard	Fine-loamy, oxidic, mesic Typic Hapludults
Fannin	Fine-loamy, micaceous, mesic Typic Hapludults
Hemphill	Fine, mixed, mesic Typic Umbraqualfs
Junaluska	Fine-loamy, mixed, mesic Typic Hapludults
Nikwasi	Coarse-loamy over sandy or sandy-skeletal, mixed, nonacid, mesic Cumulic Humaquepts
Oconaluftee	Coarse-loamy, mixed, frigid Typic Haplumbrepts
Plott	Coarse-loamy, mixed, mesic Typic Haplumbrepts
Reddies	Coarse-loamy over sandy or sandy-skeletal, mixed, mesic Fluventic Haplumbrepts
*Rosman	Coarse-loamy, mixed, mesic Fluventic Haplumbrepts
Santeetlah	Coarse-loamy, mixed, mesic Typic Haplumbrepts
Saunook	Fine-loamy, mixed, mesic Humic Hapludults
Soco	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Spivey	Loamy-skeletal, mixed, mesic Typic Haplumbrepts
Statler	Fine-loamy, mixed, mesic Humic Hapludults
Stecoah	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Sylva	Coarse-loamy, mixed, acid, mesic Humic Haplaquepts
Tanasee	Coarse-loamy, mixed, frigid Typic Haplumbrepts
Trimont	Fine-loamy, mixed, mesic Humic Hapludults
Tsali	Loamy, mixed, mesic, shallow Typic Hapludults
Tuckasegee	Fine-loamy, mixed, mesic Typic Haplumbrepts
Udorthents	Udorthents
Wayah	Coarse-loamy, mixed, frigid Typic Haplumbrepts
Whiteside	Fine-loamy, mixed, mesic Aquic Hapludults

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