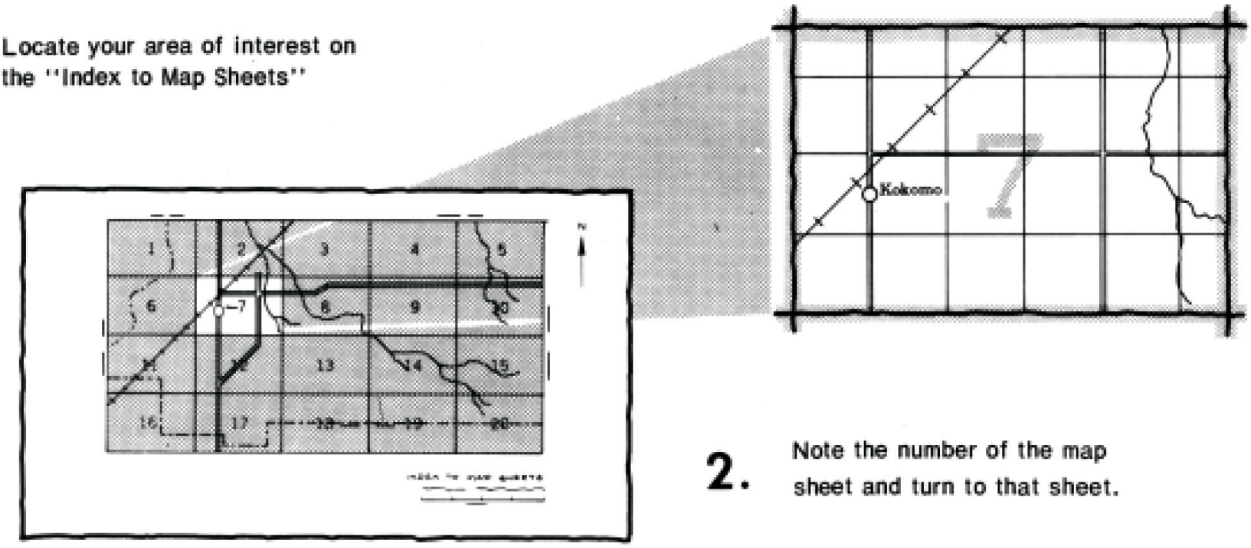
SOIL
SURVEY OF

Coweta, Heard, and Troup Counties, Georgia

U. S. Department of Agriculture
Soil Conservation Service
in cooperation with
University of Georgia, College of Agriculture
Agricultural Experiment Stations

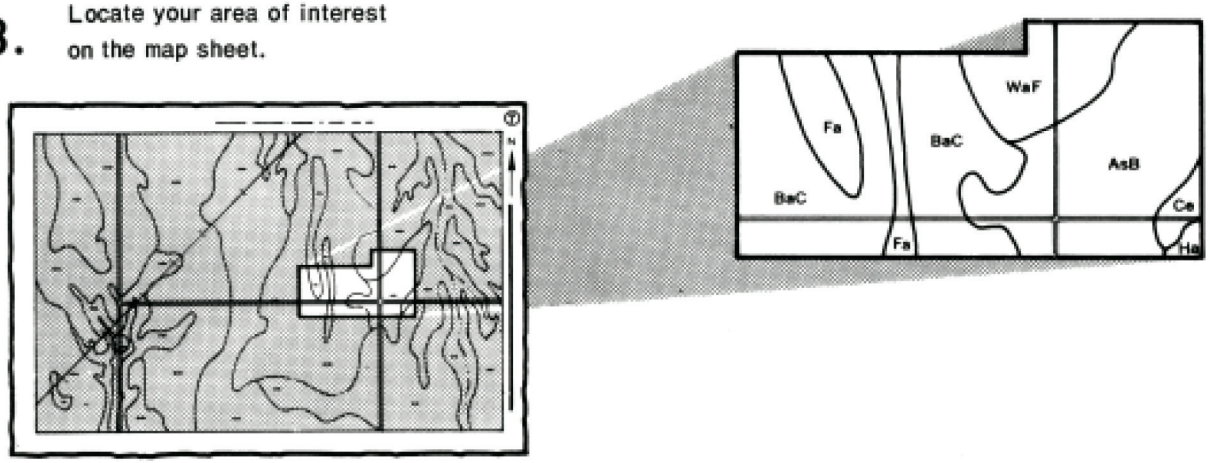
HOW TO USE

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

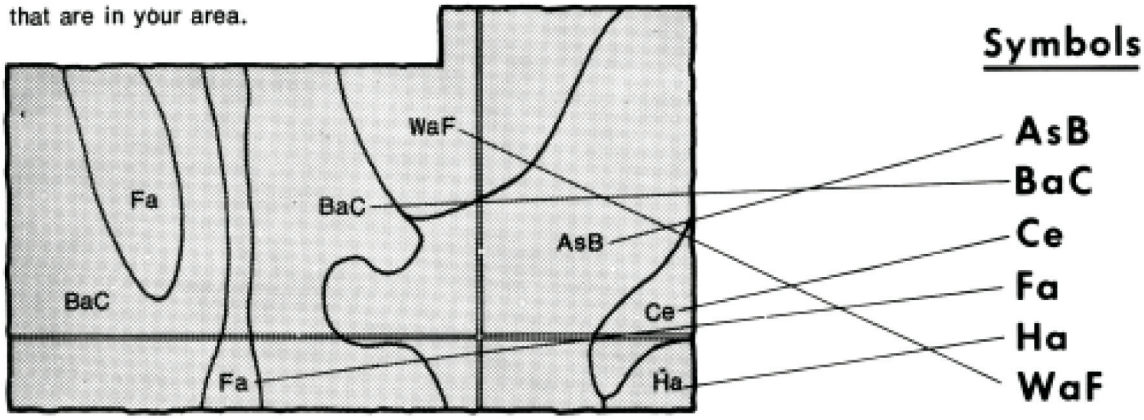


2. Note the number of the map sheet and turn to that sheet.

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

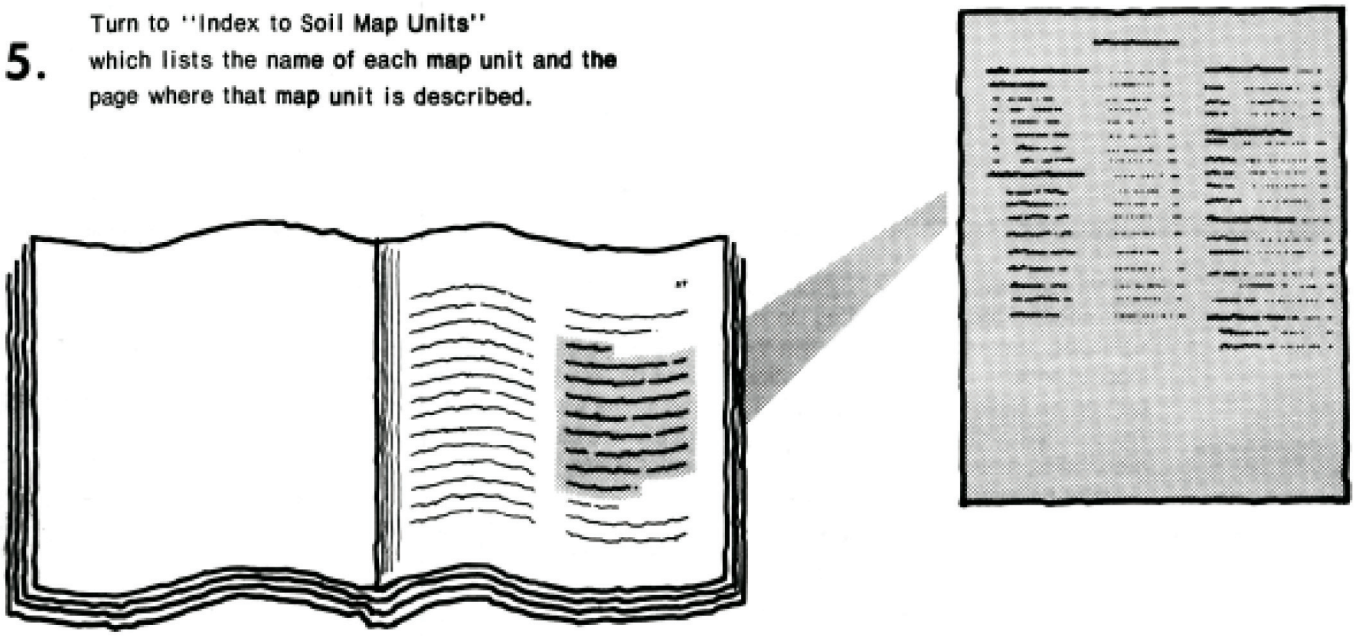


4. List the map unit symbols that are in your area.

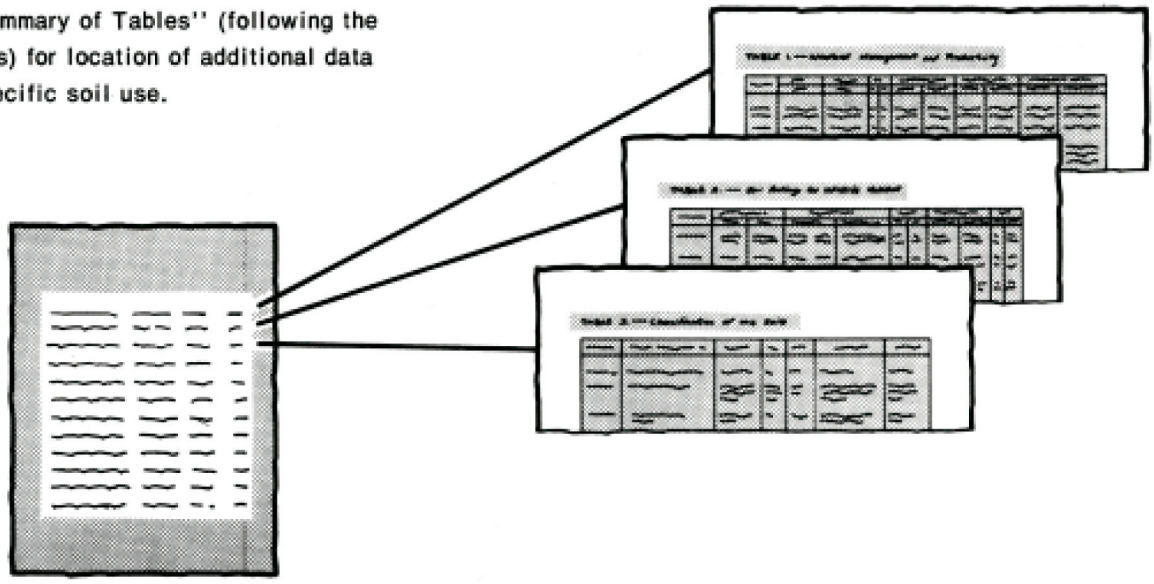


THIS SOIL SURVEY

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



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



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

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

Major fieldwork for this soil survey was completed in the period 1966-1976. Soil names and descriptions were approved in 1976. Unless otherwise indicated, statements in the publication refer to conditions in the survey area in 1976. This survey was made cooperatively by the Soil Conservation Service and the University of Georgia, College of Agriculture, Agricultural Experiment Stations. It is part of the technical assistance furnished to the Pine Mountain Soil and Water Conservation District and West Georgia Soil and Water Conservation District.

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

Cover: Multipurpose use of Pacolet sandy clay loam, 10 to 15 percent slopes, eroded. Home amidst woodland and grazingland overlooking water.

Contents

	Page
Index to map units	iv
Summary of tables	v
Foreword	vii
General nature of the counties	1
Climate	1
Organization, settlement, and population	2
Industry	2
Natural resources	2
Farming	2
How this survey was made	3
General soil maps for broad land use planning	3
Descriptions and potentials of map units in Coweta County	3
Nearly level soils that formed in alluvial sediment; on flood plains and low terraces	3
1. Riverview-Chewacla-Roanoke	4
2. Riverview	4
Very gently sloping to sloping soils that formed in material weathered from granite, gneiss, or mica schist; on uplands	4
3. Cecil-Madison-Appling	4
4. Appling-Helena	5
5. Cecil-Madison	5
Sloping to steep soils that formed in material weathered from granite, gneiss, or mica schist; on uplands	6
6. Pacolet-Wedowee	6
7. Madison-Pacolet	6
Descriptions and potentials of map units in Heard County	6
Nearly level soils that formed in alluvial sediment; on flood plains	6
1. Riverview-Chewacla	6
2. Riverview	7
Very gently sloping to sloping soils that formed in material weathered from granite, gneiss, or mica schist; on uplands	7
3. Madison	7
4. Cecil-Appling	8
5. Appling	8
6. Cecil-Madison-Appling	8
Sloping to steep soils that formed in material weathered from granite, gneiss, or mica schist; on uplands	9
7. Madison-Louisa	9
8. Pacolet-Wedowee	9
9. Pacolet-Madison	9
Descriptions and potentials of map units in Troup County	10
Nearly level soils that formed in alluvial sediment; on flood plains and low terraces	10
1. Riverview-Chewacla-Roanoke	10
2. Riverview	10
Very gently sloping to sloping soils that formed in material weathered from granite, gneiss, or mica schist; on uplands	11
3. Cecil-Appling-Davidson	11
4. Cecil-Madison-Gwinnett	11
Moderately steep soils that formed in material weathered from granite, gneiss, or mica schist; on uplands	12
5. Pacolet-Madison	12
Broad land use considerations	12
Soil maps for detailed planning	12
Soil descriptions and potentials	13
Use and management of the soils	30
Crops and pasture	30
Yields per acre	31
Capability classes and subclasses	32
Woodland management and productivity	32
Engineering	33
Building site development	34
Sanitary facilities	34
Construction materials	35
Water management	36
Recreation	37
Wildlife habitat	37
Soil properties	39
Engineering properties	39
Physical and chemical properties	40
Soil and water features	40
Engineering test data	41
Classification of the soils	41
Soil series and morphology	42
Altavista series	42
Appling series	43
Cecil series	43
Chewacla series	44
Davidson series	44
Gwinnett series	44
Helena series	45
Louisa series	45
Madison series	46
Musella series	46
Pacolet series	47
Riverview series	47
Roanoke series	48
Vance series	48
Wedowee series	49
Wickham series	49
Wilkes series	50
Formation	50
Parent material	50
Climate	51
Relief	51
Plants and animals	51
Time	51
References	52
Glossary	52
Illustrations	59
Tables	65

Issued September 1980

Index to Map Units

Page

AkB—Altavista fine sandy loam, 2 to 6 percent slopes ... 13
AmB—Appling sandy loam, 2 to 6 percent slopes ... 14
AmC—Appling sandy loam, 6 to 10 percent slopes ... 14
AmD—Appling sandy loam, 10 to 15 percent slopes. 14
AnC2—Appling sandy clay loam, 6 to 10 percent slopes, eroded ... 15
CeB—Cecil sandy loam, 2 to 6 percent slopes ... 15
CeC—Cecil sandy loam, 6 to 10 percent slopes ... 15
CeD—Cecil sandy loam, 10 to 15 percent slopes ... 16
CfC2—Cecil sandy clay loam, 6 to 10 percent slopes, eroded ... 16
CfD2—Cecil sandy clay loam, 10 to 15 percent slopes, eroded ... 17
CuC—Cecil-Urban land complex, 2 to 10 percent slopes ... 17
CuE—Cecil-Urban land complex, 10 to 25 percent slopes ... 17
DgB—Davidson loam, 2 to 6 percent slopes ... 18
GwC2—Gwinnett sandy clay loam, 6 to 10 percent slopes, eroded ... 18
GwD2—Gwinnett sandy clay loam, 10 to 15 percent slopes, eroded ... 18
HyB—Helena sandy loam, 2 to 6 percent slopes ... 19
HyC—Helena sandy loam, 6 to 10 percent slopes ... 19
LoD—Louisa gravelly fine sandy loam, 6 to 15 percent slopes ... 19
LoF—Louisa gravelly fine sandy loam, 15 to 40 percent slopes ... 20
MdB—Madison gravelly sandy loam, 2 to 6 percent slopes ... 20
MdC—Madison gravelly sandy loam, 6 to 10 percent slopes ... 20
MdE—Madison gravelly sandy loam, 15 to 25 percent slopes ... 21
MfC2—Madison gravelly sandy clay loam, 6 to 10 percent slopes, eroded ... 21

Page

MfD2—Madison gravelly sandy clay loam, 10 to 15 percent slopes, eroded ... 21
MuC—Madison-Urban land complex, 2 to 10 percent slopes ... 22
MuE—Madison-Urban land complex, 10 to 25 percent slopes ... 22
MvC2—Musella clay loam, 6 to 10 percent slopes, eroded ... 23
MwE—Musella stony clay loam, 10 to 25 percent slopes ... 23
PgC2—Pacolet sandy clay loam, 6 to 10 percent slopes, eroded ... 23
PgD2—Pacolet sandy clay loam, 10 to 15 percent slopes, eroded ... 24
PgE2—Pacolet sandy clay loam, 15 to 25 percent slopes, eroded ... 24
PhE3—Pacolet-Udorthents complex, gullied ... 24
PUF—Pacolet soils, 15 to 40 percent slopes ... 25
Rh—Riverview loam ... 25
RK—Riverview-Chewacla association ... 25
Ro—Roanoke silty clay loam, overwash ... 26
Rx—Rock outcrop, granite ... 26
Ud—Urban land ... 26
VaB—Vance sandy loam, 2 to 6 percent slopes ... 27
VaC—Vance sandy loam, 6 to 10 percent slopes ... 27
WeC—Wedowee sandy loam, 6 to 10 percent slopes ... 27
WEE—Wedowee soils, 10 to 25 percent slopes ... 28
WhB—Wickham fine sandy loam, 2 to 6 percent slopes ... 28
WhC—Wickham fine sandy loam, 6 to 10 percent slopes ... 29
WvC—Wilkes gravelly sandy loam, 4 to 10 percent slopes ... 29
WvF—Wilkes gravelly sandy loam, 10 to 35 percent slopes ... 29

Summary of Tables

Page

Acreage and proportionate extent of the soils (Table 4) 68
Coweta County. Heard County. Troup County. Total—Area, Extent.

Building site development (Table 8) 76
Shallow excavations. Dwellings without basements. Dwellings with basements. Small commercial buildings. Local roads and streets.

Capability classes and subclasses (Table 6) 71
Total acreage. Major management concerns (Subclass)—Erosion (e), Wetness (w), Soil problem (s), Climate (c).

Classification of the soils (Table 18) 102
Family or higher taxonomic class.

Construction materials (Table 10) 82
Roadfill. Sand. Gravel. Topsoil.

Engineering properties and classifications (Table 14) 93
Depth. USDA texture. Classification—Unified, AASHTO. Fragments greater than 3 inches. Percentage passing sieve number—4, 10, 40, 200. Liquid limit. Plasticity index.

Engineering test data (Table 17) 101
Report number. Depth. Moisture density—Maximum dry density, Optimum moisture. Volume change in percent—Shrinkage, Swell, Total volume change. Mechanical analysis—Percentage passing sieve—3/4 in., 3/8 in., No. 4, No. 10, No. 40, No. 200; Percentage smaller than—0.05 mm., 0.02 mm., 0.005 mm., 0.002 mm. Liquid limit. Plasticity index. Classification—AASHTO, Unified.

Freeze dates in spring and fall (Table 2) 67
Temperature—24 F or lower, 28 F or lower, 32 F or lower.

Growing season length (Table 3) 67
Daily minimum temperature during growing season—Higher than 24 F, Higher than 28 F, Higher than 32 F.

Physical and chemical properties of soils (Table 15) 97
Depth. Permeability. Available water capacity. Soil reaction. Shrink-swell potential. Risk of corrosion—Uncoated steel, Concrete. Erosion factors—K, T.

Recreational development (Table 12) 87
Camp areas. Picnic areas. Playgrounds. Paths and trails.

Sanitary facilities (Table 9) 79
Septic tank absorption fields. Sewage lagoon areas. Trench sanitary landfill. Area sanitary landfill. Daily cover for landfill.

Soil and water features (Table 16) 99
Hydrologic group. Flooding—Frequency, Duration, Months. High water table—Depth, Kind, Months. Bedrock—Depth, Hardness.

Temperature and precipitation data (Table 1) 66
Temperature. Precipitation.

Water management (Table 11) 85
Limitations for—Pond reservoir areas; Embankments, dikes, and levees. Features affecting—Drainage, Irrigation, Terraces and diversions, Grassed waterways.

Wildlife habitat potentials (Table 13) 90
Potential for habitat elements—Grain and seed crops, Grasses and legumes, Wild herbaceous plants, Hardwood trees, Coniferous plants, Wetland plants, Shallow water areas. Potential as habitat for—Openland wildlife, Woodland wildlife, Wetland wildlife.

Woodland management and productivity (Table 7) 72
Ordination symbol. Management concerns—Erosion hazard, Equipment limitation, Seedling mortality. Potential productivity—Important trees, Site index. Trees to plant.

Yields per acre of crops and pasture (Table 5) 69
Corn. Cotton lint. Soybeans. Wheat. Oats. Tall fescue. Improved bermudagrass.

Foreword

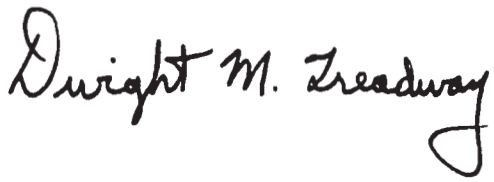
The Soil Survey of Coweta, Heard, and Troup Counties, Georgia, contains much information useful in any land-planning program. Of prime importance are the predictions of soil behavior for selected land uses. Also highlighted are limitations or hazards to land uses that are inherent in the soil, improvements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

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

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

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

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



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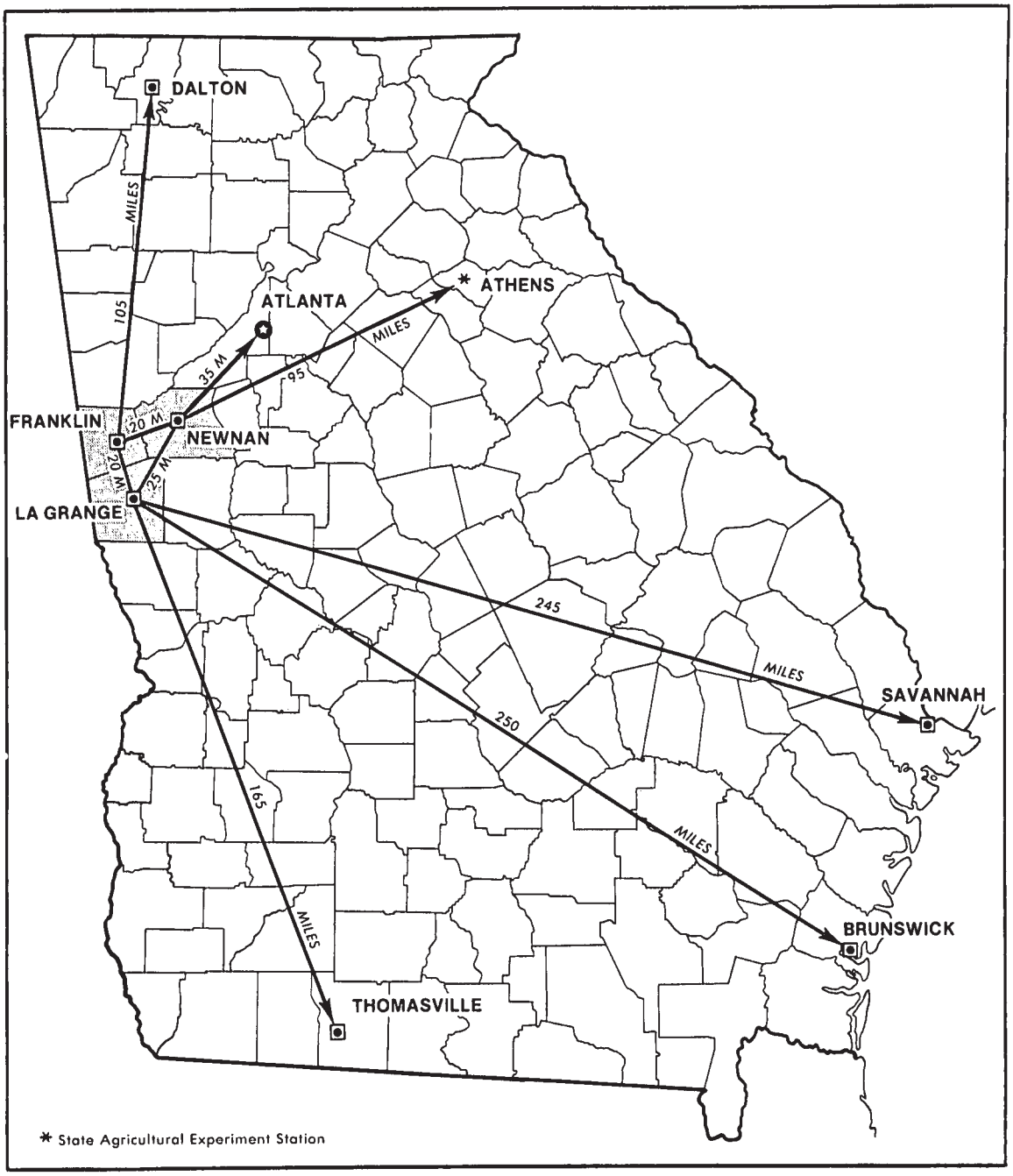

Location of Coweta, Heard, and Troup Counties, Georgia.

SOIL SURVEY OF COWETA, HEARD, AND TROUP COUNTIES, GEORGIA

By Jule F. Brooks, Soil Conservation Service

Soils surveyed by Jule F. Brooks, Thomas N. Crabb,
and Robert D. Wells, Soil Conservation Service

U. S. Department of Agriculture, Soil Conservation Service,
in cooperation with the University of Georgia, College of Agriculture,
Agricultural Experiment Stations

COWETA, HEARD, AND TROUP COUNTIES are in the west-central part of Georgia (See opposite page). The survey covers a land area of 738,752 acres, or 1,154 square miles. Coweta County has 283,072 acres, or 442 square miles. Heard County has 190,080 acres, or 297 square miles. Troup County has 265,600 acres, or 415 square miles.

Coweta, Heard, and Troup Counties are in the Southern Piedmont Major Land Resource Area. Heard and Troup Counties and the western part of Coweta County are in the Chatahoochee River watershed. The Chattahoochee River is the northwestern boundary of Coweta County. It flows mostly southwesterly through Heard County into Lake West Point. This lake occupies most of the Chattahoochee River flood plain in extreme southern Heard County and in Troup County. From the lake, the Chattahoochee River flows south to Harris County. The eastern part of Coweta County is in the Flint River watershed. The eastern boundary of Coweta County is Line Creek.

The landscape consists of ridgetops and hillsides that are dissected by numerous drainageways. The survey area is characterized mostly by very gently sloping to sloping ridgetops on uplands. The hillsides near the major streams, however, are strongly sloping or steep. Narrow to wide, nearly level flood plains are throughout the survey area and are commonly adjacent to steep hillsides. Elevation of the uplands ranges from about 800 feet in the southern part of Coweta and Troup Counties to about 1,400 feet in the northwestern part of Heard County.

General nature of the counties

Ervin P. Rayfield, planning director, Chattahoochee-Flint Area Planning and Development Commission, assisted in preparing this section.

This section gives general information about the counties concerning their climate; organization, settlement, and population; industry; natural resources; and farming.

Climate

This subsection was prepared by the National Climatic Center, Asheville, North Carolina.

Coweta, Heard, and Troup Counties have long, hot summers because moist tropical air from the Gulf of Mexico persistently covers the area. Winters are cool and fairly short. They are interrupted only rarely by a cold wave, which moderates in 1 or 2 days. Precipitation is fairly heavy throughout the year, but reaches a slight peak in winter. Prolonged droughts are rare. Summer precipitation, mainly afternoon thundershowers, is adequate for all crops.

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

In winter the average temperature is 46 degrees F, and the average daily minimum is 35 degrees. The lowest temperature on record, minus 3 degrees, occurred at Newnan on January 24, 1963. In summer the average temperature is 78 degrees, and the average daily maximum is 89 degrees. The highest temperature, 104 degrees, was recorded on July 23, 1952.

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

Of the total annual precipitation, 26 inches, or 50 percent, generally falls during April through September, which includes the growing season for most crops. In 2 years out of 10, the April to September rainfall is less than 22 inches. The heaviest 1-day rainfall during the period of record was 5.30 inches at Newnan on February 25, 1961.

Thunderstorms number about 50 each year, 28 of which occur in summer.

Snowfall is rare. In 85 percent of the winters there is no measurable snowfall, and in 90 percent the snowfall is less than 2 inches. The heaviest snowfall ever observed in 1 day was about 4 inches.

The average relative humidity in midafternoon in spring is less than 55 percent; during the rest of the year it is about 60 percent. Humidity is higher at night in all seasons, and the average at dawn is about 85 percent. The percentage of possible sunshine is 65 percent in summer and 50 percent in winter. The prevailing direction of the wind is from the northwest. Average windspeed is highest, 11 miles per hour, in March.

Severe local storms, including tornadoes, strike occasionally in or near the counties. They are short and cause variable and spotty damage. Every few years, in summer or autumn, a tropical depression or remnant of a hurricane moves inland and causes extremely heavy rains for 1 to 3 days.

Organization, settlement, and population

Land in the survey area was acquired by the United States Government from the Creek Indians at the Treaty of Indian Springs in 1825.

Coweta and Troup Counties were created by legislative act in 1826. Heard County was created, in 1830, from parts of Carroll, Coweta, and Troup Counties.

Settlement was progressing well by 1840. Most of the settlers were from east and middle Georgia. According to the U.S. Bureau of Census, the population of the survey area was 81,461 in 1940, increased to 84,602 in 1950, and decreased to 82,130 in 1970. Based on the recent increase of industry in the survey area, the Chattahoochee-Flint Area Planning and Development Commission anticipates the trend of population will show a steady increase.

Newnan, the largest town and the county seat of Coweta County, had a population of 11,205 in 1970. Other towns in the county are Grantville, Palmetto, Moreland, Haralson, Senoia, Sharpsburg, and Turin.

Franklin, the largest town and the county seat of Heard County, had a population of 749 in 1970. Other towns in the county are Centralhatchee, Corinth, and Ephesus.

La Grange, the largest town and the county seat of Troup County, had a population of 23,301 in 1970. Other towns in the county are Hogansville, Mountville, and West Point.

Industry

In 1976 about 12,000 people were employed by more than 90 industrial plants in the survey area. Textile, garment, carpet, and aluminum industries employed the most people. Other products manufactured or processed in the survey area include: towels and sheets, synthetic carpet yarn, carpeting, clothing, upholstery and other fabric, aluminum and plastic products, pine and hardwood lumber, and boats.

Natural resources

Soil is the most important natural resource in the survey area. Livestock, pulpwood, timber, and crops are the marketable products derived from the soil.

The rivers and streams in the area are excellent sources of water for towns, industries, and irrigation. Most farms have a flowing stream and a favorable site to impound water for livestock use and family recreation. On most farms, shallow wells are dug or drilled to provide water for domestic use. These wells commonly yield 2 to 5 gallons of water per minute and are less than 60 feet deep. Drilling, rather than digging, for water is becoming more common for many rural homes. Drilled wells are about 6 to 8 inches in diameter and 100 to 250 feet deep. They generally yield 5 to 15 gallons of water per minute. Lake West Point covers 20,160 acres in Troup County and 2,945 acres in Heard County. This lake is a multiple-purpose facility built by the Army Corps of Engineers for flood control, hydroelectric power, and recreation.

Farming

The first settlers cleared small tracts of land and grew corn, wheat, barley, and vegetables. They raised cattle, hogs, chickens, and sheep for home use and for trading. Later, large tracts of land were cleared for cotton plantations and peach orchards. The land was bare most of the year and underwent a large soil loss. By the early 1900's, much of the land was eroded, and gullies dissected many hillsides.

The enactment of the Soil Conservation District legislation in 1937 stirred the interest of many landowners in the survey area. The West Georgia Soil and Water Conservation District was organized on April 24, 1939. Coweta and Heard Counties subsequently joined this District. The Pine Mountain Soil and Water Conservation District was organized on July 17, 1939, and Troup County joined this District in September 1944. Terraces, waterways, and plantings of close-growing crops, such as small grain, lespedezas, fescuegrass, and trees, were common on most farms.

From the depression of the 1930's and through World War II, many people left the farms to find jobs in factories or defense plants. This trend continued through the 1950's. Many acres of cropland were seeded to grasses. Because of the large acreage in grassland, cattle operations began to increase.

According to the U.S. Census of Agriculture, 1,141 farms were in the survey area in 1969. The average size of each farm was 216 acres. Out of a total of 738,752 acres, 251,250 acres were in farms in 1969. Of the total value of all farm products, livestock and livestock products accounted for 83 percent, agricultural crops made up 13 percent, and forest products comprised 4 percent. Several

large tracts of woodland scattered throughout the survey area are owned by timber and pulp companies.

How this survey was made

Soil scientists made this survey to learn what kinds of soil are in the survey area, where they are, and how they can be used. The soil scientists went into the area knowing they likely would locate many soils they already knew something about and perhaps identify some they had never seen before. They observed the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; the kinds of native plants or crops; the kinds of rock; and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material, which has been changed very little by leaching or by the action of plant roots.

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

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

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

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

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

General soil maps for broad land use planning

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

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

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

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

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

Descriptions and potentials of map units in Coweta County

Nearly level soils that formed in alluvial sediment; on flood plains and low terraces

Two units in Coweta County consist of nearly level soils on flood plains and low terraces. The landscape is characterized by well drained or somewhat poorly drained, loamy soils that are at a higher elevation and by poorly

drained, clayey soils that are at a lower elevation. Slopes are less than 2 percent. Probability of flooding during winter and spring is high.

1. Riverview-Chewacla-Roanoke

Nearly level, well drained, somewhat poorly drained, and poorly drained soils that have a loamy or clayey subsoil

This map unit consists of soils on narrow to wide flood plains. The landscape is one of nearly level, low relief. It is made up of areas of low, poorly drained soils and areas of somewhat higher, better drained soils. Probability of flooding during winter and spring is high. Slopes are less than 2 percent.

This map unit makes up about 10 percent of the county. About 45 percent of the unit is Riverview soils, 40 percent is Chewacla soils, 8 percent is Roanoke soils, and the remaining 7 percent is minor soils.

Riverview soils are well drained. Typically the surface layer is dark brown loam about 5 inches thick. The subsoil extends to a depth of 34 inches and is predominantly dark yellowish brown silty clay loam. Below it, to a depth of 65 inches or more, is predominantly dark brown loamy coarse sand.

Chewacla soils are somewhat poorly drained. Typically the surface layer is dark brown loam about 8 inches thick. The subsoil extends to a depth of 65 inches or more. It is brown loam that has grayish brown mottles in the upper part, and gray silty clay loam that has strong brown mottles in the lower part.

Roanoke soils are poorly drained. Typically the surface layer is silty clay loam about 14 inches thick. The upper part is recent overwash and is predominantly brown; the lower part is gray. The subsoil, to a depth of 65 inches or more, is gray clay mottled with brown.

The minor soil in this unit is in the Altavista series. This soil is moderately well drained and commonly is at higher elevation on stream terraces.

The soils of this map unit are mainly wooded, but a few areas are used for cultivated crops and pasture. The somewhat higher areas of better drained soils have fair potential for farming and good potential for pasture grasses. Potential for wood crops is good, but equipment limitation and seedling mortality are common management concerns.

This unit has a poor potential for urban use. Flooding and wetness are primary limitations for use and management of this unit.

2. Riverview

Nearly level, well drained soils that are loamy throughout

This map unit consists of soils on flood plains and natural levees mainly adjacent to the Chattahoochee River. Probability of flooding during winter is high. Slopes are less than 2 percent.

This map unit makes up about 1 percent of the county. Riverview soils make up about 76 percent of the unit, and the remaining 24 percent is minor soils.

Riverview soils typically have a dark brown loam surface layer about 5 inches thick. The subsoil extends to a depth of 34 inches and is predominantly dark yellowish brown silty clay loam. Below it, to a depth of 65 inches or more, is predominantly dark brown loamy coarse sand.

The minor soils in this unit are in the Altavista and Chewacla series. Altavista soils are moderately well drained. They commonly are at higher elevation on stream terraces. Chewacla soils are somewhat poorly drained and are in adjacent areas, commonly at lower elevation.

The soils of this map unit are used mainly for pasture. Some areas are wooded, however, and a few areas are used for cultivated crops (fig. 1). The soils have good potential for intensive cropping and for pasture. Potential for wood crops is good, but equipment limitation and seedling mortality are management concerns.

This unit has poor potential for urban uses. During winter these soils commonly are flooded for brief periods. Flooding is the primary limitation for urban uses.

Very gently sloping to sloping soils that formed in material weathered from granite, gneiss, or mica schist; on uplands

Three units in Coweta County consist of well drained or moderately well drained soils that have a red or brown clayey subsoil. These soils are on gently sloping and very gently sloping ridgetops; on low, broad divides between streams; and on gently sloping and sloping hillsides. Slopes are 2 to 15 percent.

3. Cecil-Madison-Appling

Very gently sloping, well drained soils that have a reddish or brownish clayey subsoil

This map unit consists of soils on broad ridgetops and on divides between streams. Slopes are smooth and convex and range from 2 to 6 percent.

This map unit makes up about 16 percent of the county. About 46 percent of the unit is Cecil soils, 37 percent is Madison soils, 10 percent is Appling soils, and the remaining 7 percent is minor soils.

Cecil soils share the broad ridgetops with Madison soils. They typically have a reddish brown sandy loam surface layer about 5 inches thick. The subsoil extends to a depth of 53 inches and is red. It is clay in the upper part and clay loam in the lower part. The underlying material, to a depth of 72 inches or more, is mottled red and brown saprolite.

Madison soils are on broad ridgetops adjacent to Cecil soils. They typically have a brown gravelly sandy loam surface layer about 5 inches thick. The subsoil extends to a depth of about 38 inches and is predominantly red. It is sandy clay loam in the upper few inches, clay in the

middle part, and clay loam in the lower part. Below it, to a depth of 52 inches or more, is weathered mica schist.

Appling soils are on low divides between streams. They typically have a dark grayish brown sandy loam surface layer about 5 inches thick. The subsoil extends to a depth of 52 inches and is predominantly yellowish brown. It is sandy clay loam in the upper few inches; sandy clay and clay in the middle part; and mottled yellowish brown, yellowish red, and very pale brown sandy clay loam in the lower part. The underlying material, to a depth of 65 inches or more, is mottled brown and red saprolite.

The minor soils in this unit are the Davidson, Vance, and Wickham soils. Davidson soils share the broad ridgetops with Cecil and Madison soils on uplands, and Vance and Appling soils are on divides between streams at a lower elevation. Wickham soils are on the lower parts of high stream terraces.

The soils of this map unit are used mainly for cultivated crops and pasture, but some have reverted to woodland. The soils have good potential for farming, but intensive row cropping is limited unless slopes are protected from erosion. This unit has good potential for pasture grasses. Potential for wood crops is fair. Use and management of these soils for woodland are not significantly limited.

This unit has good potential for most urban uses. Most of the soils in the unit, however, are clayey. This limitation needs to be considered before installing most sanitary facilities or digging shallow excavations.

4. Appling-Helena

Very gently sloping, well drained and moderately well drained soils that have a brownish clayey subsoil

This map unit consists of soils on broad divides between streams in lower areas of uplands. Slopes are smooth and convex and range from 2 to 6 percent.

This map unit makes up about 3 percent of the county. About 79 percent of the unit is Appling soils, 20 percent is Helena soils, and the remaining 1 percent is minor soils.

The well drained Appling soils generally are on the slightly higher divides between streams. They typically have a dark grayish brown sandy loam surface layer about 5 inches thick. The subsoil extends to a depth of 52 inches and is predominantly yellowish brown. It is sandy clay loam in the upper few inches; sandy clay and clay in the middle part; and mottled yellowish brown, yellowish red, and very pale brown sandy clay loam in the lower part. The underlying material, to a depth of 65 inches or more, is mottled brown and red saprolite.

The moderately well drained Helena soils commonly are on the lower divides between streams adjacent to drainageways. They typically have a yellowish brown sandy loam surface layer about 6 inches thick. The subsoil extends to a depth of 24 inches. It is predominantly yellowish brown sandy clay and is mottled with gray in the lower part. Below it, to a depth of 62 inches or more, is light olive gray weathered granite and gneiss.

The minor soil in this unit is in the Vance series. Vance soils share the same divides between streams with Appling soils.

The soils of this map unit are used mainly for cultivated crops and pasture, but some have reverted to woodland. Most of the soils have good potential for farming and pasture grasses, but in places, the potential is less because the subsoil is plastic and limits root penetration. Potential for wood crops is fair. In places, the water table is generally high during winter, which limits the use of equipment.

Most of the unit has good potential for urban uses. In places, however, the subsoil is plastic and has a high shrink-swell potential. All the soils in the unit have a clayey subsoil; this needs to be considered before installing most sanitary facilities and digging shallow excavations.

5. Cecil-Madison

Gently sloping and sloping, well drained soils that have a reddish clayey subsoil

This map unit consists of soils on narrow ridgetops and on short to moderately long hillsides. Slopes are convex and, in many places, contain rills or galled spots, shallow gullies, and an occasional deep gully. Slopes range from 6 to 15 percent.

This map unit makes up about 58 percent of the country. About 46 percent is Cecil soils, 44 percent is Madison soils, and the remaining 10 percent is minor soils.

Cecil soils share the ridgetops and hillsides with Madison soils. They typically have a reddish brown sandy loam surface layer about 5 inches thick. The subsoil extends to a depth of 48 inches and is red. It is clay in the upper part and clay loam in the lower part. Below it, to a depth of 72 inches or more, is mottled red and brown saprolite.

Madison soils are on ridgetops and hillsides adjacent to Cecil soils. They typically have a reddish brown, predominantly gravelly sandy clay loam surface layer about 5 inches thick. The subsoil extends to a depth of about 36 inches and is red. It is clay in the upper part and clay loam in the lower part. Below it, to a depth of 52 inches or more, is weathered mica schist.

The minor soils in this unit are in the Appling and Gwinnett series. Appling soils are on lower divides between streams. Gwinnett soils are adjacent to Cecil and Madison soils on the landscape.

The soils of this map unit are used mainly for pasture and woodland, but some areas are in cultivated crops. The soils have fair potential for pasture grasses and farming, but row cropping is limited unless slopes are protected from erosion. Potential for wood crops is fair. The potential on eroded soils is limited because of the hazard of further erosion, equipment limitations, and seedling mortality.

This unit has a fair potential for most urban uses. The soils in the unit have a clayey subsoil; this needs to be considered before installing most sanitary facilities and

digging shallow excavations. Eroded soils have a surface layer that is too clayey. If recreational development is planned, this limitation needs to be taken into account.

Sloping to steep soils that formed in material weathered from granite, gneiss, or mica schist; on uplands

Two units in Coweta County consist of well drained soils that have a red or brown clayey subsoil. These soils are on sloping and moderately steep, narrow ridgetops and hillsides and sloping to steep hillsides. Slopes range from 10 to 40 percent.

6. Pacolet-Wedowee

Sloping to steep, well drained soils that have a reddish or brownish clayey subsoil

This map unit consists of soils on narrow ridgetops and on hillsides. Slopes are convex and, in most places, contain rills or galled spots, shallow gullies, and an occasional deep gully. Slopes range from 10 to 40 percent.

This map unit makes up about 7 percent of the county. About 73 percent of the unit is Pacolet soils, 23 percent is Wedowee soils, and the remaining 4 percent is minor soils.

Pacolet soils commonly are eroded. They share the ridgetops and hillsides with Wedowee soils. Pacolet soils typically have a dark grayish brown sandy loam surface layer about 6 inches thick. The subsoil extends to a depth of about 33 inches. It is yellowish red sandy clay loam in the upper few inches, red clay in the middle part, and yellowish red sandy clay loam in the lower part. Below it, to a depth of 60 inches or more, is weathered granite, gneiss, and mica schist.

Wedowee soils commonly are uneroded. They are on ridgetops and hillsides adjacent to Pacolet soils. Wedowee soils typically have a sandy loam surface layer about 7 inches thick. It is dark grayish brown in the upper part and yellowish brown in the lower part. The subsoil extends to a depth of 34 inches. It is yellowish brown sandy clay loam in the upper few inches; yellowish red clay mottled with red and light olive brown in the middle part; and mottled yellowish red, red, and reddish yellow clay loam in the lower part. Below it, to a depth of 60 inches or more, is soft weathered gneiss and granite.

The minor soil in this unit is the Wilkes soil. Also, this unit is 1 percent Rock outcrop, granite. Wilkes soils and Rock outcrop, granite, are in the same landscape as Pacolet and Wedowee soils.

The soils of this map unit are used for woodland. They have poor potential for farming, pasture grasses, and urban uses. Slope is the primary management concern. Potential for wood crops is fair. It is limited mainly because of the hazard of erosion, equipment limitation, and seedling mortality. These limitations need careful attention if this unit is managed for woodland.

7. Madison-Pacolet

Moderately steep, well drained soils that have a reddish clayey subsoil

This map unit consists of soils on hillsides. Slopes are convex and in many places, contain rills or galled spots, shallow gullies, and an occasional deep gully. Slopes are 15 to 25 percent.

This map unit makes up about 5 percent of the county. About 59 percent of the unit is Madison soils, 27 percent is Pacolet soils, and the remaining 14 percent is minor soils.

Madison soils share hillsides with Pacolet soils. Madison soils typically have a brown gravelly sandy loam surface layer about 6 inches thick. The subsoil extends to a depth of about 40 inches and is predominantly red. It is sandy clay loam in the upper few inches, clay in the middle part, and clay loam in the lower part. Below it, to a depth of 52 inches or more, is weathered mica schist.

Pacolet soils are on hillsides adjacent to Madison soils. They typically have a brown sandy clay loam surface layer about 2 inches thick. The subsoil extends to a depth of about 28 inches. It is yellowish red sandy clay loam in the upper part, red clay in the middle part, and yellowish red clay loam in the lower part. Below it, to a depth of 60 inches or more, is yellowish red saprolite.

The minor soils in this unit are in the Louisa and Musella soils. Louisa soils are shallow and well drained or somewhat excessively drained. They are adjacent to Madison soils on hillsides. Musella soils are shallow and commonly share hillsides with both the Madison and Pacolet soils.

The soils in this map unit are wooded. They have poor potential for farming, pasture grasses, and urban uses. Slope is the primary concern. Potential for wood crops is fair. It is limited mainly because of the hazard of erosion, equipment limitations, and seedling mortality. These limitations need careful attention if this unit is managed for woodland.

Descriptions and potentials of map units in Heard County

Nearly level soils that formed in alluvial sediment; on flood plains

Two units in Heard County consist of nearly level loamy soils on flood plains. The landscape is characterized by well drained soils that are at a higher elevation, and by somewhat poorly drained soils that are at a lower elevation. Slopes are less than 2 percent. Probability of flooding during winter and spring in high.

1. Riverview-Chewacla

Nearly level, well drained and somewhat poorly drained soils that are loamy throughout

This map unit consists of soils on narrow to wide flood plains. The landscape is one of nearly level, low relief. It is made up of somewhat poorly drained soils at low elevation and better drained soils at a somewhat higher elevation. Probability of flooding during winter and spring is high. Slopes are less than 2 percent.

This map unit makes up about 7 percent of the county. About 45 percent of the unit is Riverview soils, 40 percent is Chewacla soils, and the remaining 15 percent is minor soils.

Riverview soils are well drained. They typically have a dark brown loam surface layer about 5 inches thick. The subsoil extends to a depth of 34 inches and is predominantly dark yellowish brown silty clay loam. Below it, to a depth of 65 inches, is predominantly dark brown loamy coarse sand.

Chewacla soils are somewhat poorly drained. They typically have a dark brown loam surface layer about 8 inches thick. The subsoil extends to a depth of 65 inches or more. It is brown loam that has grayish brown mottles in the upper part and gray silty clay loam that has strong brown mottles in the lower part.

The minor soils in this unit are in the Altavista and Roanoke series. Altavista soils are moderately well drained and commonly are at a higher elevation on stream terraces. Roanoke soils are poorly drained and are at a low elevation on stream terraces within the flood plain.

The soils of this map unit are mainly wooded, but a few areas are used for cultivated crops and pasture. The soils have fair potential for farming and good potential for pasture. Potential for wood crops is high, but equipment limitation and seedling mortality are management concerns.

This unit has poor potential for urban uses. Flooding and wetness are primary limitations for use and management.

2. Riverview

Nearly level, well drained soils that are loamy throughout

This map unit consists of soils on flood plains and natural levees mainly adjacent to the Chattahoochee River. Probability of flooding during winter is high. Slopes are less than 2 percent.

This map unit makes up about 3 percent of the county. Riverview soils make up about 98 percent of the unit, and the remaining 2 percent is minor soils.

Riverview soils typically have a dark brown loam surface layer about 5 inches thick. The subsoil extends to a depth of 34 inches and is predominantly dark yellowish brown silty clay loam. Below it, to a depth of 65 inches or more, is predominantly dark brown loamy coarse sand.

The minor soils in this unit are in the Altavista and Chewacla series. Altavista soils are moderately well drained. They commonly are at higher elevation on stream terraces. Chewacla soils are somewhat poorly drained and are in adjacent areas, commonly at a lower elevation.

The soils of this map unit are used mainly for pasture. Some areas are wooded, however, and a few areas are used for cultivated crops. The soils have good potential for intensive cropping and for pasture. Potential for wood crops is good, but equipment limitations and seedling mortality are management concerns.

This unit has poor potential for urban uses. During winter these soils commonly are flooded for brief periods. Flooding is the primary limitation for urban uses.

Very gently sloping to sloping soils that formed in material weathered from granite, gneiss, or mica schist; on uplands

Four units in Heard County consist of well drained soils that have a reddish or brownish clayey subsoil. These soils are on gently sloping and very gently sloping ridgetops; low, broad divides between streams; and gently sloping and sloping hillsides. Slopes are 2 to 15 percent.

3. Madison

Gently sloping and sloping, well drained soils that have a reddish clayey subsoil

This map unit consists of soils on narrow ridgetops and hillsides. Slopes are convex and, in many places, contain rills or galled spots, shallow gullies, and an occasional deep gully. Slopes are 6 to 15 percent.

This map unit makes up about 21 percent of the county. Madison soils make up about 89 percent of the unit, and the remaining 11 percent is minor soils.

Madison soils typically have a reddish brown predominantly gravelly sandy clay loam surface layer about 5 inches thick. The subsoil extends to a depth of 36 inches and is red. It is clay in the upper part and clay loam in the lower part. Below it, to a depth of 52 inches or more, is weathered mica schist.

The minor soils in this unit are in the Appling and Louisa series. Appling soils are on lower divides between streams. Louisa soils are shallow and well drained or somewhat excessively drained. They commonly are on hillsides adjacent to Madison soils on upland ridgetops.

The soils of this map unit are used mainly for pasture and woodland, but some areas are in cultivated crops. They have fair potential for pasture grasses and farming, but row cropping is limited unless slopes are protected from erosion. Potential for wood crops is fair. The potential for eroded soils is generally limited because of the hazard of further erosion, equipment limitations, and seedling mortality.

This unit has fair potential for most urban uses. The soils in this unit have a clayey subsoil; this limitation needs to be considered before installing most sanitary facilities and digging shallow excavations. Eroded soils have a surface layer that is too clayey. If recreational development is planned, this limitation needs to be taken into account.

4. Cecil-Appling

Very gently sloping, well drained soils that have a reddish or brownish clayey subsoil

This map unit consists of soils on broad ridgetops and on divides between streams on uplands. Slopes are smooth and convex and are 2 to 6 percent.

This map unit makes up about 1 percent of the county. About 77 percent of the unit is Cecil soils, 15 percent is Appling soils, and the remaining 8 percent is minor soils.

Cecil soils are on broad ridgetops. They typically have a reddish brown sandy loam surface layer about 5 inches thick. The subsoil extends to a depth of 53 inches and is red. It is clay in the upper part and clay loam in the lower part. The underlying material, to a depth of 72 inches or more, is mottled red and brown saprolite.

Appling soils are on lower divides between streams. They typically have a dark grayish brown sandy loam surface layer about 5 inches thick. The subsoil extends to a depth of 52 inches and is predominantly yellowish brown. It is sandy clay loam in the upper few inches; sandy clay and clay in the middle part; and mottled yellowish brown, yellowish red, and very pale brown sandy clay loam in the lower part. The underlying material, to a depth of 65 inches or more, is mottled brown and red saprolite.

The minor soils in the unit are in the Davidson and Madison series. These soils share the broad ridgetops with Cecil soils.

The soils of this map unit are used mainly for cultivated crops and pasture, but some have reverted to woodland. They have good potential for farming, but intensive row cropping is limited unless slopes are protected from erosion. Potential for wood crops is fair. These soils are not significantly limited in use or management for woodland.

This unit has good potential for most urban uses. The soils in the unit, however, are clayey; this needs to be considered before installing most sanitary facilities and digging shallow excavations.

5. Appling

Very gently sloping, well drained soils that have a brownish clayey subsoil

This map unit consists of soils on broad, low divides between streams. Slopes are smooth and convex and range from 2 to 6 percent.

This map unit makes up about 2 percent of the county. Appling soils make up about 90 percent of the unit, and the remaining 10 percent is minor soils.

Appling soils typically have a dark grayish brown sandy loam surface layer about 5 inches thick. The subsoil extends to a depth of 52 inches and is predominantly yellowish brown. It is sandy clay loam in the upper few inches; sandy clay and clay in the middle part; and mottled yellowish brown, yellowish red, and very pale brown sandy clay loam in the lower part. The underlying material, to a depth of 65 inches or more, is mottled brown and red saprolite.

The minor soils in the unit are in the Helena and Vance series. Helena soils are moderately well drained and generally are at a lower elevation than Appling soils. Also, they have a perched water table during the winter. Vance soils are adjacent to Appling soils on the landscape.

The soils of this map unit are used mainly for cultivated crops and pasture, but some are wooded. Most areas have good potential for farming and pasture grasses. Potential for wood crops is fair. These soils are not significantly limited in use or management for woodland.

This unit has good potential for urban uses. However, these soils do have a clayey subsoil; this needs to be considered before installing most sanitary facilities and digging shallow excavations.

6. Cecil-Madison-Appling

Gently sloping and sloping, well drained soils that have a reddish or brownish clayey subsoil

This map unit consists of soils on narrow ridgetops and hillsides and soils on lower divides between streams. Slopes are convex and, in many places, contain rills or galled spots, shallow gullies, and an occasional deep gully. Slopes range from 6 to 15 percent.

This map unit makes up about 29 percent of the county. About 55 percent is Cecil soils, 20 percent is Madison soils, 9 percent is Appling soils, and the remaining 16 percent is minor soils.

Cecil soils generally share the higher ridgetops and hillsides with Madison soils. Cecil soils typically have a reddish brown sandy loam surface layer about 5 inches thick. The subsoil extends to a depth of 48 inches and is red. It is clay in the upper part and clay loam in the lower part. Below it, to a depth of 72 inches or more, is mottled red and brown saprolite. In places, eroded Cecil soils commonly have a red sandy clay loam surface layer.

Madison soils are on the higher ridgetops and hillsides adjacent to Cecil soils. They typically have a reddish brown predominantly gravelly sandy clay loam surface layer about 5 inches thick. The subsoil extends to a depth of 36 inches and is red. It is clay in the upper part and clay loam in the lower part. Below it, to a depth of 52 inches or more, is weathered mica shist.

Appling soils are on the lower ridgetops and hillsides of divides between streams. They typically have a brown gravelly sandy loam surface layer about 5 inches thick. The subsoil extends to a depth of 48 inches and is strong brown clay mottled with red. Below it, to a depth of 60 inches or more, is mottled red and brown saprolite.

The minor soils in this unit are in the Gwinnett, Pacolet, Wedowee, and Wickham series. Gwinnett, Pacolet, and Wedowee soils share ridgetops and hillsides with Cecil and Madison soils. Wickham soils are on high stream terraces.

The soils of this map unit are used mainly for pasture and woodland, but some areas are in cultivated crops.

They have fair potential for pasture grasses and farming, but row cropping is limited unless slopes are protected from erosion. Potential for wood crops is fair. The potential for eroded soils is commonly limited because of the hazard of further erosion, equipment limitation, and seedling mortality.

This unit has fair potential for most urban uses. The soils in the unit have a clayey subsoil; this needs to be considered before installing most sanitary facilities and digging shallow excavations. Eroded soils have a surface layer that is too clayey. If recreational development is planned, this limitation needs to be taken into account.

Sloping to steep soils that formed in material weathered from granite, gneiss, or mica schist; on uplands

Three units in Heard County consist of well drained and somewhat excessively drained soils that have a reddish or brownish clayey subsoil or brownish loamy subsoil. These soils are on sloping and moderately steep, narrow ridgetops and hillsides and sloping to steep hillsides. Slopes range from 10 to 40 percent.

7. Madison-Louisa

Moderately steep and steep, well drained and somewhat excessively drained soils that have a reddish clayey subsoil or brownish loamy subsoil

This map unit consists of soils on hillsides that are dissected by numerous drainageways. Slopes are convex and, in a few places, contain rills or galled spots, shallow gullies, and an occasional deep gully. Slopes range from 15 to 40 percent.

This map unit makes up about 17 percent of the county. About 43 percent of the unit is Madison soils, 40 percent is Louisa soils, and the remaining 17 percent is minor soils.

Madison soils are well drained. They typically have a brown gravelly sandy loam surface layer about 6 inches thick. The subsoil extends to a depth of about 40 inches and is predominantly red. It is sandy clay loam in the upper few inches, clay in the middle part, and clay loam in the lower part. Below it, to a depth of 52 inches or more, is weathered mica schist.

Louisa soils are somewhat excessively drained. They typically have a mainly dark yellowish brown gravelly fine sandy loam surface layer about 5 inches thick. The brown subsoil extends to a depth of about 16 inches. It is gravelly loam interrupted in short horizontal distances by clay loam. Below it, to a depth of 84 inches or more, are tilted layers of weathered gray mica schist.

The minor soils in this unit are in the Musella, Pacolet, and Wilkes series. These soils share the hillsides with Madison and Louisa soils.

The soils of this map unit are mainly used for woodland. A few tracts are used for pasture (fig. 2). The soils have poor potential for farming, pasture grasses, and urban uses. Slope is the primary management concern. Potential for wood crops is fair. It is limited mainly because of the hazard of erosion, equipment limitations, and seedling mortality. These limitations need careful attention if this unit is managed for woodland.

8. Pacolet-Wedowee

Sloping to steep, well drained soils that have a reddish or brownish clayey subsoil

This map consists of soils on narrow ridgetops and on hillsides. Slopes are convex and, in many places, contain rills or galled spots, shallow gullies, and an occasional deep gully. Slopes range from 10 to 40 percent.

This map unit makes up about 16 percent of the county. About 85 percent of the unit is Pacolet soils, 13 percent is Wedowee soils, and the remaining 2 percent is Rock outcrop.

Pacolet soils commonly are eroded. They share the ridgetops and hillsides with Wedowee soils. Pacolet soils typically have a dark grayish brown sandy loam surface layer about 6 inches thick. The subsoil extends to a depth of about 33 inches. It is yellowish red sandy clay loam in the upper few inches, red clay in the middle part, and yellowish red sandy clay loam in the lower part. Below it, to a depth of 60 inches or more, is weathered granite, gneiss, and mica schist.

Wedowee soils are commonly uneroded. They are on ridgetops and hillsides adjacent to Pacolet soils. Wedowee soils typically have a sandy loam surface layer about 7 inches thick. The surface layer is dark grayish brown in the upper part and yellowish brown in the lower part. The subsoil extends to a depth of 34 inches. It is yellowish brown sandy clay loam in the upper few inches; yellowish red clay mottled with red and light olive brown in the middle part; and mottled yellowish red, red, and reddish yellow clay loam in the lower part. Below it, to a depth of 60 inches or more, is soft weathered gneiss and granite.

Rock outcrop, granite, makes up about 2 percent of the unit. It shares the landscape with Pacolet and Wedowee soils.

The soils of this map unit are used for woodland. A few areas are used for pasture. The soils have poor potential for farming, pasture grasses, and urban uses. Slope is the main concern. Potential for wood crops is fair. It is limited mainly because of the hazard of erosion, equipment limitations, and seedling mortality. These limitations need careful attention if this unit is managed for woodland.

9. Pacolet-Madison

Moderately steep, well drained soils that have a reddish clayey subsoil

This map unit consists of soils on hillsides. Slopes are convex and, in many places; contain rills or galled spots, shallow gullies, and an occasional deep gully. Slopes range from 15 to 25 percent.

This map unit makes up about 4 percent of the county. About 75 percent of the unit is Pacolet soils, 23 percent is Madison soils, and the remaining 2 percent is minor soils.

Pacolet soils share hillsides with Madison soils. They typically have a brown sandy clay loam surface layer about 2 inches thick. The subsoil extends to a depth of about 28 inches. It is yellowish red sandy clay loam in the upper part, red clay in the middle part, and yellowish red clay loam in the lower part. Below it, to a depth of 60 inches or more, is yellowish red saprolite.

Madison soils are on hillsides adjacent to Pacolet soils. They typically have a brown gravelly sandy loam surface layer about 6 inches thick. The subsoil extends to a depth of about 40 inches and is predominantly red. It is sandy clay loam in the upper few inches, clay in the middle part, and clay loam in the lower part. Below it, to a depth of 52 inches or more is weathered mica schist.

The minor soils in the unit are in the Louisa, Musella, and Wilkes series. These soils are shallow and predominantly well drained. They commonly are on hillsides adjacent to Pacolet and Madison soils.

The soils of this map unit are mainly used for woodland. A few areas are used for pasture. The soils have poor potential for farming, pasture grasses, and urban use. Slope is the main concern. Potential for wood crops is fair. It is limited mainly because of the hazard of erosion, equipment limitations, and seedling mortality. These limitations need careful attention if this unit is managed for woodland.

Descriptions and potentials of map units in Troup County

Nearly level soils that formed in alluvial sediment; on flood plains and low terraces

Two units in Troup County consist of nearly level soils on flood plains and low terraces. The landscape is characterized by well drained or somewhat poorly drained loamy soils that are at a somewhat higher elevation and by poorly drained clayey soils that are at a lower elevation. Slopes are less than 2 percent. Probability of flooding during winter and spring is high.

1. Riverview-Chewacla-Roanoke

Nearly level, well drained, somewhat poorly drained, and poorly drained soils that have a loamy or clayey subsoil

This map unit consists of soils on narrow to wide flood plains. The landscape is one of nearly level, low relief. It is areas of poorly drained soils at low elevations and areas of better drained soils at somewhat higher elevations. Probability of flooding during winter and spring is high. Slopes are less than 2 percent.

This map unit makes up about 8 percent of the county. About 45 percent of the unit is Riverview soils, 40 percent is Chewacla soils, 15 percent is Roanoke soils, and the remaining 2 percent is minor soils.

Riverview soils are well drained. They typically have a dark brown loam surface layer about 5 inches thick. The subsoil extends to a depth of 34 inches and is predominantly dark yellowish brown silty clay loam. Below it, to a depth of 65 inches or more, is predominantly dark brown loamy coarse sand.

Chewacla soils are somewhat poorly drained. They typically have a dark brown loam surface layer about 8 inches thick. The subsoil extends to a depth of 65 inches or more. It is brown loam that has grayish brown mottles in the upper part and gray silty clay loam that has strong brown mottles in the lower part.

Roanoke soils are poorly drained. They typically have a brown silty clay loam surface layer about 14 inches thick. The upper part is recent overwash and is predominantly brown; the lower part is gray. The subsoil extends to a depth of 65 inches or more and is gray clay mottled with brown.

The minor soil in this unit is in the Altavista series. This soil is moderately well drained and commonly is on higher stream terraces.

The soils of this map unit are mainly used for woodland, but a few areas are used for cultivated crops and pasture. The somewhat higher areas of better drained soils have fair potential for farming and good potential for pasture grasses. Potential for woodland production is good, but equipment limitations and seedling mortality are commonly management concerns.

This unit has poor potential for urban uses. Flooding and wetness are primary concerns for use and management.

2. Riverview

Nearly level, well drained soils that are loamy throughout

This map unit consists of soils on flood plains and natural levees mainly adjacent to the Chattahoochee River. Probability of flooding during winter is high. Slopes are less than 2 percent.

This map unit makes up about 2 percent of the county. Riverview soils make up about 80 percent of the unit, and the remaining 20 percent is minor soils.

Riverview soils typically have a dark brown loam surface layer about 5 inches thick. The subsoil extends to a depth of 34 inches and is predominantly dark yellowish brown silty clay loam. Below it, to a depth of 65 inches or more, is predominantly dark brown loamy coarse sand.

The minor soils in this unit are in the Altavista and Chewacla series. Altavista soils are moderately well drained. They commonly are at a higher elevation on stream terraces. Chewacla soils are somewhat poorly drained and are in adjacent areas, commonly at a lower elevation.

The soils of this map unit are used mainly for pasture. Some areas are wooded, however, and a few areas are used for cultivated crops. The soils have good potential for intensive cropping and for pasture. Potential for wood

crops is good, but equipment limitation and seedling mortality are management concerns.

This unit has poor potential for urban uses. During winter these soils commonly are flooded for brief periods. Flooding is the primary limitation for urban uses.

Very gently sloping to sloping soils that formed in material weathered from granite, gneiss, or mica schist; on uplands

Two units in Troup County consist of well drained soils that have a reddish or brownish clayey subsoil. These soils are on gently sloping and very gently sloping ridgetops; on low, broad divides between streams; and on gently sloping and sloping hillsides. Slopes are 2 to 15 percent.

3. Cecil-Appling-Davidson

Very gently sloping, well drained soils that have a reddish or brownish clayey subsoil

This map unit consists of soils on broad ridgetops and on divides between streams. Slopes are smooth and convex and are 2 to 6 percent.

This map unit makes up about 15 percent of the county. About 57 percent of the unit is Cecil soils, 12 percent is Appling soils, 10 percent is Davidson soils, and the remaining 21 percent is minor soils.

Cecil soils share the broad ridgetops with Davidson soils. They typically have a reddish brown sandy loam surface layer about 5 inches thick. The subsoil extends to a depth of 53 inches and is red. It is clay in the upper part and clay loam in the lower part. The underlying material, to a depth of 72 inches or more, is mottled red and brown saprolite.

Appling soils are on lower divides between streams. They typically have a dark grayish brown sandy loam surface layer about 5 inches thick. The subsoil extends to a depth of 52 inches and is predominantly yellowish brown. It is sandy clay loam in the upper few inches; sandy clay and clay in the middle part; and mottled yellowish brown, yellowish red, and very pale brown sandy clay loam in the lower part. The underlying material, to a depth of 65 inches or more, is mottled brown and red saprolite.

Davidson soils are on broad ridgetops adjacent to Cecil soils. They typically have a dark reddish brown loam surface layer about 7 inches thick. The subsoil extends to a depth of 65 inches or more and is dark red clay.

The minor soils in this unit are in the Helena, Madison, Vance, and Wilkes series. Also, Urban land makes up about 1 percent of the unit. Madison soils are on broad ridgetops adjacent to Cecil and Davidson soils. They also are in areas of Urban land. The moderately well drained Helena, Vance, and Wilkes soils share lower divides between streams with the Appling soils.

The soils of this map unit are used mainly for cultivated crops and pasture, but some have reverted to woodland. They have good potential for farming, but intensive row cropping is limited unless slopes are protected from erosion. The soils have fair potential for pasture grasses. Potential for wood crops is fair. These soils are not significantly limited in use and management for woodland.

This unit has good potential for most urban uses. The soils in this unit, however, are clayey; this needs to be considered before installing most sanitary facilities and digging shallow excavations.

4. Cecil-Madison-Gwinnett

Gently sloping and sloping, well drained soils that have a reddish clayey subsoil

This map unit consists of soils on narrow ridgetops and on short to moderately long hillsides. Slopes are convex and, in some places, contain rills or galled spots, shallow gullies, and an occasional deep gully. Slopes range from 6 to 15 percent.

This map unit makes up about 59 percent of the county. About 72 percent is Cecil soils, 15 percent is Madison soils, 9 percent is Gwinnett soils, and the remaining 4 percent is minor soils.

Cecil soils share ridgetops and hillsides with Madison and Gwinnett soils. They typically have a reddish brown sandy loam surface layer about 5 inches thick. The subsoil extends to a depth of 48 inches and is red. It is clay in the upper part and clay loam in the lower part. Below it, to a depth of 72 inches or more, is mottled red and brown saprolite.

Madison soils are on ridgetops and hillsides adjacent to Cecil and Gwinnett soils. They typically have a reddish brown gravelly sandy clay loam surface layer about 5 inches thick. The subsoil extends to a depth of 36 inches and is red. It is clay in the upper part and clay loam in the lower part. Below it, to a depth of 52 inches or more, is weathered mica schist.

Gwinnett soils are on ridgetops and hillsides near the Cecil and Madison soils. They typically have a dark reddish brown sandy clay loam surface layer about 4 inches thick. The subsoil extends to a depth of 36 inches and is dark red clay. Below it, to a depth of 45 inches or more, is weathered dark colored fractured rock.

The minor soils in this unit are in the Appling, Pacolet, Vance, and Wickham series. Appling and Vance soils are on lower divides between streams. Pacolet soils share the ridgetops and hillsides with Cecil, Madison, and Gwinnett soils. Wickham soils are at a lower elevation on high stream terraces.

The soils of this map unit are used mainly for pasture and woodland. A few areas are used for cultivated crops. The soils have fair potential for pasture grasses and farming, but row cropping is limited unless slopes are protected from erosion. Potential for wood crops is fair. The potential for eroded soils is commonly limited because of the hazard of further erosion, equipment limitations, and seedling mortality.

This unit has fair potential for most urban uses. The soils in the unit have a clayey subsoil; this needs to be considered before installing most sanitary facilities and digging shallow excavations. Eroded soils have a surface layer that is too clayey. If recreational development is planned, this limitation needs to be taken into account.

Moderately steep soils that formed in material weathered from granite, gneiss, or mica schist; on uplands

One unit in Troup County consists of well drained soils that have a reddish clayey subsoil. They are on moderately steep narrow ridgetops and hillsides. Slopes range from 15 to 25 percent.

5. Pacolet-Madison

Moderately steep, well drained soils that have a reddish clayey subsoil

This map unit consists of soils on hillsides. Slopes are convex and, in many places, contain rills or galled spots, shallow gullies, and an occasional deep gully. Slopes range from 15 to 25 percent.

This map unit makes up about 16 percent of the county. About 80 percent of the unit is Pacolet soils, 14 percent is Madison soils, and the remaining 6 percent is minor soils.

Pacolet soils share hillsides with Madison soils. They typically have a brown sandy loam surface layer about 2 inches thick. The subsoil extends to a depth of about 28 inches. It is yellowish red sandy clay loam in the upper part, red clay in the middle part, and yellowish red clay loam in the lower part. Below it, to a depth of 60 inches or more, is yellowish red saprolite.

Madison soils are on hillsides adjacent to Pacolet soils. They typically have a brown gravelly sandy loam surface layer about 6 inches thick. The subsoil extends to a depth of about 40 inches and is predominantly red. It is sandy clay loam in the upper few inches, clay in the middle part, and clay loam in the lower part. Below it, to a depth of 52 inches or more is weathered mica schist.

The minor soils in this unit are in the Louisa, Musella, Wedowee, and Wilkes series. Somewhat excessively drained Louisa soils and well drained Musella and Wilkes soils are shallow to bedrock. Wedowee soils are deep and well drained. These minor soils commonly are on hillsides adjacent to the Pacolet and Madison soils.

The soils of this unit are used for woodland. A few areas are used for pasture. The soils have poor potential for farming, pasture grasses, and urban uses. Slope is the primary concern. Potential for wood crops is fair. It is limited mainly because of the hazard of erosion, equipment limitations, and seedling mortality. These limitations need careful attention if this unit is managed for woodland.

Broad land use considerations

Selecting areas of land for urban development is an important issue in these counties. Each year some land is being developed for urban uses in the towns of La Grange and Newnan. An estimated 7,000 acres, or about 1 percent of the survey area, is urban or built-up land. The general soil maps are most helpful for planning the general outline of urban uses; however, they cannot be used for the selection of sites for specific structures. In general, the soils that have good potential for cultivated crops also have good potential for urban development. The data about specific soils in the survey can be helpful in planning future land use patterns. (See "Soil maps for detailed planning" and "Use and management of the soils.")

Areas where the soils are so unfavorable that urban development is prohibitive are not extensive in these counties. The Riverview-Chewacla-Roanoke unit, the Riverview-Chewacla unit, and the Riverview unit have soils on flood plains, where flooding and wetness are severe limitations. The clayey soils of the Madison-Pacolet unit, the Pacolet-Madison unit, and the Pacolet-Wedowee unit have poor potential for urban development because of slope and because of subsoils that have a slow rate of percolation.

Large areas of less sloping soils can be developed for urban uses at lower costs than can the soils named above. These mainly include soils in the Cecil-Madison unit in Coweta County, the Cecil-Madison-Appling unit in Heard County, and the Cecil-Madison-Gwinnet unit in Troup County.

Two map units are very gently sloping and are excellent farmland. This potential for farming should not be overlooked when considering broad land uses for the Cecil-Madison-Appling unit in Coweta County and the Cecil-Appling-Davidson unit in Troup County.

The map units on flood plains in the survey area have good potential for woodland. Most of the soils on uplands have a fair potential for woodland.

Soil maps for detailed planning

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

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

management concerns and practices needed are discussed.

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

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

Soils of one series can differ in texture of the surface layer or in the underlying substratum and in slope, erosion, stoniness, salinity, wetness, or other characteristics that affect their use. On the basis of such differences, a soil series is divided into phases. The name of a *soil phase* commonly indicates a feature that affects use or management. For example, Cecil sandy loam, 2 to 6 percent slopes, is one of several phases within the Cecil series.

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

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

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

An *undifferentiated group* is made up of two or more soils that could be mapped individually but are mapped as one unit because there is little value in separating them. The pattern and proportion of the soils are not uniform. An area shown on the map has at least one of the dominant (named) soils or may have all of them. Pacolet soils, 15 to 40 percent slopes, is an undifferentiated group in this survey area.

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

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

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

Soil descriptions and potentials

AkB—Altavista fine sandy loam, 2 to 6 percent slopes. This deep, moderately well drained, very gently sloping soil is on narrow stream terraces near the larger creeks and rivers. Slopes are smooth and convex. Individual areas range from 5 to 25 acres.

In a typical profile the surface layer is brown fine sandy loam about 5 inches thick. The subsoil is sandy clay loam and extends to a depth of 46 inches. It is yellowish brown in the upper part, yellowish brown mottled with gray in the middle part, and mottled brown and gray in the lower part. The underlying material, to a depth of 62 inches or more, is mottled brown and gray clay and tongues and pockets of sandy clay loam.

This soil is low in both natural fertility and organic-matter content. It is medium acid or strongly acid throughout, except where the surface layer has been limed. Permeability is moderate, and the available water capacity is medium. Tilth is good. Although the root zone is deep, a water table limits root penetration. It commonly is at a depth of 18 to 30 inches in winter and early in spring.

Included with this soil in mapping are small areas of nearly level Altavista soils that are subject to occasional flooding. Areas of soils that have a gravelly fine sandy loam surface layer and a few intermingled areas of Appling soils are also included. The included soils make up about 10 to 15 percent of this map unit.

This soil has a good potential for row crops, small grain, and hay and pasture. Good tilth is easily maintained by returning crop residue to the soil. Erosion is a moderate hazard if row crops are grown. Conservation tillage and use of cover crops—including grasses and legumes in the cropping system—help to reduce runoff and to control erosion.

This soil has good potential for loblolly pine, yellow-poplar, and black walnut. Wetness limits the use of equipment in managing and harvesting the tree crop. This limitation can be overcome by using equipment in the drier seasons.

This soil has poor potential for most urban uses. Wetness caused by a seasonal high water table is the main

limitation. This limitation could be overcome by installing a drainage system. Capability subclass IIe; woodland suitability group 2w.

AmB—Appling sandy loam, 2 to 6 percent slopes. This deep, well drained, very gently sloping soil is on low, broad divides between streams in the Piedmont Upland. Slopes are smooth and convex. Individual areas range from 10 to 200 acres.

In a typical profile the surface layer is dark grayish brown sandy loam about 5 inches thick. The subsoil is predominantly yellowish brown and extends to a depth of 52 inches. It is sandy clay loam in the upper few inches; sandy clay and clay in the middle part; and mottled yellowish brown, yellowish red, and very pale brown sandy clay loam in the lower part. The underlying material, to a depth of more than 65 inches, is mottled brown and red saprolite.

This soil is low in both natural fertility and organic matter. It is strongly acid or very strongly acid throughout, except where the surface layer has been limed. Permeability is moderate, and available water capacity is medium. Tilth is good, and the soil can be worked throughout a wide range of moisture conditions. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are small areas of Appling gravelly sandy loam, a few areas of Appling sandy clay loam that is eroded, and a few small areas of intermingled Cecil and Helena soils. These areas make up about 10 to 15 percent of this map unit.

This soil has good potential for row crops, small grain, and hay and pasture. High yields can be obtained with good management. Good tilth is easily maintained by returning crop residue to the soil. The hazard of erosion is moderate if cultivated crops are grown. Conservation tillage and the use of cover crops—including grasses and legumes in the cropping system—help to reduce runoff and to control erosion.

This soil has a fair potential for loblolly pine and yellow-poplar. It has no significant limitations for woodland use and management.

This soil has good potential for most urban and recreational uses. Because the subsoil has a slow percolation rate, it is limited for septic tank absorption fields. This limitation can commonly be overcome by good design and careful installation. Capability subclass IIe; woodland suitability group 3o.

AmC—Appling sandy loam, 6 to 10 percent slopes. This deep, well drained, gently sloping soil is on hillsides of low divides between streams in the Piedmont Upland. Slopes are smooth and convex. Individual areas range from 5 to 25 acres.

In a typical profile the surface layer is brown sandy loam about 5 inches thick. The subsoil is strong brown clay mottled with red. It extends to a depth of 48 inches. The underlying material, to a depth of 60 inches or more, is mottled red and brown saprolite.

This soil is low in both natural fertility and organic matter. It is strongly acid or very strongly acid throughout, except where the surface layer has been limed. Permeability is moderate, and available water capacity is medium. Tilth is good, and the soil can be worked throughout a wide range of moisture conditions. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are small areas of Appling gravelly sandy loam, a few areas of Appling sandy clay loam that is eroded, and a few small areas of intermingled Cecil and Wedowee soils. These areas make up about 10 to 20 percent of this map unit.

This soil has fair potential for row crops and small grain. The potential for farming is limited, however, by the small size of the areas and by the slope. This soil has good potential for hay and pasture. Good tilth is easily maintained by returning crop residue to the soil. The hazard by erosion is severe if cultivated crops are grown. Conservation tillage and the use of cover crops—including grasses and legumes in the cropping system—help to reduce runoff and to control erosion.

This soil has a fair potential for loblolly pine and yellow-poplar. It has no significant limitations for woodland use and management.

This soil has fair potential for most urban uses. Because of the slow percolation rate in the subsoil, it is limited for septic tank absorption fields. This limitation can commonly be overcome by good design and careful installation. The clayey subsoil or the slope is a limitation for most sanitary facilities. Slope is a limitation if this soil is used for community development and for most recreational purposes. Capability subclass IIIe; woodland suitability group 3o.

AmD—Appling sandy loam, 10 to 15 percent slopes. This deep, well drained, sloping soil is in narrow areas on the sides of low divides between streams in the Piedmont Upland. Slopes are smooth and short. Individual areas range from 5 to 20 acres.

In a typical profile the surface layer is brown sandy loam about 5 inches thick. The subsoil is yellowish red clay. It extends to a depth of 49 inches. The underlying material, to a depth of 60 inches or more, is mottled red and brown saprolite.

This soil is low in both natural fertility and organic matter. It is strongly acid or very strongly acid throughout, except where the surface layer has been limed. Permeability is moderate, and available water capacity is medium. Tilth is good, and the soil can be worked throughout a wide range of moisture conditions. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are small areas of Appling gravelly sandy loam, a few areas of Appling sandy clay loam that is eroded, and a few small intermingled areas of Cecil, Pacolet, and Wedowee soils. These areas make up about 10 to 20 percent of this map unit.

This soil has poor potential for row crops. The potential for farming is limited by the slope, by the severe hazard of

erosion, and by the small size of areas. This soil has fair potential for hay and pasture.

This soil has fair potential for loblolly pine and yellow-poplar. It has no significant limitations for woodland use or management.

This soil has fair potential for most urban uses. The slow percolation rate in the subsoil is a limitation for septic tank absorption fields. This limitation can commonly be overcome by good design and careful installation. Slope is a limitation if this soil is used for sanitary facilities and for community development. Capability subclass IVe; woodland suitability group 3o.

AnC2—Appling sandy clay loam, 6 to 10 percent slopes, eroded. This deep, well drained, gently sloping soil is on hillsides and ridgetops of low divides between streams in the Piedmont Upland. The surface layer is a mixture of soil material from the original surface layer and the upper part of the subsoil. Slopes are convex and contain rills or galled spots, shallow gullies, and an occasional deep gully (fig. 3). Individual areas range from 5 to 15 acres.

In a typical profile the surface layer is yellowish brown sandy clay loam about 3 inches thick. The subsoil is strong brown clay mottled with red. It extends to a depth of 42 inches. The underlying material, to a depth of 60 inches or more, is mottled red and brown saprolite.

This soil is low in both natural fertility and organic matter. It is strongly acid or very strongly acid throughout, except where the surface layer has been limed. Permeability is moderate, and available water capacity is medium. Tilth is poor because of erosion. Infiltration is slow, and surface runoff is rapid. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are areas of very gently sloping Appling sandy clay loam that is eroded. These areas make up about 20 to 30 percent of this map unit.

This soil has poor potential for row crops and small grain. The potential for farming is limited by the poor workability of the surface layer and by gullies. This soil has fair potential for hay and pasture. Because of poor tilth, seedbed preparation is difficult if grass is to be established.

The soil has fair potential for loblolly pine and yellow-poplar. It has no significant limitations for woodland use and management.

This soil has fair potential for most urban uses. The gullies are limitations, but the landscape can easily be smoothed or modified for most urban uses. The slow rate of percolation in the subsoil is a limitation for septic tank absorption fields. This limitation can commonly be overcome by good design and careful installation. The clayey subsoil or the slope is a limitation for most sanitary facilities. Slope is the primary limitation if this soil is used for community development and for most recreational purposes. Capability subclass IVe; woodland suitability group 3o.

CeB—Cecil sandy loam, 2 to 6 percent slopes. This deep, well drained, very gently sloping soil is on broad, smooth ridgetops of the Piedmont Upland. Slopes are smooth and convex. Individual areas range from 10 to 150 acres.

In a typical profile the surface layer is reddish brown sandy loam about 5 inches thick. The subsoil is red and extends to a depth of 53 inches. It is clay in the upper part and clay loam in the lower part. The underlying material, to a depth of 72 inches or more, is mottled red and brown saprolite.

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

Included with this soil in mapping are a few small areas of Cecil gravelly sandy loam; a few small areas of Cecil sandy clay loam that is eroded; and a few areas of intermingled Appling, Davidson, and Madison soils. These areas make up about 10 to 20 percent of this map unit.

This soil has good potential for row crops, small grain, and hay and pasture (fig. 4). Good yields can be obtained if proper management is used. Good tilth is easily maintained by returning crop residue to the soil. The hazard of erosion is moderate if cultivated crops are grown. Conservation tillage and the use of cover crops—including grasses and legumes in the cropping system—help to reduce runoff and to control erosion.

This soil has a fair potential for loblolly pine and yellow-poplar. It has no significant limitations for woodland use or management.

This soil has good potential for most urban uses. The slow percolation rate in the subsoil is a limitation for septic tank absorption fields. This limitation can commonly be overcome by good design and careful installation. Capability subclass IIe; woodland suitability group 3o.

CeC—Cecil sandy loam, 6 to 10 percent slopes. This deep, well drained, gently sloping soil is on long, narrow ridgetops and moderately long hillsides of the Piedmont Upland. Slopes are smooth and convex. Individual areas range from 10 to 100 acres.

In a typical profile the surface layer is reddish brown sandy loam about 5 inches thick. The subsoil is red and extends to a depth of 48 inches. It is clay in the upper part and clay loam in the lower part. Below this, to a depth of 72 inches or more, is mottled red and brown saprolite.

This soil is low in both natural fertility and organic-matter content. It is strongly acid or very strongly acid throughout, except where the surface layer has been limed. Permeability is moderate, and available water capacity is medium. Tilth is good, and the soil can be worked throughout a wide range of moisture conditions.

The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few areas of Cecil gravelly sandy loam; a few small areas of Cecil sandy clay loam that is eroded; and a few areas of intermingled Madison, Pacolet, and Gwinnett soils. These areas make up about 10 to 15 percent of this map unit.

This soil has good potential for row crops, small grain, and hay and pasture. Good yields can be obtained if proper management is used. The potential for farming is limited in places, however, by the small size of some areas. Good tilth is easily maintained by returning crop residue to the soil. The hazard of erosion is severe if cultivated crops are grown. Conservation tillage and use of cover crops—including grasses and legumes in the cropping system—help to reduce runoff and to control erosion.

This soil has fair potential for loblolly pine and yellow-poplar. It has no significant limitations for woodland use or management.

This soil has a good potential for most urban uses. The slow rate of percolation in the subsoil is a limitation for septic tank absorption fields. This limitation can be overcome by good design and careful installation. The clayey subsoil is a limitation for most sanitary facilities. Slope is the primary limitation if this soil is used for community development and recreation. Capability subclass IIIe; woodland suitability group 3o.

CeD—Cecil sandy loam, 10 to 15 percent slopes. This deep, well drained, sloping soil is on hillsides of the Piedmont Upland. Slopes are smooth and short. Individual areas range from 10 to 200 acres.

In a typical profile the surface layer is brown sandy loam about 6 inches thick. The subsoil is red and extends to a depth of 50 inches. It is clay in the upper part and clay loam in the lower part. The underlying material, to a depth of 60 inches or more, is mottled red and brown saprolite.

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

Included with this soil in mapping are a few areas of Cecil gravelly sandy loam; a few small areas of Cecil sandy clay loam that is eroded; and a few areas of intermingled Madison, Pacolet, and Gwinnett soils. These areas make up about 10 to 15 percent of this map unit.

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

This soil has fair potential for loblolly pine and yellow-poplar. It has no significant limitations for woodland use or management.

This soil has a fair potential for most urban uses. The slow rate of percolation in the subsoil is a limitation for septic tank absorption fields. This limitation can commonly be overcome by good design and careful installation. The clayey subsoil is a limitation for most sanitary facilities. Slope is the primary limitation if this soil is used for community development and recreation. Capability subclass IVe; woodland suitability group 3o.

CfC2—Cecil sandy clay loam, 6 to 10 percent slopes, eroded. This deep, well drained, gently sloping soil is on narrow ridgetops and moderately long hillsides of the Piedmont Upland. The surface layer is a mixture of soil material from the original surface layer and the upper part of the subsoil. Slopes are convex and contain rills or galled spots, shallow gullies, and an occasional deep gully. Individual areas range from 10 to 150 acres.

In a typical profile the surface layer is red sandy clay loam about 5 inches thick. The subsoil is red. It extends to a depth of 45 inches. It is clay in the upper part and clay loam in the lower part. The underlying material, to a depth of 60 inches or more, is mottled red and brown saprolite.

This soil is low in both natural fertility and organic-matter content. It is strongly acid or very strongly acid throughout, except where the surface layer has been limed. Permeability is moderate, and available water capacity is medium. Tilth is poor. This soil can be worked best if it is not too wet or too dry. Infiltration is slow, and surface runoff is rapid. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few areas of Cecil sandy loam that is not eroded and a few areas of intermingled Madison, Pacolet, and Gwinnett soils. These areas make up about 10 to 15 percent of this map unit.

This soil has poor potential for row crops or small grains, and a fair potential for hay and pasture. The potential for farming is limited by the poor workability of the surface layer and by the gullies.

This soil has fair potential for loblolly pine and shortleaf pine. The hazard of erosion, seedling mortality, and equipment limitations are management concerns. Erosion hazard can be overcome by establishing good ground cover, equipment limitations can be overcome by logging during drier seasons, and seedling mortality can be overcome by planting after good preparation of the soil.

This soil has fair potential for most urban uses. The gullies are a limitation, but the landscape can easily be smoothed or modified for most urban uses. The slow rate of percolation in the subsoil is a limitation for septic tank absorption fields. This limitation can commonly be overcome by good design and careful installation. The clayey subsoil is a limitation for most sanitary facilities. Slope is the primary limitation if this soil is used for community

development and recreation. Capability subclass IVe; woodland suitability group 4c.

CfD2—Cecil sandy clay loam, 10 to 15 percent slopes, eroded. This deep, well drained, sloping soil is on short hillsides of the Piedmont Upland. The surface layer is a mixture of soil material from the original surface layer and the upper part of the subsoil. Slopes are convex and contain rills or galled spots, shallow gullies, and an occasional deep gully. Individual areas range from 10 to 100 acres.

In a typical profile the surface layer is red sandy clay loam about 4 inches thick. The subsoil is red and extends to a depth of 42 inches. It is clay in the upper part and clay loam in the lower part. The underlying material, to a depth of 60 inches or more, is mottled red and brown saprolite.

This soil is low in both natural fertility and organic-matter content. It is strongly acid or very strongly acid throughout, except where the surface layer has been limed. Permeability is moderate, and available water capacity is medium. Tilth is poor. This soil can be worked best if it is not too wet or too dry. Infiltration is slow, and surface runoff is rapid. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few areas of Cecil sandy loam that is not eroded and a few areas of intermingled Madison, Pacolet, and Gwinnett soils. These areas make up about 15 to 20 percent of this map unit.

This soil has poor potential for row crops or small grain, and fair potential for hay and pasture. The potential for farming is limited by the steepness of slope, by the poor workability of the surface layer, and by the gullies.

This soil has fair potential for loblolly pine and shortleaf pine. The hazard of erosion can commonly be overcome by good ground cover. Equipment limitations can be overcome by logging during drier seasons. The limitation of seedling mortality can be overcome by planting after good preparation of the soil.

This soil has fair potential for most urban uses. The gullies are limitations, but the landscape can easily be smoothed or modified for most urban uses. The slow percolation rate in the subsoil is a limitation for septic tank absorption fields. This limitation can commonly be overcome by good design and careful installation. The clayey subsoil is a limitation for most sanitary facilities. Slope is the primary limitation if this soil is used for community development and recreation. Capability subclass VIe; woodland suitability group 4c.

CuC—Cecil-Urban land complex, 2 to 10 percent slopes. This very gently sloping and gently sloping complex consists of Cecil soils and Urban land that are so intermingled they could not be separated at the scale used for mapping. These soils are ridgetops and hillsides of the Piedmont Upland. The mapped areas range from 5 to 500 acres.

Cecil soils make up 50 to 75 percent of each mapped area. In a typical profile the Cecil soils have a reddish brown sandy loam surface layer about 5 inches thick. The subsoil is red and extends to a depth of 48 inches. It is clay in the upper part and clay loam in the lower part. The underlying material, to a depth of 60 inches or more, is mottled red and brown saprolite.

Cecil soils are low in both natural fertility and organic-matter content. These soils are very strongly acid or strongly acid throughout, except where the surface layer has been limed. Permeability is moderate, and available water capacity is medium. Tilth is good, and the soil can be worked throughout a wide range of moisture conditions. The root zone is deep and easily penetrated by plant roots.

Urban land makes up about 20 to 40 percent of each mapped area. The soils have been altered by grading, cutting, filling, shaping, and smoothing for community development. Most Urban land is used for private dwellings, industrial sites, streets and sidewalks, shopping centers, parking lots, and schools and churches.

Included with this unit in mapping are idle areas of Cecil sandy clay loam that is eroded. Most areas of the eroded soils are dissected by shallow gullies. Also included are small areas of intermingled Appling and Madison soils.

This complex has good potential for most urban uses including gardens, shrubs, shade trees, and other kinds of vegetative cover common to the survey area. The slow percolation rate is a limitation for septic tank absorption fields. This limitation can commonly be overcome by good design and careful installation. The common plants used for landscaping and vegetable gardens grow well on these soils. The hazard of erosion, however, is severe prior to establishment of permanent cover. Tilling across the slope and establishing cover crops during the winter help control erosion on areas used for vegetable gardens. Capability subclass IIIe; woodland suitability group 3o.

CuE—Cecil-Urban land complex, 10 to 25 percent slopes. This sloping and moderately steep complex consists of Cecil soils and Urban land that are so intermingled they could not be separated at the scale used for mapping. It is on hillsides of the Piedmont Upland. The mapped areas are 20 to 50 acres.

Cecil soils make up 60 to 75 percent of each mapped area. In a typical profile the Cecil soils have a reddish brown sandy loam surface layer about 5 inches thick. The subsoil is red and extends to a depth of 48 inches. It is clay in the upper part and clay loam in the lower part. The underlying material, to a depth of 60 inches or more, is mottled red and brown saprolite.

Cecil soils are low in both natural fertility and organic-matter content. These soils are very strongly acid or strongly acid throughout, except where the surface layer has been limed. Permeability is moderate, and available water capacity is medium. Tilth is good, and the soil can be worked throughout a wide range of moisture conditions. The root zone is deep and easily penetrated by plant roots.

Urban land makes up about 20 to 30 percent of each mapped area. The soils have been altered by grading, cutting, filling, shaping, and smoothing for community development. Most Urban land is used for private dwellings, industrial sites, streets and sidewalks, shopping centers, parking lots, and schools and churches.

Included with this unit in mapping are idle areas of eroded Cecil sandy clay loam. Most areas of the eroded soils are dissected by shallow gullies. Also included are small areas of intermingled Madison and Pacolet soils.

The soils of this complex have poor potential for most urban uses because they are limited by slope. Also, the slow rate of percolation in the subsoil is a limitation for septic tank absorption fields. In places, this limitation can be overcome to some extent by careful design and construction, or by modifying the slope. The common plants used for landscaping and vegetable gardens grow well on these soils. However, the hazard of erosion is severe prior to establishment of permanent cover. Tilling across the slope and establishing cover crops during the winter help control erosion on areas used for vegetable gardens. Capability subclass VIe; woodland suitability group 3r.

DgB—Davidson loam, 2 to 6 percent slopes. This deep, well drained, very gently sloping soil is on broad ridgetops of the Piedmont Upland. Slopes are smooth and convex. Individual areas range from 10 to 50 acres.

In a typical profile the surface layer is dark reddish brown loam 7 inches thick. The subsoil is dark red clay. It extends to a depth of 65 inches or more.

This soil is low in both natural fertility and organic-matter content. It is medium acid or strongly acid throughout, except where the surface layer has been limed. Permeability is moderate, and available water capacity is medium. Tilth is good. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Davidson clay loam that is eroded and small areas of Cecil and Gwinnett soils. These areas make up 15 to 20 percent of this map unit.

This soil has good potential for row crops, small grain, and hay and pasture. Good tilth is easily maintained by returning crop residue to the soil. The hazard of erosion is moderate if cultivated crops are grown. Conservation tillage and the use of cover crops—including grasses and legumes in the cropping system—help to reduce runoff and to control erosion.

This soil has fair potential for loblolly pine and yellow-poplar. It has no significant limitations for woodland use or management.

This soil has good potential for most urban uses. The slow rate of percolation in the subsoil is a limitation for septic tank absorption fields. This limitation can commonly be overcome by good design and careful installation. Capability subclass IIe; woodland suitability group 3o.

GwC2—Gwinnett sandy clay loam, 6 to 10 percent slopes, eroded. This deep, well drained, gently sloping soil is on ridgetops and hillsides of the Piedmont Upland. The surface layer is a mixture of soil material from the original surface layer and the upper part of the subsoil. Slopes are convex and contain rills or galled spots, shallow gullies, and an occasional deep gully. Individual areas range from 10 to 100 acres.

In a typical profile the surface layer is dark reddish brown sandy clay loam about 4 inches thick. The subsoil is dark red clay. It extends to a depth of 36 inches. Below this, to a depth of 45 inches or more, is weathered dark colored fractured rock.

This soil is low in both natural fertility and organic-matter content. It is medium acid or strongly acid throughout, except where the surface layer has been limed. Permeability is moderate, and available moisture capacity is medium. Tilth is poor. Because of the high clay content in the surface layer, tillage can best be performed when the soil is reasonably dry. Infiltration is slow, and surface runoff is rapid. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few areas of Cecil, Davidson, Musella, and Pacolet. These areas make up less than 15 percent of this map unit.

This soil has poor potential for row crops and small grain. The potential for farming is limited by the small size of some areas, by the severe hazard of erosion, and by the gullies. This soil has fair potential for hay and pasture. Tilth can be improved by returning crop residue to the soil. Conservation tillage and the use of cover crops—including grasses and legumes in the cropping system—help to reduce runoff and to control erosion.

This soil has fair potential for loblolly pine. The hazard of erosion, equipment limitations, and seedling mortality are management problems. These problems can be overcome, to some extent, by good management.

This soil has fair potential for most urban uses. Slope is the main limitation if this soil is used for sanitary facilities, community development, or recreation. Capability subclass IVe; woodland suitability group 4c.

GwD2—Gwinnett sandy clay loam, 10 to 15 percent slopes, eroded. This deep, well drained, sloping soil is on hillsides of the Piedmont Upland. The surface layer is a mixture of soil material from the original surface layer and the upper part of the subsoil. Slopes are convex and contain rills and galled spots, shallow gullies, and an occasional deep gully. Individual areas range from 10 to 50 acres.

In a typical profile the surface layer is dark reddish brown sandy clay loam about 4 inches thick. The subsoil is dark red clay. It extends to a depth of 29 inches. Below this, to a depth of 45 inches or more, is weathered dark colored fractured rock.

This soil is low in both natural fertility and organic-matter content. It is medium acid or strongly acid throughout, except where the surface layer has been limed. Permeability is moderate, and available moisture capacity is medium. Tilth is poor because of erosion. Infiltration is

slow, and surface runoff is rapid. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few areas of Cecil, Davidson, Musella, and Pacolet soils. These areas make up about 20 percent of this map unit.

This soil has poor potential for row crops and small grain. The potential for farming is limited by the slope, by the severe hazard of erosion, and by the gullies. It has fair potential for hay and pasture if management is good.

This soil has fair potential for loblolly pine. The hazard of erosion, equipment limitations, and seedling mortality are management problems. These problems can be overcome, to some extent, by good management.

This soil has fair potential for most urban uses. Slope is the main limitation for most urban and recreation uses. Capability subclass VIe; woodland suitability group 4c.

HyB—Helena sandy loam, 2 to 6 percent slopes. This moderately well drained, very gently sloping soil is on low side slopes of the Piedmont Upland. Slopes are smooth and convex. Individual areas range from 5 to 50 acres.

In a typical profile the surface layer is yellowish brown sandy loam about 6 inches thick. The subsoil extends to a depth of 24 inches. It is predominantly yellowish brown sandy clay and is mottled with gray in the lower part. The lower part of the subsoil is plastic. Below this, to a depth of 62 inches or more, is light olive gray weathered granite and gneiss.

This soil is low in both natural fertility and organic-matter content. It is strongly acid or very strongly acid throughout, except where the surface layer has been limed. Permeability is slow, and available water capacity is medium. This soil commonly has a perched water table at a depth of 12 to 30 inches from January through March. Tilth is good. The root zone is somewhat limited because of the firm, plastic subsoil.

Included with this soil in mapping are a few areas of soils that have a gravelly sandy loam surface layer, a few areas of Appling soils, and areas of soils that have a solum more than 40 inches thick. These areas make up about 10 to 15 percent of this map unit.

This soil has fair potential for row crops and small grain. The potential for farming is limited by the small size of some areas and by the seasonally high water table, which delays spring planting in some places. This soil has good potential for hay and pasture. Good tilth is easily maintained by returning crop residue to the soil. The hazard of erosion is moderate if cultivated crops are grown. Conservation tillage and the use of cover crops—including grasses and legumes in the cropping system—help to reduce runoff and to control erosion.

This soil has fair potential for yellow-poplar and loblolly pine. Wetness is the main equipment limitation while managing and harvesting the tree crop. This limitation can be overcome by logging during the drier seasons.

This soil has poor potential for most urban uses. The clayey and plastic subsoil has a slow percolation rate. Also, seasonal wetness and shrink-swell potential are limitations that are difficult to overcome. The hazard of erosion is moderate prior to the establishment of vegetative cover. Capability subclass IIe; woodland suitability group 3w.

HyC—Helena sandy loam, 6 to 10 percent slopes. This moderately well drained, gently sloping soil is on low side slopes of the Piedmont Upland. Slopes are smooth and convex. Individual areas range from 10 to 20 acres.

In a typical profile the surface layer is dark grayish brown sandy loam about 6 inches thick. The subsoil is predominantly yellowish brown and extends to a depth of 32 inches. It is sandy clay loam in the upper few inches, sandy clay in the middle part, and sandy clay that has gray mottles in the lower part. The middle and lower part of the subsoil is firm and plastic. Below this, to a depth of 60 inches or more, is gray weathered granite and gneiss.

This soil is low in both natural fertility and organic-matter content. It is strongly acid or very strongly acid throughout, except where the surface layer has been limed. Permeability is slow, and available water capacity is medium. This soil commonly has a perched water table at a depth of 12 to 30 inches from January through March. Tilth is good. The root zone is somewhat limited because of the firm, plastic subsoil.

Included with this soil in mapping are a few small areas that have a gravelly sandy loam surface layer, a few small areas of Helena sandy clay loam that is eroded, a few areas of Appling soils, and areas of soils that have a solum more than 40 inches thick. These areas make up about 10 to 15 percent of this map unit.

This soil has poor potential for row crops and small grain. The potential for farming is limited by the small size of some areas and by the seasonally high water table, which delays spring planting in some places. This soil has fair potential for hay and pasture. Good tilth is easily maintained by returning crop residue to the soil. The hazard of erosion is moderate if cultivated crops are grown. Conservation tillage and the use of cover crops—including grasses and legumes in the cropping system—help to reduce runoff and to control erosion.

This soil has fair potential for yellow-poplar and loblolly pine. Wetness is the main equipment limitation while managing and harvesting the tree crop. This limitation can be overcome by logging during the drier seasons.

This soil has poor potential for most urban uses. The clayey, plastic subsoil has a slow percolation rate. Also, seasonal wetness and shrink-swell potential are limitations that are difficult to overcome. Slope causes a severe hazard of erosion prior to the establishment of vegetative cover. Capability subclass IIIe; woodland suitability group 3w.

LoD—Louisa gravelly fine sandy loam, 6 to 15 percent slopes. This shallow, somewhat excessively drained, gently sloping or sloping soil is on narrow ridgetops and short hillsides of the Piedmont Upland. Slopes are short and convex. Individual areas range from 10 to 100 acres.

In a typical profile the surface layer is brown gravelly fine sandy loam about 5 inches thick. The subsoil is yellowish red gravelly loam interrupted in short horizontal distances by clay loam. It extends to a depth of 16 inches. Below this, to a depth of 84 inches or more, is tilted layers of weathered gray mica schist.

This soil is low in both natural fertility and organic-matter content. It is medium acid or strongly acid throughout, except where the surface layer has been limed. Permeability is moderately rapid, and available water capacity is low. Tilth is good. The root zone is shallow.

Included with this soil in mapping are a few areas of Louisa gravelly loam and a few areas of Madison soils. These areas make up 20 to 25 percent of this map unit.

This soil has poor potential for row crops. The potential for farming is limited by the small size of some areas and by the shallow root zone. This soil has fair potential for hay and pasture.

This soil has fair potential for loblolly pine. It has no significant limitations for woodland use or management.

This soil has poor potential for most urban uses. Slope is the main limitation for most urban and recreational uses. Capability subclass VIe; woodland suitability group 4o.

LoF—Louisa gravelly fine sandy loam, 15 to 40 percent slopes. This shallow, somewhat excessively drained, moderately steep and steep soil is on hillsides of the Piedmont Upland. Slopes are short and convex and are dissected by numerous drainageways. Individual areas range from 25 to 500 acres.

In a typical profile the surface layer is mainly dark yellowish brown gravelly fine sandy loam about 5 inches thick. The subsoil is brown gravelly loam interrupted in short horizontal distances by clay loam. It extends to a depth of about 16 inches. Below this, to a depth of 84 inches or more, are tilted layers of weathered gray mica schist.

This soil is low in both natural fertility and organic-matter content. It is medium acid or strongly acid throughout. Permeability is moderately rapid, and available water capacity is low. Tilth is good. The root zone is shallow.

Included with this soil in mapping are a few areas of Louisa gravelly loam and a few areas of Madison soils. These areas make up 15 to 20 percent of this map unit.

This soil is mostly wooded. It has fair potential for loblolly pine (fig. 5). The hazard of erosion and equipment limitation are concerns, but good management can help overcome these limitations.

This soil has poor potential for farming and urban uses. The shallow root zone and moderately steep and steep slopes are limitations if this soil is used for farming. Slope is the main limitation for urban and recreational uses. Capability subclass VIIe; woodland suitability group 4r.

MdB—Madison gravelly sandy loam, 2 to 6 percent slopes. This deep, well drained, very gently sloping soil is on broad ridgetops of the Piedmont Upland. Slopes are smooth and convex. Individual areas range from 5 to 50 acres.

In a typical profile the surface layer is brown gravelly sandy loam about 5 inches thick. The subsoil is predominantly red and extends to a depth of about 38 inches. It is sandy clay loam in the upper few inches, clay in the middle part, and clay loam in the lower part. Below this, to a depth of 52 inches or more, is weathered mica schist.

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

Included with this soil in mapping are a few areas of Madison gravelly sandy clay loam and a few areas of Cecil soils. These areas make up less than 10 percent of this unit.

This soil has good potential for row crops, small grain, and hay and pasture. The potential for farming, however, is somewhat limited by the small size of some areas. Good tilth is easily maintained by returning crop residue to the soil. The hazard of erosion is moderate if cultivated crops are grown. Conservation tillage and the use of cover crops—including grasses and legumes in the cropping system—help to reduce runoff and to control erosion.

This soil has fair potential for loblolly pine and yellow-poplar. It has no significant limitations for woodland use or management.

This soil has a good potential for most urban uses. The slow rate of percolation in the subsoil is a limitation for septic tank absorption fields. This limitation can commonly be overcome by good design and careful installation. Low strength is a limitation if this soil is used for local roads and streets. Capability subclass IIe; woodland suitability group 3o.

MdC—Madison gravelly sandy loam, 6 to 10 percent slopes. This deep, well drained, gently sloping soil is on ridgetops and hillsides of the Piedmont Upland. Slopes are smooth and convex. Individual areas range from 10 to 100 acres.

In a typical profile the surface layer is brown gravelly sandy loam about 5 inches thick. The subsoil is red and extends to a depth of about 25 inches. It is clay in the upper part and clay loam in the lower part. The underlying material, to a depth of 52 inches or more, is weathered mica schist.

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

Included with this soil in mapping are a few areas of Madison gravelly sandy clay loam and a few areas of Cecil soils. These areas make up 10 to 15 percent of this map unit.

This soil has good potential for row crops, small grain, and hay and pasture. The potential for farming, however, is somewhat limited by the small size of some areas. The hazard of erosion is moderate if cultivated crops are grown. Conservation tillage and use of cover crops—including grasses and legumes in the cropping system—help to reduce runoff and to control erosion. Good tilth is easily maintained by returning crop residue to the soil.

This soil has fair potential for loblolly pine and yellow-poplar. It has no significant limitations for woodland use or management.

This soil has fair potential for most urban uses. The slow rate of percolation in the subsoil is a limitation for septic tank absorption fields. This limitation can be overcome by good design and careful installation. Slope is commonly a limitation for most urban and recreational uses. This limitation can commonly be overcome by careful design and construction or by modifying the slope. Low strength is a limitation for most urban development. Capability subclass IIIe; woodland suitability group 3o.

MdE—Madison gravelly sandy loam, 15 to 25 percent slopes. This deep, well drained, moderately steep soil is on hillsides adjacent to drainageways of the Piedmont Upland. Slopes are smooth and convex. Individual areas range from 25 to 500 acres.

In a typical profile the surface layer is brown gravelly sandy loam about 6 inches thick. The subsoil is predominantly red and extends to a depth of about 40 inches. It is sandy clay loam in the upper few inches, clay in the middle part, and clay loam in the lower part. Below this, to a depth of 52 inches or more, is weathered mica schist.

This soil is low in both natural fertility and organic-matter content. It is strongly acid or very strongly acid throughout, except where the surface layer has been limed. Permeability is moderate, and available water capacity is medium. Tilth is good. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few areas of Madison gravelly sandy clay loam and small areas of Louisa and Pacolet soils. These areas make up 20 to 25 percent of this map unit.

This soil has poor potential for row crops and small grain. The potential for farming is limited by the slope. This soil has fair potential for hay and pasture if management is good.

This soil has fair potential for loblolly pine and yellow-poplar. The hazard of erosion and equipment limitations are management concerns. These limitations can be overcome, to some extent, by good management.

This soil has poor potential for most urban uses. The moderately steep slopes are the main limitation for most urban and recreational uses. Capability subclass VIe; woodland suitability group 3r.

MfC2—Madison gravelly sandy clay loam, 6 to 10 percent slopes, eroded. This deep, well drained, gently sloping soil is on ridgetops and hillsides of the Piedmont Upland. The surface layer is a mixture of soil material from the original surface layer and the upper part of the subsoil. Slopes are convex and contain rills or galled spots, shallow gullies, and an occasional deep gully. Individual areas range from 10 to 50 acres.

In a typical profile the surface layer is reddish brown gravelly sandy clay loam about 5 inches thick. The subsoil is red and extends to a depth of 36 inches. It is clay in the upper part and clay loam in the lower part. Below this, to a depth of 52 inches or more, is weathered mica schist.

This soil is low in both natural fertility and organic-matter content. It is strongly acid or very strongly acid throughout, except where the surface layer has been limed. Permeability is moderate, and available water capacity is medium. Tilth is poor because of erosion. Infiltration is slow, and surface runoff is rapid. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of Madison gravelly sandy loam, a few small areas of severely eroded soils, and a few areas of intermingled Cecil and Pacolet soils. These areas make up about 20 to 25 percent of this map unit.

This soil has fair potential for row crops, small grain, and hay and pasture. The potential for farming is limited by the small size of some areas, by the gullies, and by the severe hazard of erosion. Tilth can be improved by returning crop residue to the soil. Conservation tillage and use of cover crops—including grasses and legumes in the cropping system—help to reduce runoff and to control erosion.

This soil has fair potential for loblolly pine and yellow-poplar. The hazard of erosion, equipment limitations, and seedling mortality are management concerns. These limitations can be overcome, to some extent, by good management.

This soil has fair potential for most urban uses. The slow rate of percolation in the subsoil is a limitation for septic tank absorption fields. This limitation can be overcome by good design and careful installation. Slope is commonly a limitation for urban and recreational uses. This limitation can commonly be overcome by careful design and construction or by modifying the slope. Low strength is a limitation for most community development. Capability subclass IVe; woodland suitability group 4c.

MfD2—Madison gravelly sandy clay loam, 10 to 15 percent slopes, eroded. This deep, well drained, sloping soil is on hillsides of the Piedmont Upland. The surface layer is a mixture of soil material from the original surface layer and the upper part of the subsoil. Slopes are convex and contain rills or galled spots, shallow gullies, and an occasional deep gully. Individual areas range from 20 to 200 acres.

In a typical profile the surface layer is reddish brown, predominantly gravelly sandy clay loam about 5 inches

thick. The subsoil is red and extends to a depth of 36 inches. It is clay in the upper part and clay loam in the lower part. Below this, to a depth of 52 inches or more, is weathered mica schist.

This soil is low in both natural fertility and organic-matter content. It is strongly acid or very strongly acid throughout, except where the surface layer has been limed. Permeability is moderate, and available water capacity is medium. Tilth is poor because of erosion. Infiltration is slow, and surface runoff is rapid. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few small areas of severely eroded soils; several areas of Madison gravelly sandy loam; and a few small areas of Cecil, Louisa, and Pacolet soils. These areas make up 10 to 15 percent of this map unit.

This soil has poor potential for row crops and small grain. The potential for farming is limited by the slope, by the gullies, and by the severe hazard of erosion. This soil has fair potential for hay and pasture if management is good.

This soil has fair potential for loblolly pine and yellow-poplar. The hazard of erosion, equipment limitations, and seedling mortality are management concerns. These limitations can be overcome, to some extent, by good management.

This soil has fair potential for most urban uses. The slow rate of percolation in the subsoil is a limitation for septic tank absorption fields. This limitation can be overcome by good design and careful installation. Slope is commonly a limitation for urban and recreational uses. This limitation generally can be overcome by careful design and construction or by modifying the slope. Low strength is a limitation for most community development. Capability subclass VIe; woodland suitability group 4c.

MuC—Madison-Urban land complex, 2 to 10 percent slopes. This very gently sloping and gently sloping complex consists of Madison soils and Urban land that are so intermingled they could not be separated at the scale used for mapping. The soils are on smooth ridgetops and hillsides of the Piedmont Upland. Individual areas range from 100 to 500 acres.

Madison soils make up about 60 percent of each mapped area. In a typical profile the surface layer is brown gravelly sandy loam about 5 inches thick. The subsoil is red and extends to a depth of 38 inches. It is sandy clay loam in the upper few inches, clay in the middle part, and clay loam in the lower part. Below this, to a depth of 52 inches or more, is weathered mica schist.

This soil is low in both natural fertility and organic-matter content. It is strongly acid or very strongly acid throughout. Permeability is moderate, and available water capacity is medium. Tilth is good. The root zone is deep and easily penetrated by plant roots.

Urban land makes up about 40 percent of each mapped area. The soils have been altered by cutting, filling, and shaping for community development. Most urban land is used for shopping centers, schools, parking lots, industrial sites, streets, commercial buildings, and residences.

Included with this unit in mapping are idle areas of Madison sandy clay loam that is eroded. Most of these areas of eroded soils are dissected by shallow gullies. Also included are small areas of intermingled Cecil and Louisa soils.

This complex has high potential for most urban uses including gardens, shrubs, shade trees, and other kinds of vegetative cover common to the survey area. The slow rate of percolation is a limitation for septic tank absorption fields, but this limitation can commonly be overcome by good design and careful installation. The common plants used for landscaping and vegetable gardens grow well on these soils. The hazard of erosion is severe, however, prior to establishment of permanent cover. Tilling across the slope and establishing cover crops during the winter help control erosion on areas used for vegetable gardens. Capability subclass IIIe; woodland suitability group 3o.

MuE—Madison-Urban land complex, 10 to 25 percent slopes. This sloping and moderately steep complex consists of Madison soils and Urban land that are so intermingled they could not be separated at the scale used for mapping. It is on hillsides of the Piedmont Upland. Some areas contain rills and galled spots, shallow gullies, and an occasional deep gully. Individual areas range from 10 to 75 acres.

Madison soils make up about 75 percent of each mapped area. In a typical profile the surface layer is reddish brown gravelly sandy clay loam about 5 inches thick. The subsoil is red and extends to a depth of about 36 inches. It is clay in the upper part and clay loam in the lower part. Below this, to a depth of 52 inches or more, is weathered mica schist.

This soil is low in both natural fertility and organic-matter content. It is strongly acid or very strongly acid throughout. Permeability is moderate, and available water capacity is medium. Tilth is poor because of erosion. Infiltration is slow, and surface runoff is rapid. The root zone is deep and easily penetrated by plant roots.

Urban land makes up about 25 percent of each mapped area. The soils have been altered by cutting, filling, and shaping for residences and streets.

Included with this unit in mapping are areas of Madison sandy loam and small areas of intermingled Cecil and Louisa soils.

This complex has poor potential for most urban and recreational uses because of slope. Also, the slow rate of percolation in the subsoil is a limitation for septic tank absorption fields. In places, these limitations can be overcome, to some extent, by careful design and construction, or by modifying the slope. The hazard of erosion is severe prior to establishment of permanent cover. Tilling across the slope and establishing cover crops during the winter help control erosion on areas used for vegetable gardens. Capability subclass VIe; woodland suitability group 3r.

MvC2—Musella clay loam, 6 to 10 percent slopes, eroded. This shallow, well drained, gently sloping soil is on narrow ridgetops of the Piedmont Upland. The surface layer is a mixture of soil material from the original surface layer and the upper part of the subsoil. Slopes are convex and contain rills or galled spots, shallow gullies, and an occasional deep gully. Individual areas range from 10 to 20 acres.

In a typical profile the surface layer is dark reddish brown clay loam about 3 inches thick. The subsoil is dark red clay loam. It extends to a depth of 18 inches. Below this, to a depth of 60 inches or more, is dark colored fractured rock.

This soil is low in both natural fertility and organic-matter content. It is slightly acid to strongly acid throughout. Permeability is moderate, and available water capacity is medium. Tilth is poor. Because of the high clay content in the surface layer, tillage can best be performed when the soil is reasonably dry. Infiltration is slow, and surface runoff is rapid. The root zone is shallow.

Included with this soil in mapping are a few stony areas of less than one-fourth of an acre and a few small areas of Gwinnett soils. These areas make up less than 15 percent of this map unit.

This soil has poor potential for row crops. The potential for farming is limited by the small size of most areas and by the shallow root zone. The soil has fair potential for hay and pasture.

This soil has fair potential for loblolly pine and yellow-poplar. It has no significant limitations for woodland use or management.

This soil has poor potential for most urban uses. Depth to rock is the main limitation if sanitary facilities are installed or community development is planned. The surface layer is too clayey and needs consideration if recreational areas are developed. Capability subclass IVe; woodland suitability group 3o.

MwE—Musella stony clay loam, 10 to 25 percent slopes. This shallow, well drained, sloping and moderately steep soil is on narrow ridgetops and on hillsides of the Piedmont Upland. Slopes are short and convex and are dissected by numerous drainageways. Individual areas range from 10 to 50 acres.

In a typical profile the surface layer is dark reddish brown clay loam about 5 inches thick. It is stony in the upper few inches and gravelly in the lower part. The subsoil is dark red gravelly clay loam. It extends to a depth of 18 inches. Below this, to a depth of 60 inches or more, is dark colored fractured rock.

This soil is low in both natural fertility and organic-matter content. It is slightly acid to strongly acid throughout. Permeability is moderate, and available water capacity is medium. Tilth is only fair because of the high clay content in the surface layer. Also, workability is difficult because of the stones and gravel in the surface layer. The root zone is shallow.

Included with this soil in mapping are small areas of Musella gravelly loam and a few areas of interminged Gwinnett, Pacolet, and Wilkes soils. These areas make up about 10 to 15 percent of this map unit.

This soil is mostly wooded. It has fair potential for loblolly pine. Equipment limitations and seedling mortality are management concerns.

This soil has poor potential for farming and urban uses. The stony surface layer, shallow depth to rock, and sloping or moderately steep slopes are limitations if this soil is used for farming, urban development, and recreation. Capability subclass VIIe; woodland suitability group 4x.

PgC2—Pacolet sandy clay loam, 6 to 10 percent slopes, eroded. This deep, well drained, gently sloping soil is on narrow ridgetops and short hillsides of the Piedmont Upland. The surface layer is a mixture of soil material from the original surface layer and the upper part of the subsoil. Slopes are convex and contain rills or galled spots, shallow gullies, and an occasional deep gully. Individual areas range from 5 to 25 acres.

In a typical profile the surface layer is reddish brown sandy clay loam about 4 inches thick. The subsoil is red and extends to a depth of about 25 inches. It is sandy clay loam in the upper few inches, clay in the middle part, and clay loam in the lower part. Below this, to a depth of 60 inches or more, is weathered granite, gneiss, and mica schist.

This soil is low in both natural fertility and organic-matter content. It is medium acid to very strongly acid throughout, except where the surface layer has been limed. Permeability is moderate, and available water capacity is medium. Tilth is poor. Because of the high clay content in the surface layer, tillage can best be performed when the soils are reasonably dry. Infiltration is slow, and surface runoff is rapid. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are a few areas of Pacolet gravelly sandy loam, a few small areas of Cecil and Wedowee soils, and a few areas of less than one-fourth acre where the soil has many stones and boulders on the surface. Areas of rock outcrop are included and are indicated on the soil map by a symbol. A few rock outcrops that were not observed in mapping can be expected and are also included areas. These areas make up about 10 to 15 percent of this map unit.

This soil has poor potential for row crops and small grain. The potential for farming is limited by the small size of the areas, by the gullies, and by the severe hazard of erosion. This soil has fair potential for hay and pasture. Conservation tillage and the use of cover crops—including grasses and legumes in the cropping system—reduce runoff and help control erosion. Tilth can be improved by returning crop residue to the soil.

This soil has fair potential for loblolly pine and yellow-poplar. The hazard of erosion, equipment limitations, and seedling mortality are management concerns. These limi-

tations can be overcome, to some extent, by good management.

This soil has fair potential for most urban uses. The slow rate of percolation in the subsoil is a limitation for septic tank absorption fields. This limitation can be overcome by good design and construction. This soil is limited for most sanitary facilities, community development, or recreational uses by slope or by a high clay content. Capability subclass IVe; woodland suitability group 4c.

PgD2—Pacolet sandy clay loam, 10 to 15 percent slopes, eroded. This deep, well drained, sloping soil is on short hillsides of the Piedmont Upland. The surface layer is a mixture of soil material from the original surface layer and the upper part of the subsoil. Slopes are convex and contain rills and galled spots, shallow gullies, and an occasional deep gully. Individual areas range from 20 to 200 acres.

In a typical profile the surface layer is reddish brown sandy clay loam about 2 inches thick. The subsoil is red and extends to a depth of 28 inches. It is clay in the upper part and clay loam in the lower part. Below this, to a depth of 60 inches or more, is weathered granite, gneiss, and mica schist.

This soil is low in both natural fertility and organic-matter content. It is medium acid to very strongly acid throughout, except where the surface layer has been limed. Permeability is moderate, and available water capacity is medium. Tilth is poor. Because of the high clay content in the surface layer, tillage can best be performed when the soils are reasonably dry. Infiltration is slow, and surface runoff is rapid. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are small areas of Pacolet gravelly sandy loam; a few areas of intermingled Cecil, Madison, and Wedowee soils; and areas of less than one-fourth acre where the soil has large stones and boulders on the surface. Areas of rock outcrop are included and are indicated on the soil map by a symbol. A few rock outcrops that were not observed in mapping can be expected and are also included areas. These areas make up about 15 to 20 percent of this map unit.

This soil has poor potential for row crops and small grain. The potential for farming is limited by the slope, by the gullies, and by the severe hazard of erosion. This soil has fair potential for hay and pasture if management is good.

This soil has fair potential for loblolly pine and yellow-poplar. The hazard of erosion, equipment limitations, and seedling mortality are management concerns. These limitations can be overcome, to some extent, by good management.

This soil has fair potential for most urban uses. The slow rate of percolation in the subsoil is a limitation for septic tank absorption fields. This limitation can be overcome by good design and construction. This soil is limited for most sanitary facilities, community development, or recreational uses by slope or by high clay content. Capability subclass VIe; woodland suitability group 4c.

PgE2—Pacolet sandy clay loam, 15 to 25 percent slopes, eroded. This deep, well drained, moderately steep soil is on hillsides of the Piedmont Upland. The surface layer is a mixture of soil material from the original surface layer and the upper part of the subsoil. Slopes are convex and dissected by numerous drainageways. They contain rills or galled spots, shallow gullies, and an occasional deep gully. Individual areas range from 25 to 500 acres.

In a typical profile the surface layer is brown sandy clay loam about 2 inches thick. The subsoil extends to a depth of 28 inches. It is yellowish red sandy clay loam in the upper part, red clay in the middle part, and yellowish red clay loam in the lower part. Below this, to a depth of 60 inches or more, is yellowish red saprolite.

This soil is low in both natural fertility and organic-matter content. It is medium acid to very strongly acid throughout, except where the surface layer has been limed. Permeability is moderate, and available water capacity is medium. Tilth is poor because of erosion. Infiltration is slow, and surface runoff is rapid. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are small areas of Pacolet gravelly sandy loam; a few areas of intermingled Cecil, Madison, and Wedowee soils; and areas of less than one-fourth acre where the soil has many stones and boulders on the surface. Areas of rock outcrop are included and are indicated on the soil map by a symbol. A few rock outcrops that were not observed in mapping can be expected and also are included areas. These areas make up about 20 to 30 percent of this map unit.

This soil has fair potential for loblolly pine and yellow-poplar (fig. 6). The hazard of erosion, equipment limitations, and seedling mortality are management concerns.

This soil has poor potential for farming and urban uses. The moderately steep slope and severe hazard of erosion are limitations if the soil is used for farming. Slope is the main limitation for urban and recreational uses. Capability subclass VIe; woodland suitability group 4c.

PhE3—Pacolet-Udorthents complex, gullied. This moderately steep complex consists of Pacolet soils and Udorthents that are so intermingled that they could not be separated at the scale used for mapping. The soils of this complex are well drained and are on hillsides of the Piedmont Upland. The landscape is a network of deep gullies. In places, the gullies extend through the entire soil into the underlying material. Truncated areas of Pacolet soils are between the gullies. Individual areas range from 5 to 15 acres.

Pacolet soils make up about 55 percent of each mapped area. In a typical profile the surface layer and subsoil are red clay or clay loam about 24 inches thick. Below this, to a depth of 60 inches or more, is mottled red and brown saprolite.

Pacolet soils are low in both natural fertility and organic-matter content. They are medium acid to very strongly acid throughout. Permeability is moderate, and available water capacity is medium. Infiltration is slow, and surface runoff is rapid.

Udorthents make up about 45 percent of each mapped area. Typically gullies are in the area and, in places, extend in depth into the underlying saprolite material.

Included with this unit in mapping are areas of Cecil sandy clay loam and several areas where soil is less than 20 inches thick over the saprolite.

This unit has poor potential for most uses. The majority of the area is occupied by scattered, low quality pine trees; some of the area is barren of vegetation. Major reclamation by filling, leveling, and smoothing help overcome the irregular configuration of the landscape. Some places can be used for community and recreational development if the landscape is smoothed and the slope is modified by good design and careful installation, which is based on the characteristics of the altered soil material. Capability subclass VIIe; Pacolet part in woodland suitability group 4c, woodland suitability group not assigned to Udorthents part.

PUF—Pacolet soils, 15 to 40 percent slopes. These deep, well drained to excessively drained, moderately steep or steep soils are on narrow ridgetops and hillsides of the Piedmont Upland. Areas of Pacolet soils and areas of loamy soils underlain by hard bedrock commonly at a depth of below 50 inches are in an irregular pattern on the landscape. Individual areas of each soil are large enough to map separately, but because of present and predicted use, they were mapped as one unit. Most mapped units contain both soils, but a few contain only one of the soils.

About 65 percent of the map unit is Pacolet soils. In a typical profile the surface layer is dark grayish brown sandy loam about 6 inches thick. The subsoil extends to a depth of about 33 inches. It is yellowish red sandy clay loam in the upper few inches, red clay in the middle part, and yellowish red sandy clay loam in the lower part. Below this, to a depth of 60 inches or more, is weathered granite, gneiss, and mica schist.

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

About 30 percent of the map unit is soils that are loamy and have hard bedrock commonly at a depth of below 50 inches.

These loamy soils are low in both natural fertility of organic—matter content. They are medium acid to very strongly acid throughout. Permeability is rapid, and available water capacity is low. Tilth is good. The root zone is deep and easily penetrated by plant roots.

Included with these soils in mapping are small areas of Pacolet gravelly sandy loam, a few areas of Wedowee soils, and areas of less than one-fourth acre where the soil has many stones and boulders on the surface. Areas of rock outcrop are included and are indicated on the soil map by a symbol. A few rock outcrops that were not observed in mapping can be expected and are also included. These areas make up about 5 to 10 percent of this map unit.

This map unit is wooded. It has fair potential for loblolly pine and yellow-poplar. The hazard of erosion and equipment limitations are concerns, but good management can help overcome these limitations.

This map unit has poor potential for farming and urban uses. The moderately steep and steep slope and the severe hazard of erosion are limitations if this soil is used for farming. Slope is the main limitation for urban and recreational uses. Capability subclass VIIe; woodland suitability group 3r.

Rh—Riverview loam. This deep, well drained, nearly level soil is on flood plains near creeks and rivers and in depressions on uplands. Probability of brief flooding during winter and early in spring is high. Slopes are 0 to 2 percent. Individual areas range from 5 to 100 acres.

In a typical profile the surface layer is brown loam about 5 inches thick. The subsoil is predominantly dark yellowish brown silty clay loam. It extends to a depth of 34 inches. Below this, to a depth of 65 inches or more, is predominantly dark brown loamy coarse sand.

This soil is low in both natural fertility and organic-matter content. It is strongly acid or very strongly acid throughout, except where the surface layer has been limed. Permeability is moderate, and available water capacity is medium. Tilth is good. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are areas where the soil is sandy throughout the profile; areas where the soils are similar but have surface layer and subsoil more than 40 inches thick; and areas where the soils are similar but have a sandy loam surface layer. These areas make up about 40 percent of this map unit. Wet spots are indicated on the soil map by symbol.

This soil has good potential for row crops and hay and pasture. The potential for farming is somewhat limited, however, by the small size of some areas. Flooding is a concern for the period beginning late in winter and ending early in spring. Good tilth is easily maintained by returning crop residue to the soil.

This soil has good potential for loblolly pine and yellow-poplar. It has no significant limitations for woodland use and management.

This soil has poor potential for most urban uses. Flooding is the main limitation. This limitation can only be overcome by using major flood control measures. Capability subclass IIw; woodland suitability group 1o.

RK—Riverview-Chewacla association. This map unit consists of nearly level soils on flood plains. Areas are in a regular, repeating pattern. They are made up of well drained Riverview soils on natural levees adjacent to stream channels and somewhat poorly drained Chewacla

soils in lower areas adjacent to the uplands. These soils formed in loamy sediment. The mapped areas are mostly long and narrow and are 25 to 500 acres in size. Individual areas of Riverview or Chewacla soils range from 2 to 50 acres. Slopes are 0 to 2 percent.

The well drained Riverview soils make up about 45 percent of the map unit. In a typical profile the surface layer is brown loam about 5 inches thick. The subsoil, to a depth of about 29 inches, is brown silty clay loam. Beneath the subsoil, to a depth of 65 inches or more, is dark brown loamy coarse sand.

Riverview soils are low in natural fertility and organic-matter content. They are strongly acid or very strongly acid throughout, except where the surface layer has been limed. Permeability is moderate, and available water capacity is medium. Tilth is good. The root zone is deep. The water table is commonly within 36 to 60 inches of the surface during winter and the early part of spring. The probability of brief flooding during this period is high.

The somewhat poorly drained Chewacla soil makes up about 40 percent of the map unit. In a typical profile the surface layer is dark brown loam about 8 inches thick. The subsoil extends to a depth of 65 inches or more. It is brown loam that has grayish brown mottles in the upper part, and gray silty clay loam that has strong brown mottles in the lower part.

Chewacla soils are low in natural fertility and organic-matter content. They are medium acid or strongly acid throughout, except where the surface layer had been limed. Permeability is moderate, and available water capacity is medium. Tilth is good. The root zone is deep. The water table is commonly within 6 to 18 inches of the surface during winter and in the early part of spring. Probability of brief flooding during this period is high.

Included with these soils in mapping are small areas of Roanoke soils. Areas of soils that are similar to Chewacla but are not so well drained are also included. The areas make up about 5 percent of the map unit.

The soils in this unit have fair potential for farming. They are limited for this use, however, because brief flooding is common during the planting season. The potential for pasture is good. Needed management practices include controlled grazing and weed and brush control.

These soils have good potential for loblolly pine and yellow-poplar. Wetness and flooding are the main limitations to use of equipment when managing and harvesting tree crops. Problems can be avoided by using logging equipment during the drier periods. Drainage is needed in most of the lower areas to prevent high seedling mortality.

These soils have poor potential for urban and recreational uses. Wetness and flooding are the main limitations. These limitations can only be overcome by major flood control and drainage measures. Capability subclass IIIw; Riverview part in woodland suitability group 1o; Chewacla part in woodland suitability group 1w.

Ro—Roanoke silty clay loam, overwash. This deep, poorly drained, nearly level soil is on low stream terraces along larger streams of flood plains in the Piedmont Upland. It is frequently flooded for brief periods during winter and in spring. Slopes are 0 to 2 percent. Individual areas range from 15 to 50 acres.

In a typical profile the surface layer is silty clay loam about 14 inches thick. The upper part is recent overwash and is predominantly brown; the lower part is gray. The subsoil is gray clay mottled with brown. It extends to a depth of 65 inches or more.

This soil is low in both natural fertility and organic-matter content. It is strongly acid or very strongly acid throughout, except where the surface layer has been limed. Permeability is slow, and available water capacity is medium. Tilth is poor. Although the root zone is deep, a water table limits the depth of the root penetration. It is within a depth of less than 12 inches in winter and in spring.

Included with this soil in mapping are small areas of Roanoke silt loam and Roanoke fine sandy loam, a few areas of intermingled Riverview and Chewacla soils, and small areas of a poorly drained soil that has a sandy clay loam subsoil. These areas make up about 15 to 20 percent of this map unit.

This soil has poor potential for row crops and small grain. The potential for farming is limited by wetness and flooding. This soil has fair potential for hay and pasture.

This soil has fair potential for loblolly pine. Wetness and flooding are the main equipment limitations in managing and harvesting the tree crop. These limitations can be overcome by using equipment and logging during the drier seasons. Also, drainage of the soil is needed to overcome high seedling mortality.

This soil has poor potential for most urban uses. Wetness and flooding are the main limitations and are difficult to overcome. Capability subclass Vw; woodland suitability group 2w.

Rx—Rock outcrop, granite. This map unit is 90 percent or more granite bedrock that is bare and hard. It is on very gently sloping ridgetops and steep hillsides of the Piedmont Upland. The areas make up about 950 acres of the survey area, but the majority of the unit is in Heard County. Individual areas range from 5 to 100 acres.

Included in mapping are small areas of a black loamy soil that is 1 inch to 15 inches thick. These areas are 5 to 50 feet apart and make up 10 percent or less of the map unit.

This map unit has poor potential for the common uses. Because there is little or no soil material overburden, it provides an excellent source for granite.

Ud—Urban land. This map unit consists of urban land in and near the cities of La Grange and Newnan. The landscape is mainly ridgetops and hillsides near drainageways and flood plains. Commonly, the soil has been modified by cutting, filling, shaping, and smoothing. In places, the cuts are deep and expose weathered mica schist, granite, or gneiss.

Urban land makes up more than 85 percent of the mapped area. It includes business districts, shopping centers, schools, churches, parking lots, motels, industries, streets and sidewalks, housing developments, and airports. A few areas are wooded or in grass.

This map unit is essentially used for urban development, but the hazard of erosion is severe in most areas under construction. Flooding and sediment deposited by runoff from the uplands are hazards for urban areas on the flood plain.

VaB—Vance sandy loam, 2 to 6 percent slopes. This deep, well drained, very gently sloping soil is on ridgetops of divides between streams in the Piedmont Upland. Slopes are smooth and convex. Individual areas range from 15 to 50 acres.

In a typical profile the surface layer is dark grayish brown sandy loam about 8 inches thick. The subsoil is mostly firm and extends to a depth of 48 inches. It is clay in the upper part, and clay loam in the lower part. The lower part is yellowish brown and mottled with red and yellow. The underlying material, to a depth of 70 inches or more, is mottled brown, red, and yellow soft weathered gneiss saprolite.

This soil is low in both natural fertility and organic-matter content. It is strongly acid or very strongly acid throughout, except where the surface layer has been limed. Permeability is slow, and available water capacity is medium. Tilth is good. Root penetration is limited because of the firm subsoil.

Included with this soil in mapping are a few small areas of Vance gravelly sandy loam; a few knolls of Vance sandy clay loam that is eroded; and a few areas of intermingled Appling, Cecil, and Helena soils. These areas make up less than 15 percent of this map unit.

This soil has fair potential for row crops and small grain. The potential for farming is limited by the small size of some areas and by the slowly permeable subsoil, which commonly delays preparation of the soil for spring planting. The hazard of erosion is moderate if cultivated crops are grown. Conservation tillage and use of cover crops—including grasses and legumes in the cropping system—help to reduce runoff and to control erosion. This soil has good potential for hay and pasture.

This soil has fair potential for loblolly pine. It has no significant limitations for woodland use and management.

This soil has poor potential for most urban uses. The clayey subsoil has a slow percolation rate. Also, low strength is a limitation for most community development. This limitation is difficult to overcome. The hazard of erosion is severe prior to the establishment of vegetative cover. Capability subclass IIIe; woodland suitability group 3o.

VaC—Vance sandy loam, 6 to 10 percent slopes. This deep, well drained, gently sloping soil is on sides of divides between streams in the Piedmont Upland. Slopes are smooth and convex. Individual areas range from 5 to 20 acres.

In a typical profile the surface layer is brown sandy loam about 5 inches thick. The subsoil extends to a depth of 46 inches. It is clay in the upper part, and the lower part is yellowish brown clay loam mottled with red. The underlying material, to a depth of 70 inches or more, is soft weathered crystalline rock.

This soil is low in both natural fertility and organic-matter content. It is strongly acid or very strongly acid throughout, except where the surface layer has been limed. Permeability is slow, and available water capacity is medium. Tilth is good. Root penetration is limited because of the firm subsoil.

Included with this soil in mapping are a few small areas of Vance gravelly sandy loam; a few small areas of Vance sandy clay loam that is eroded; and a few areas of Appling, Cecil, and Helena soils. These areas make up less than 15 percent of this map unit.

This soil has poor potential for row crops and small grain. The potential for farming is limited by the small size of the areas and by the slowly permeable subsoil, which delays spring planting in some places. Erosion is a hazard if cultivated crops are grown. Conservation tillage and grasses and legumes in the cropping system help to reduce runoff and to control erosion. Returning crop residue to the soil helps retain good tilth. This soil has good potential for hay and pasture.

This soil has fair potential for loblolly pine. It has no significant limitations for woodland use and management.

This soil has poor potential for most urban uses. The clayey subsoil has a slow percolation rate. Also, low strength is a limitation for most community development. This limitation is difficult to overcome. Slope causes a hazard of erosion prior to the establishment of vegetative cover. Capability subclass IVe; woodland suitability group 3o.

WeC—Wedowee sandy loam, 6 to 10 percent slopes. This deep, well drained, gently sloping soil is on narrow ridgetops of the Piedmont Upland. Slopes are irregular and convex. Individual areas range from 10 to 35 acres.

In a typical profile the surface layer is brown sandy loam about 5 inches thick. The subsoil extends to a depth of about 33 inches. It is yellowish red clay in the upper part; yellowish red clay loam mottled with red and light olive brown in the middle part; and mottled yellowish red, red, and reddish yellow sandy clay loam in the lower part. Below this, to a depth of 60 inches or more, is soft weathered gneiss and granite.

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

Included with this soil in mapping are a few small areas of Wedowee gravelly sandy loam, a few areas of intermingled Appling and Pacolet soils, and a soil that has a sandy loam subsoil. These areas make up about 10 to 20 percent of this map unit.

This soil has fair potential for row crops, small grain, and hay and pasture. The potential for farming is limited by the small size of the areas and by the hazard of erosion. Good tilth is easily maintained by returning crop residue to the soil. The hazard of erosion is moderate if cultivated crops are grown. Conservation tillage and the use of cover crops—including grasses and legumes in the cropping system—help to reduce runoff and to control erosion.

This soil has fair potential for loblolly pine and yellow-poplar. It has no significant limitations for woodland use and management.

This soil has fair potential for most urban uses. A slow percolation rate and slope are limitations for septic tank absorption fields. These limitations can commonly be overcome by good design and construction. Slope is the main limitation if this soil is used for community development and recreation. Low strength, however, is also a limitation for community development. Capability subclass IIIe; woodland suitability group 3o.

WEE—Wedowee soils, 10 to 25 percent slopes. These deep, well drained, sloping and moderately steep soils are on narrow ridgetops and on hillsides of the Piedmont Upland. Wedowee soils and soils that have less clay in the subsoil than is common to the Wedowee soils are in an irregular pattern on the landscape. Individual areas of each soil are large enough to map separately, but because of present and predicted use, they were mapped as one unit. Most mapped areas contain both soils, but a few areas contain only one of the soils.

About 75 percent of the map unit is Wedowee soils. In a typical profile the surface layer is sandy loam about 7 inches thick. It is dark grayish brown in the upper part and yellowish brown in the lower part. The subsoil extends to a depth of about 34 inches. It is yellowish brown sandy clay loam in the upper few inches; yellowish red clay mottled with red and light olive brown in the middle part; and mottled yellowish red, red, and reddish yellow clay loam in the lower part. Below this, to a depth of 60 inches or more, is soft weathered gneiss and granite.

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

About 25 percent of the map unit is soils that have less clay in the subsoil than is common to the Wedowee soils. Hard bedrock is commonly at a depth of 40 inches or more, but in a few places, it is nearer the surface. In a few areas of less than one-fourth acre, stones are on the surface.

The less clayey soils are low in both natural fertility and organic-matter content. They are strongly acid or very strongly acid throughout. Permeability is moderate to rapid, and available water capacity is medium or low. Tilth is good. In most places, the root zone is deep and easily penetrated by plant roots.

This map unit has fair potential for loblolly pine and yellow-poplar. The hazard of erosion and equipment limitations are problems, but good management can help overcome these limitations.

This map unit has fair potential for hay and pasture. It has poor potential for farming and urban uses. Slope is the main limitation. Capability subclass VIe; woodland suitability group 3r.

WhB—Wickham fine sandy loam, 2 to 6 percent slopes. This deep, well drained, very gently sloping soil is on the upper part of stream terraces in the Piedmont Upland. Slopes are smooth and convex. Individual areas range from 5 to 50 acres.

In a typical profile the surface layer is predominantly dark yellowish brown fine sandy loam about 8 inches thick. The subsoil is sandy clay loam. It extends to a depth of 58 inches. It is reddish brown in the upper part, red in the middle part, and yellowish red in the lower part. Below this, to a depth of 72 inches or more, is yellowish red coarse sandy clay loam mottled with pale brown.

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

Included with this soil in mapping are a few small areas of soils that have a gravelly fine sandy loam surface layer; a few small areas of eroded soils that have a sandy clay loam surface layer; and a few areas of intermingled Cecil, Davidson, and Madison soils. These areas make up less than 10 percent of this map unit.

This soil has good potential for row crops, small grain, and hay and pasture. The potential for farming is somewhat limited, however, by the small size of most areas. Good tilth is easily maintained by returning crop residue to the soil. The hazard of erosion is moderate if cultivated crops are grown. Conservation tillage and the use of cover crops—including grasses and legumes in the cropping system—help to reduce runoff and to control erosion.

This soil has good potential for loblolly pine and yellow-poplar. It has no significant limitations for woodland use and management.

This soil has good potential for most urban uses. Seepage is a limitation for sewage lagoons and trench-type sanitary landfills. Although flooding is rare, in a few places, this soil is inundated for brief periods. These areas should be avoided for urban use because of their history

of flooding. Capability subclass IIe; woodland suitability group 2o.

WhC—Wickham fine sandy loam, 6 to 10 percent slopes. This deep, well drained, gently sloping soil is on the sides of stream terraces in the Piedmont Upland. Slopes are smooth and short. Individual areas range from 5 to 20 acres.

In a typical profile the surface layer is brown fine sandy loam about 8 inches thick. The subsoil is sandy clay loam. It extends to a depth of 58 inches. It is reddish brown in the upper part, red in the middle part, and yellowish red in the lower part. Below this, to a depth of 72 inches or more, is coarse sandy clay loam.

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

Included with this soil in mapping are a few small areas of soils that have a gravelly fine sandy loam surface layer, a few areas of eroded soils that have a sandy clay loam surface layer, and a few areas of intermingled Cecil, Davidson, and Madison soils. These areas make up less than 15 percent of this map unit.

This soil has good potential for row crops, small grain, and hay and pasture. The potential for farming is somewhat limited, however, by the small size of most areas. Good tilth is easily maintained by returning crop residue to the soil. The hazard of erosion is severe if cultivated crops are grown. Conservation tillage and the use of cover crops—including grasses and legumes in the cropping system—help to reduce runoff and to control erosion.

This soil has good potential for loblolly pine and yellow-poplar. It has no significant limitations for woodland use and management.

This soil has fair potential for most urban uses. Slope is the main limitation. In most places, this limitation can be overcome by good design and construction. Capability subclass IIIe; woodland suitability group 2o.

WvC—Wilkes gravelly sandy loam, 4 to 10 percent slopes. This shallow, well drained, very gently sloping and gently sloping soil is on narrow ridgetops of the Piedmont Upland. Slopes are smooth and convex. Individual areas range from 5 to 15 acres.

In a typical profile the surface layer is brown gravelly sandy loam about 5 inches thick. The subsoil extends to a depth of 16 inches. It is light yellowish brown sandy clay loam in the upper few inches and strong brown clay in the lower part. Below this is partially weathered granitic rock. Hard rock is at a depth of 40 inches.

This soil is low in both natural fertility and organic-matter content. It is slightly acid or medium acid throughout, except where the surface layer has been limed. Permeability is moderately slow, and available water capacity is low. Tilth is good, but tillage is hampered by gravel on the surface. Root penetration is limited because of the very firm subsoil.

Included with soil in mapping are soils that are similar to the Wilkes soil but have a thicker subsoil and a few areas of intermingled Vance and Helena soils. These soils make up about 10 to 15 percent of this map unit.

This soil has poor potential for row crops and small grain. The potential for farming is limited by the small size of the areas, by the shallow root zone, and by the gravelly surface layer. This soil has fair potential for hay and pasture. The hazard of erosion is severe if cultivated crops are grown. Conservation tillage and a cropping sequence that includes grasses and legumes help to reduce runoff and to control erosion. Good tilth can be maintained by returning crop residue to the soil.

This soil has fair potential for loblolly pine and sweetgum. It has no significant limitations for woodland use and management.

This soil has poor potential for most urban uses. Depth to rock is a limitation for most sanitary facilities and community development. This limitation is very difficult to overcome. Slope causes a severe hazard of erosion prior to the establishment of vegetative cover. Capability subclass IVs; woodland suitability group 4o.

WvF—Wilkes gravelly sandy loam, 10 to 35 percent slopes. This shallow, well drained, sloping to steep soil is on hillsides of the Piedmont Upland. Slopes are smooth and convex. Individual areas range from 10 to 50 acres.

In a typical profile the surface layer is brown gravelly sandy loam about 4 inches thick. The subsoil extends to a depth of 14 inches. It is strong brown clay in the upper few inches and is yellowish brown clay loam in the lower part. Below this is partially weathered granitic rock. Hardrock is at a depth of 40 inches.

This soil is low in both natural fertility and organic-matter content. It is slightly acid or medium acid throughout. Permeability is moderately slow, and available water capacity is medium. Tilth is good, but tillage is hampered by gravel on or near the surface. Root penetration is limited because of the very firm subsoil.

Included with soil in mapping are soils that are similar to the Wilkes soil but have a thicker subsoil; small areas of Wilkes stony sandy loam; and a few areas of intermingled Pacolet, Musella, and Vance soils. These areas make up about 20 percent of this map unit.

This soil has very low potential for growing crops and small grain because of steep slopes, gravel, and the severe hazard of erosion.

This soil has poor potential for loblolly pine and sweetgum. The hazard of erosion and equipment limitations are concerns.

This soil has poor potential for most urban uses. Slopes and depth to rock are limitations that are difficult and costly to overcome. Slope causes a severe hazard of erosion prior to the establishment of vegetative cover. Capability subclass VIIs; woodland suitability group 4r.

Use and management of the soils

The soil survey is a detailed inventory and evaluation of the most basic resource of the survey area—the soil. It is useful in adjusting land use, including urbanization, to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in uses of the land.

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

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

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

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

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

Crops and pasture

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

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

Soil erosion is the major management concern on most of the cropland and pasture in the survey area. If slope is more than 2 percent, erosion is a hazard.

Loss of the surface layer through erosion is damaging for two reasons. First, productivity is reduced as the surface layer is lost and part of the subsoil is incorporated into the plow layer. Loss of the surface layer is especially damaging on soils with a clayey subsoil, such as the Appling, Cecil, Gwinnett, and Madison soils. Second, soil erosion on farmland results in sedimentation of streams. Control of erosion minimizes the pollution of streams by sediment and improves the quality of water for municipal use, for recreation, and for fish and wildlife.

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

Management practices that help control erosion are those that provide protective surface cover, reduce runoff, and increase infiltration. A cropping system that keeps vegetative cover on the soil for extended periods can hold soil erosion losses to amounts that will not reduce the productive capacity of the soils. On livestock farms, which require pasture and hay, the legume and grass forage crops in the cropping system reduce erosion on sloping land, also provide nitrogen, and improve tilth for the following crop (fig. 7).

Slopes are so short and irregular that contour tillage or terracing is not practical in most areas of the sloping Cecil, Gwinnett, Madison, and Pacolet soils. The cropping system must provide substantial vegetative cover to control erosion unless minimum tillage is practiced. Minimizing tillage and leaving crop residue on the surface help increase infiltration and reduce the hazards of runoff and erosion. These practices can be adapted to most soils in the survey area, but they are more difficult to use sucessfully on the eroded soils. Not tilling the the soil before planting corn, an increasingly common practice, is effective in reducing erosion of sloping soils and can be adapted to most soils in the survey area. No tillage is less successful on eroded soils.

Terraces and diversions reduce the length of slope and reduce runoff and erosion. They are not practical on deep, well drained soils that have regular slopes. Appling, Cecil, Davidson, and Madison soils are suitable for terraces. The other soils are less suitable for terraces and diversions because of irregular slopes.

Contour farming is an erosion control practice used in the survey area. It is most suitable for soils that have smooth, uniform slopes, including most areas of the very gently sloping Appling, Cecil, Davidson, and Madison soils.

Information for the design of erosion control practices for each kind of soil is available from local offices of the Soil Conservation Service.

Soil drainage is the major management need on about 74,000 acres in the survey area. Another 4,400 acres of poorly drained Roanoke soils are naturally so wet that the production of crops common to the area is generally not possible.

Except in areas that are artificially drained or protected from flooding, crops grown on Chewacla and Riverview soils (about 74,000 acres) are damaged during most years. Helena and Vance soils have good natural drainage most of the year, but they tend to dry out slowly after rains.

The design of both surface and subsurface drainage systems varies with the kind of soil. A combination of surface drainage and tile drainage is needed in most areas of the poorly drained and somewhat poorly drained soils used for intensive row cropping. Drains have to be more closely spaced in soils that have slow permeability than in more permeable soils. Tile drainage is slow in Roanoke soils. Adequate outlets for tile drainage systems are hard to find in some areas, but in most places they are available. Information on drainage design for each kind of soil is available from local offices of the Soil Conservation Service.

Soil fertility is naturally low in most soils on uplands, and reaction is naturally acid. The soils on flood plains, such as the Chewacla and Riverview soils, range from very strongly acid to medium acid and are naturally higher in plant nutrients than most soils on uplands.

Most soils on uplands are naturally very strongly acid or strongly acid. If these soils have never been limed, they require applications of ground limestone to raise the pH level sufficiently for good growth of legumes and other crops that grow only on nearly neutral soils. Available phosphorus and potash levels are naturally low in most of these soils. On all soils additions of lime and fertilizer should be based on the results of soil tests, on the need of the crop, and on the expected level of yields. The Cooperative Extension Service can help in determining the kinds and amounts of fertilizer and lime to apply.

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

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

Fall plowing is generally not a good practice. Most of the cropland consists of sloping soils that are subject to damaging erosion if they are plowed in the fall.

Field crops suited to the soils and climate of the survey area include many that are not now commonly grown. Corn and, to an increasing extent, soybeans are the row crops. Grain sorghum, cotton, and potatoes are crops that can be grown if economic conditions are favorable.

Wheat and oats are the common close-growing crops. Rye, barley, and seed from lespedezas, clovers, tall fescue, and bahiagrass could be grown.

Special crops could be grown commercially in the survey area. Deep soils that have good natural drainage and that warm up early in spring are especially well suited to many vegetables and small fruits. Large areas of these soils could be adapted to special crops, such as blueberries, small fruits, grapes, many vegetables, apples, and peaches.

When adequately drained and protected from flooding, most of the soils on flood plains are suited to a wide range of vegetable crops. These soils are in the Chewacla, Riverview, and Roanoke series and make up about 74,000 acres in the survey area.

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

Latest information and suggestions for growing special crops can be obtained from local offices of the Cooperative Extension Service and the Soil Conservation Service.

Yields per acre

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

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

The yields were estimated assuming that the latest soil and crop management practices were used. Hay and pasture yields were estimated for the most productive varieties of grasses and legumes suited to the climate and the

soil. A few farmers may be obtaining average yields higher than those shown in table 5.

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

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

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

Capability classes and subclasses

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

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

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

Class I soils have few limitations that restrict their use.

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

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

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

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

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

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

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

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

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

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

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

Woodland management and productivity

W. P. Thompson, forester, Soil Conservation Service, assisted in preparing this section.

Virgin forest originally covered 97 percent of the land in Coweta, Heard, and Troup counties. Presently approximately 75 percent of the total land area is in commercial woodland.

Good stands of trees are growing in the woodlands of these counties. Trees that grow on the ridges and lower slopes of uplands are loblolly pine and shortleaf pine, along with mixed upland hardwoods. These hardwoods

that grow on bottom lands are yellow-poplar, sycamore, gum, maple, and several species of oak, including red oak and white oak.

The value of the wood products is substantial, though it is below the potential. Other valuable uses for woodland are wildlife habitat, recreation, natural beauty, and conservation of soil and water. This section explains how soils affect the growth and management of trees in the survey area.

Table 7 contains information useful to woodland owners or forest managers planning use of soils for wood crops. Map unit symbols for soils suitable for wood crops are listed, and the ordination (woodland suitability) symbol for each soil is given. All soils bearing the same ordination symbol require the same general kinds of woodland management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *x* indicates stoniness or rockiness; *w*, excessive water in or on the soil; *t*, toxic substances in the soil; *d*, restricted root depth; *c*, clay in the upper part of the soil; *s*, sandy texture; *f*, high content of coarse fragments in the soil profile; and *r*, steep slopes. The letter *o* indicates insignificant limitations or restrictions. If a soil has more than one limitation, priority in placing the soil into a limitation class is in the following order: x, w, t, d, c, s, f, and r.

In table 7 the soils are also rated for a number of factors to be considered in management. *Slight, moderate,* and *severe* are used to indicate the degree of major soil limitations.

Ratings of the *erosion hazard* indicate the risk of loss of soil in well managed woodland. The risk is *slight* if the expected soil loss is small, *moderate* if some measures are needed to control erosion during logging and road construction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive loss of soil.

Ratings of *equipment limitation* reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. A rating of *slight* indicates that use of equipment is not limited to a particular kind of equipment or time of year; *moderate* indicates a short seasonal limitation or a need for some modification in management or equipment; *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings indicate the degree that the soil affects expected mortality of planted tree seedlings. Plant competition is not considered in the ratings. Seedlings from good planting stock that are properly planted during a period of sufficient rainfall are rated. A rating of *slight* indicates that the expected mortality of the planted seedlings is less than 25 percent; *moderate*, 25 to 50 percent; and *severe*, more than 50 percent.

The *potential productivity* of merchantable or *important trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Important trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

Trees to plant are those that are suitable for commercial wood production and that are suited to the soils (fig. 8).

Engineering

David L. Payne, Jr., agricultural engineer, Soil Conservation Service, assisted in preparing this section.

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

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

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

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

These factors of soil behavior affect construction and maintenance of roads, airport runways, pipelines, foundations for small buildings, ponds and small dams, irrigation projects, drainage systems, sewage and refuse disposal systems, and other engineering works. The ranges of values can be used to (1) select potential residential, commercial, industrial, and recreational uses; (2) make preliminary estimates pertinent to construction in a partic-

ular area; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for location of sanitary landfills, onsite sewage disposal systems, and other waste disposal facilities; (5) plan detailed onsite investigations of soils and geology; (6) find sources of gravel, sand, clay, and topsoil; (7) plan farm drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; (8) relate performance of structures already built to the properties of the kinds of soil on which they are built so that performance of similar structures on the same or a similar soil in other locations can be predicted; and (9) predict the trafficability of soils for cross-country movement of vehicles and construction equipment.

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

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

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

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

Building site development

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

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

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

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

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

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

Sanitary facilities

Favorable soil properties and site features are needed for proper functioning of septic tank absorption fields, sewage lagoons, and sanitary landfills. The nature of the

soil is important in selecting sites for these facilities and in identifying limiting soil properties and site features to be considered in design and installation. Also, those soil properties that affect ease of excavation or installation of these facilities will be of interest to contractors and local officials. Table 9 shows the degree and kind of limitations of each soil for such uses and for use of the soil as daily cover for landfills. It is important to observe local ordinances and regulations.

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

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

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

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

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

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

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

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

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

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

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

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

Construction materials

The suitability of each soil as a source of roadfill, sand, gravel, and topsoil is indicated in table 10 by ratings of good, fair, or poor. The texture, thickness, and organic-

matter content of each soil horizon are important factors in rating soils for use as construction materials. Each soil is evaluated to the depth observed, generally about 6 feet.

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

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

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

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

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

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

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

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

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

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

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

Water management

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

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

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

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

Drainage of soil is affected by such soil properties as permeability; texture; depth to bedrock, hardpan, or other

layers that affect the rate of water movement; depth to the water table; slope; stability of ditchbanks; susceptibility to flooding; salinity and alkalinity; and availability of outlets for drainage.

Irrigation is affected by such features as slope, susceptibility to flooding, hazards of water erosion and soil blowing, texture, presence of salts and alkali, depth of root zone, rate of water intake at the surface, permeability of the soil below the surface layer, available water capacity, need for drainage, and depth to the water table (fig. 9).

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

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

Recreation

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

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

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

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

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

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

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

Wildlife habitat

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

The survey area provides habitat for a variety of wildlife species. Deer, raccoon, squirrel, many songbirds, and nongame animals are common to woodlands. Quail, rabbit, and dove are abundant on croplands. The Chattahoochee River and West Point Reservoir provide habitat for migrant waterfowl. Additional waterfowl habitat, especially attractive to wood ducks, is provided by 600 acres of beaver ponds.

The 27,000 acres of lake of the West Point Reservoir; the 1,400 farm ponds; and 25 miles of the Chattahoochee River also provide habitat for fish.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Soil properties

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

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

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

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

Engineering properties

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

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

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

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

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

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

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

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

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

and on observations of the many soil borings made during the survey.

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

Physical and chemical properties

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

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

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

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

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

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

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

Soil and water features

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

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

The four hydrologic soil groups are:

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

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

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

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clay soils that have a high shrink-swell potential,

soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

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

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

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

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

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

Engineering test data

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

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

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

The methods and codes are AASHTO classification (M-145); Unified classification (D-2487); mechanical analysis (T88); liquid limit (T89); plasticity index (T90); moisture-density, method A (T99); volume change (GHD-6).

Classification of the soils

The system of soil classification currently used was adopted by the National Cooperative Soil Survey in 1965. Readers interested in further details about the system should refer to "Soil taxonomy" (*7*).

The system of classification has six categories. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. In this system the classification is based on the different soil properties that can be observed in the field or those that can be inferred either from other properties that are observable in the field or from the combined data of soil science and other disciplines. The properties selected for the higher categories are the result of soil genesis or of factors that affect soil genesis. In table 18, the soils of the survey area are classified according to the system. Categories of the system are discussed in the following paragraphs.

ORDER. Ten soil orders are recognized as classes in the system. The properties used to differentiate among orders are those that reflect the kind and degree of dominant soil-forming processes that have taken place. Each order is identified by a word ending in *sol*. An example is Entisol.

SUBORDER. Each order is divided into suborders based primarily on properties that influence soil genesis and are important to plant growth or that are selected to reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order.

An example is Aquent (*Aqu*, meaning water, plus *ent*, from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of expression of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and a prefix that suggests something about the properties of the soil. An example is Haplaquents (*Hapl*, meaning simple horizons, plus *aquent*, the suborder of Entisols that have an aquic moisture regime).

SUBGROUP. Each great group may be divided into three subgroups: the central (typic) concept of the great groups, which is not necessarily the most extensive subgroup; the intergrades, or transitional forms to other orders, suborders, or great groups; and the extragrades, which have some properties that are representative of the great groups but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that is thought to typify the great group. An example is Typic Haplaquents.

FAMILY. Families are established within a subgroup on the basis of similar physical and chemical properties that affect management. Among the properties considered in horizons of major biological activity below plow depth are particle-size distribution, mineral content, temperature regime, thickness of the soil penetrable by roots, consistence, moisture equivalent, soil slope, and permanent cracks. A family name consists of the name of a subgroup and a series of adjectives. The adjectives are the class names for the soil properties used as family differentiae. An example is fine-loamy, mixed, nonacid, mesic, Typic Haplaquents.

SERIES. The series consists of soils that formed in a particular kind of material and have horizons that, except for texture of the surface soil or of the underlying substratum, are similar in differentiating characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineral and chemical composition.

Soil series and morphology

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

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

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

Altavista series

The Altavista series consists of deep, moderately well drained, moderately permeable soils formed in loamy sediment on stream terraces of the Piedmont Upland. Depth to the seasonal high water table is 18 to 30 inches late in winter and early in spring. Slope ranges from 2 to 6 percent.

Altavista soils are in the same landscape as Roanoke and Wickham soils. Roanoke soils are on lower stream terraces, have a clayey control section, and are poorly drained. Wickham soils are commonly on higher stream terraces and are well drained.

Typical pedon of Altavista fine sandy loam, 2 to 6 percent slopes, in a wooded area of Coweta County; 10.0 miles west of Newnan, 1.5 miles southeast of the intersection of State Highway 34 and J. D. Walton Road, 75 feet north of J. D. Walton Road, and 750 feet west of Long Branch:

Ap—0 to 5 inches; brown (10YR 4/3) fine sandy loam; weak medium granular structure; very friable; many fine and medium roots; medium acid; clear smooth boundary.

B1—5 to 9 inches; yellowish brown (10YR 5/4) sandy clay loam; weak medium subangular blocky structure; friable; few medium roots; medium acid; clear smooth boundary.

B21t—9 to 20 inches; yellowish brown (10YR 5/6) sandy clay loam; moderate medium subangular blocky structure; friable; few medium roots; patchy clay films on faces of peds; few water-rounded pebbles; strongly acid; clear smooth boundary.

B22t—20 to 40 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium distinct gray (10YR 6/1) mottles; moderate medium subangular blocky structure; friable; patchy clay films on faces of peds; few water-rounded pebbles; strongly acid; gradual smooth boundary.

B3—40 to 46 inches; mottled yellowish brown (10YR 5/6), pale brown (10YR 6/3), and light gray (10YR 7/1) sandy clay loam; weak medium subangular blocky structure; friable; few water-rounded pebbles; few fine flakes of mica; strongly acid; abrupt wavy boundary.

IICr&B—46 to 62 inches; mottled yellowish brown (10YR 5/6), pale brown (10YR 6/3), and light gray (10YR 7/1) clay and tongues and pockets of sandy clay loam; massive; firm; few fine flakes of fine mica; strongly acid.

The solum ranges from 42 to 60 inches in thickness. It is medium acid or strongly acid throughout, except where the surface layer has been limed. The A horizon is 5 to 8

inches thick. Hue is 10YR or 7.5YR, value is 4 or 5, and chroma is 2 or 3. The Bt horizon is 30 to 40 inches thick. Hue is 10YR or 7.5YR, value is 5 or 6, and chroma is 4 or 6. Few or common, fine or medium gray mottles are within a depth of the upper 24 inches. The C horizon is massive clay, coarse sandy loam, or loamy sand and different amounts of water-rounded pebbles.

Appling series

The Appling series consists of deep, well drained, moderately permeable soils that formed in material derived mainly from schist, gneiss, and granite. These soils are on broad divides between streams in the Piedmont Upland. Slopes are 2 to 15 percent.

Appling soils are in the same landscape as Cecil and Helena soils. Cecil soils commonly are on the higher part of uplands and have a redder subsoil. Helena soils are moderately well drained and have a firm, plastic, slowly permeable subsoil.

Typical pedon of Appling sandy loam, 2 to 6 percent slopes, in a cultivated field of Coweta County; 600 feet east of Clearwater Road, near private drive, 1.0 mile north of Clearwater Lake, and 1.5 miles southwest of Sharpsburg:

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) sandy loam; weak medium granular structure; very friable; common fine and very fine roots; 6 percent medium quartz pebbles; strongly acid; clear smooth boundary.

B1—5 to 10 inches; yellowish brown (10YR 5/4) sandy clay loam; weak medium subangular blocky structure; friable; common fine and very fine roots; few medium quartz pebbles; strongly acid; gradual smooth boundary.

B21t—10 to 21 inches; yellowish brown (10YR 5/6) sandy clay; moderate medium subangular blocky structure; firm; few fine and very fine roots; thin patchy clay films on faces of peds; strongly acid; gradual smooth boundary.

B22t—21 to 34 inches; yellowish brown (10YR 5/6) clay; common medium distinct yellowish red (5YR 5/6) and strong brown (7.5YR 5/6) mottles; moderate medium subangular and angular blocky structure; firm; few fine and very fine roots; thick continuous clay films on faces of peds; strongly acid; gradual smooth boundary.

B3—34 to 52 inches; mottled yellowish brown (10YR 5/6), yellowish red (5YR 5/6), and very pale brown (10YR 7/3) sandy clay loam; weak medium subangular blocky structure; friable; few thin patchy clay films on faces of peds; few fine flakes of mica; strongly acid; gradual smooth boundary.

C—52 to 62 inches; mottled yellowish brown (10YR 5/6), yellowish red (5YR 5/8), and very pale brown (10YR 7/3) saprolite that crushes to loam; friable; common fine flakes of mica; strongly acid.

The solum ranges from 40 to 60 inches in thickness. It is strongly acid or very strongly acid throughout, except where the surface layer has been limed. The A horizon is 3 to 10 inches thick. Hue is 10YR or 2.5Y, value is 4 to 6, and chroma is 2 to 4. This horizon is sandy loam or sandy clay loam. The Bt horizon is 20 to 36 inches thick. Hue is 10YR to 5YR, value is 4 to 6, and chroma is 6 to 8. This horizon is sandy clay or clay. It has red and brown mottles that range from none to common in the upper part and that are common or many in the lower part. The B3 horizon is 10 to 20 inches thick. Hue is 10YR to 5YR, value is 4 to 6, and chroma is 6 to 8. This horizon is sandy clay loam or clay loam.

Cecil series

The Cecil series consists of deep, well drained, moderately permeable soils that formed in material derived mainly from granite, gneiss, and mica schist. These soils are on ridgetops and hillsides of the Piedmont Upland. Slopes are 2 to 25 percent.

Cecil soils are in the same landscape as Appling and Pacolet soils. Appling soils commonly are in lower areas of the upland and are yellower throughout than Cecil soils. Pacolet soils are mainly on hillsides and have a thinner solum.

Typical pedon of Cecil sandy loam, 2 to 6 percent slopes, in a roadcut of Troup County; 80 miles south of La Grange on Floyd Road, 300 feet east from junction with Salem Road:

Ap—0 to 5 inches; reddish brown (5YR 4/4) sandy loam; weak medium granular structure; very friable; many fine roots; few quartz pebbles; strongly acid; abrupt smooth boundary.

B21t—5 to 26 inches; red (2.5YR 4/8) clay; moderate medium subangular blocky and angular blocky structure; firm; common fine roots; thick continuous clay films on faces of peds; strongly acid; gradual smooth boundary.

B22t—26 to 43 inches; red (2.5YR 4/8) clay; moderate medium subangular blocky structure; firm; few fine roots; thin patchy clay films on faces of peds; few fine flakes of mica; strongly acid; gradual wavy boundary.

B3—43 to 53 inches; red (2.5YR 4/8) clay loam; weak medium subangular blocky structure; friable; few thin patchy clay films on vertical faces of peds; few fine flakes of mica; strongly acid; gradual wavy boundary.

C—53 to 72 inches; mottled red (2.5YR 4/8) and reddish brown (2.5YR 4/4) weathered gneiss that has pockets of sandy clay loam; massive; friable; common fine flakes of mica; strongly acid.

The solum ranges from 40 to 60 inches or more in thickness. It is strongly acid or very strongly acid throughout, except where the surface layer has been limed. The A horizon is 4 to 7 inches thick. Hue is 10YR to 2.5YR; value is 3 to 5; and chroma is 3, 4, 6, or 8. This horizon is

sandy loam or sandy clay loam. The Bt horizon is 23 to 44 inches thick. Hue is 2.5YR, value is 4 or 5, and chroma is 6 or 8. This horizon is clay or clay loam.

Chewacla series

The Chewacla series consists of deep, somewhat poorly drained, moderately permeable soils that formed in loamy alluvium on flood plains. These soils are along the larger streams and tributaries of the Piedmont Upland. Depth to the water table is commonly 6 to 18 inches during winter and early spring. Probability of brief flooding during this period is high. Slopes are less than 2 percent.

Chewacla soils are in the same landscape as Riverview and Roanoke soils. Riverview soils are well drained and commonly are on high flood plains adjacent to stream channels. Roanoke soils are on low stream terraces adjacent to the uplands, are poorly drained, and have a clayey control section.

Typical pedon of Chewacla loam in an area of Riverview-Chewacla association, in a wooded area of Troup County; 4.0 miles south of Hogansville, 900 feet east of U.S. Highway 29, and 400 feet south of Beech Creek:

A1—0 to 8 inches; dark brown (7.5YR 4/4) loam; moderate fine granular structure; friable; many fine and very fine roots; few fine flakes of mica; medium acid; gradual smooth boundary.

B21—8 to 18 inches; brown (7.5YR 5/4) loam; weak medium subangular blocky structure; friable; common fine and very fine roots; few fine flakes of mica; medium acid; gradual smooth boundary.

B22—18 to 34 inches; brown (7.5YR 5/4) loam; few fine faint grayish brown mottles; weak medium subangular blocky structure; friable; slightly sticky; few fine and medium roots; few fine flakes of mica; medium acid; gradual smooth boundary.

B23g—34 to 65 inches; gray (10YR 5/1) silty clay loam; common medium distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; few small black concretions and bits of organic matter; medium acid.

The solum ranges from 38 to 70 inches in thickness. It is medium acid or strongly acid throughout, except where the surface layer has been limed. The A horizon is commonly less than 10 inches thick. Hue is 10YR, value is 3 to 5, and chroma is 2 to 4; or hue is 7.5YR, value is 3 to 5, and chroma is 2 or 3. The B horizon is 40 to 60 inches thick. In the upper part hue is 10YR, value is 4 to 5, and chroma is 3 or 4; or hue is 7.5YR, value is 4 or 5, and chroma is 2 or 4. In the lower part hue is 10YR or 2.5Y, value is 5 or 6, and chroma is 1 or 2. Few to common, fine or medium brown mottles are in most pedons. This horizon is silty clay loam, sandy clay loam, silt loam, or clay loam.

Davidson series

The Davidson series consists of deep, well drained, moderately permeable soils that formed in material derived from diorite, gneiss, and hornblende gneiss. These soils are on ridgetops of the Piedmont Upland. Slopes range from 2 to 6 percent.

Davidson soils are in the same landscape as Cecil, Gwinnett, and Musella soils. These associated soils have a thinner solum. Also, Cecil soils are less red throughout than the Davidson soils, and Musella soils have a loamy control section.

Typical pedon of Davidson loam, 2 to 6 percent slopes, in a roadcut of Troup County; 1.5 miles north of Mountville on Alvason Road:

Ap—0 to 7 inches; dark reddish brown (5YR 3/4) loam; weak medium granular and subangular blocky structure; friable; many fine roots; few quartz pebbles and concretions of ironstone; medium acid; clear smooth boundary.

B21t—7 to 56 inches; dark red (2.5YR 3/6) clay; moderate medium subangular blocky structure; firm; common fine roots in upper part; thick continuous clay films on faces of peds; few quartz pebbles; medium acid; gradual wavy boundary.

B22t—56 to 65 inches; dark red (2.5YR 3/6) clay; few fine distinct yellowish red mottles; moderate medium subangular blocky structure; firm; thin discontinuous clay films on faces of peds; medium acid.

The solum ranges from 60 to 100 inches in thickness. It ranges from medium acid to strongly acid throughout, except where the surface layer has been limed. The A horizon is 5 to 7 inches thick. Hue is 5YR to 10R, value is 3, and chroma is 3 or 4. The Bt horizon is 50 to 80 inches thick. In the B21t horizon hue is 10R or 2.5YR, value is 3, and chroma is 6. In the B22t horizon hue is 10R or 2.5YR, value is 3 or 4, and chroma is 6. This horizon contains few, fine, medium brown and red mottles. The B22t horizon is clay or clay loam.

Gwinnett series

The Gwinnett series consists of deep, well drained, moderately permeable soils that formed in material derived from gneiss and schist. These soils are on ridgetops and hillsides of the Piedmont Upland. Slopes range 6 to 15 percent.

Gwinnett soils are in the same landscape as Davidson and Musella soils. Davidson soils commonly are on broader and smoother ridgetops; also, they have a thicker solum than Gwinnett soils. Musella soils commonly are steeper and have a thinner solum than the Gwinnett soils. They have a loamy control section.

Typical pedon of Gwinnett sandy clay loam, 10 to 15 percent slopes, eroded, in a wooded area of Troup

County; 2.0 miles southwest of Ware's Crossroads on Cameron Mill Road:

Ap—0 to 4 inches; dark reddish brown (5YR 3/4) sandy clay loam; weak medium subangular blocky structure; friable; many fine roots; 8 percent medium quartz pebbles and 2 percent black concretions; few cobbles; medium acid; clear smooth boundary.

B21t—4 to 19 inches; dark red (2.5YR 3/6) clay; moderate medium subangular blocky structure; friable; few fine and medium roots; patchy clay films on faces of peds; few fine pebbles; medium acid; gradual wavy boundary.

B22t—19 to 29 inches; dark red (2.5YR 3/6) clay; moderate medium subangular blocky structure; friable; patchy clay films on faces of peds; few fine pebbles and about 10 percent brown gneiss fragments and black concretions; medium acid; abrupt irregular boundary.

Cr—29 to 45 inches; weathered dark colored fractured rock; dark red clay in cracks and seams between rock fragments and on faces of rock.

The solum ranges from 22 to 40 inches in thickness. It is medium acid or strongly acid throughout, except where the surface layer has been limed. The A horizon is 4 to 6 inches thick. Hue is 5YR, value is 3, and chroma is 3 or 4; or hue is 2.5YR, value is 2 or 3, and chroma is 4. Content of pebbles ranges from 0 to 10 percent. The Bt horizon is 16 to 36 inches thick. Hue is 2.5YR, value is 3, and chroma is 4 or 6. The horizon contains few and common flakes of mica.

Helena series

The Helena series consists of moderately well drained, slowly permeable soils that formed in material derived mainly from granite and gneiss. These soils are on divides between streams and are on lower slopes of the Piedmont Upland. Slopes range from 2 to 10 percent.

Helena soils are in the same landscape as Appling, Vance, and Wilkes soils. Appling soils are better drained and have a subsoil that is less firm and sticky than the Helena soils. Vance and Wilkes soils are better drained. Wilkes soils have a thinner solum and a higher base saturation.

Typical pedon of Helena sandy loam, 2 to 6 percent slopes, in a wooded area of Coweta County; 1.5 miles southwest of Sharpsburg along Neely Road:

Ap—0 to 6 inches; yellowish brown (10YR 5/4) sandy loam; weak medium granular structure; very friable; common fine and medium roots; few fine pores; common fine pebbles; very strongly acid; clear smooth boundary.

B1—6 to 8 inches; yellowish brown (10YR 5/4) sandy clay loam; weak medium subangular blocky structure; friable; common fine roots; few fine pores; few small pebbles; strongly acid; abrupt smooth boundary.

B21t—8 to 16 inches; yellowish brown (10YR 5/6) sandy clay; moderate coarse prismatic and blocky structure; firm; common fine roots along faces of prisms; thick continuous clay films on vertical and horizontal faces of prisms; strongly acid; gradual wavy boundary.

B22t—16 to 24 inches; yellowish brown (10YR 5/8) sandy clay; common medium distinct light brownish gray (2.5Y 6/2) and strong brown (7.5YR 5/8) mottles; moderate coarse prismatic and subangular blocky structure; firm, plastic; few medium roots; patchy clay films on faces of peds; few coarse quartz pebbles; strongly acid; gradual wavy boundary.

Cr&B—24 to 34 inches; light olive gray (5Y 6/2) soft weathered granite and gneiss; common medium distinct stong brown (7.5YR 5/8) mottles; moderate coarse prismatic structure in B part and massive in Cr part; firm; light yellowish brown (10YR 6/4) clay in tongues between fractured rock and clay films on faces of prisms; common coarse pebbles; many flakes of mica; very strongly acid; gradual wavy boundary.

Cr—34 to 62 inches; light olive gray (5Y 6/2) weathered granite and gneiss; crushes to sandy clay loam; massive; very firm; very strongly acid.

The solum ranges from 24 to 40 inches in thickness. It is strongly acid or very strongly acid throughout, except where the surface layer has been limed. The A horizon is 6 to 11 inches thick. Hue is 10YR or 2.5Y, value is 4 to 6, and chroma is 2 to 4. This horizon contains few or common pebbles. The Bt horizon is 16 to 24 inches thick. Hue is 10YR or 2.5Y, value is 5 or 6, and chroma is 4 to 8. Faint to distinct mottles of 2 chroma or less are in the upper 24 inches of the Bt horizon. This horizon is sandy clay or clay.

Louisa series

The Louisa series consists of shallow, somewhat excessively drained, moderately rapidly permeable soils that formed in material derived from mica schist or mica gneiss. These soils are on ridgetops and hillsides of the Piedmont Upland. Slopes are 6 to 40 percent.

Louisa soils are in the same landscape as Madison soils. Madison soils commonly are on broader and smoother ridgetops and less sloping hillsides than the Louisa soils. Also, Madison soils have a thicker solum and a continuous argillic horizon.

Typical pedon of Louisa gravelly fine sandy loam, 15 to 40 percent slopes, in a roadcut of Heard County; 900 feet south of bridge over Town Creek, and 2.0 miles southwest of Ridgeway Baptist Church:

A11—0 to 1 inch; dark brown (10YR 3/3) gravelly fine sandy loam; weak medium granular structure; very friable; many fine roots; about 20 percent fragments

of schist; many fine and medium flakes of mica; medium acid; clear smooth boundary.

A12—1 inch to 5 inches; dark yellowish brown (10YR 4/4) gravelly fine sandy loam; weak medium granular structure; very friable; many fine and medium roots; about 20 percent fragments of schist; many fine and medium flakes of mica; medium acid; clear smooth boundary.

B2—5 to 16 inches; brown (7.5YR 4/4) gravelly loam; weak medium subangular blocky structure; friable; common fine and medium roots; about 20 percent fragments of schist; many fine and medium flakes of mica; medium acid; clear wavy boundary.

Cr—16 to 84 inches; tilted layers of weathered gray mica schist that have different degrees of hardness.

The solum ranges from 10 to 20 inches in thickness. It is medium acid or strongly acid throughout, except where the surface layer has been limed. The A horizon is 2 to 5 inches thick. Hue is 10YR or 7.5YR, value is 3 or 4, and chroma is 2 to 4. The B horizon is 8 to 15 inches thick. In the cambic part of this horizon hue is 7.5YR or 10YR, value is 4 to 5, and chroma is 4 to 8. This part is loam, sandy loam, gravelly loam, or gravelly sandy loam. The argillic part of this horizon makes up about 40 percent of each pedon. In this part hue is 2.5YR to 7.5YR, value is 4 or 5, and chroma is 6 or 8. It is clay loam, sandy clay loam, gravelly clay loam, or gravelly sandy clay loam.

Madison series

The Madison series consists of deep, well drained, moderately permeable soils that formed in material derived from mica schist. These soils are on ridgetops and hillsides of the Piedmont Upland. Slopes range from 2 to 25 percent.

Madison soils are in the same landscape as Cecil and Louisa soils. Cecil soils contain less mica throughout. Louisa soils commonly are on more narrow ridgetops and more sloping hillsides. They have a cambic horizon interrupted in short horizontal distances by an argillic horizon.

Typical pedon of Madison gravelly sandy clay loam, 10 to 15 percent slopes, eroded, in a grassland area of Heard County; 0.75 mile northwest of Ephesus Baptist Church and 600 feet north of dirt road:

Ap1—0 to 3 inches; reddish brown (5YR 4/4) gravelly sandy clay loam; moderate medium granular structure; friable; many fine roots; about 20 percent pebbles; common fine flakes of mica; medium acid; abrupt smooth boundary.

Ap2—3 to 5 inches; red (2.5YR 4/6) sandy clay loam; common medium faint reddish brown (5YR 4/4) mottles; weak fine subangular blocky structure; friable; many fine roots; about 4 percent pebbles; common fine flakes of mica; medium acid; clear smooth boundary.

B2t—5 to 24 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky and angular blocky structure; firm; common fine roots; thick continuous clay films on faces of peds and a small amount of A horizon material between peds in upper part; 5 to 10 percent pebbles; many fine flakes of mica; strongly acid; clear wavy boundary.

B3—24 to 36 inches; red (2.5YR 4/8) clay loam; weak medium subangular blocky structure; friable; few thin clay films on faces of peds; many fine flakes of mica; strongly acid; abrupt wavy boundary.

C—36 to 52 inches; yellowish red (5YR 5/6) sandy loam; massive; friable; common soft fragments of schist; many fine flakes of mica; strongly acid.

The solum ranges from 21 to 40 inches in thickness. It is strongly acid or very strongly acid throughout, except where the surface layer has been limed. The A horizon is 3 to 6 inches thick. Hue is 7.5YR or 10YR, value is 4 or 5, and chroma is 2 to 4; or hue is 5YR, value is 4 or 5, and chroma is 3 or 4. This horizon is gravelly sandy clay loam or gravelly sandy loam. The Bt horizon is 12 to 23 inches thick. Hue is 2.5YR, value is 4 or 5, and chroma is 6 to 8. This horizon is clay or clay loam.

Musella series

The Musella series consists of shallow, well drained, moderately permeable soils that formed in material derived from acidic and basic rock. These soils are on ridgetops and hillsides of the Piedmont Upland. Slopes range from 6 to 25 percent.

Musella soils are in the same landscape as Davidson and Gwinnett soils. Davidson soils are on broader, smoother, and less sloping ridgetops than the Musella soils. They have a thick clayey subsoil. Gwinnett soils commonly are less sloping and have a moderately thick clayey subsoil.

Typical pedon of Musella stony clay loam, 10 to 25 percent slopes, in a wooded area of Heard County; 3.5 miles west of Franklin, 450 feet north of Red Land Road, and 75 feet east of Hillabahatchee Creek:

A11—0 to 2 inches; dark reddish brown (5YR 3/3) stony clay loam; weak fine granular structure; very friable; many fine roots; about 3 percent of surface covered with stones; 15 to 20 percent fine pebbles; slightly acid; abrupt smooth boundary.

A12—2 to 5 inches; dark reddish brown (5YR 3/4) gravelly clay loam; moderate fine and medium subangular blocky structure; friable; many fine roots; 15 to 20 percent fine pebbles; slightly acid; clear smooth boundary.

B2t—5 to 18 inches; dark red (2.5YR 3/6) gravelly clay loam; moderate medium subangular blocky structure; friable; common fine roots; thin patchy clay films on faces of peds; about 4 percent cobbles and stones

and 20 percent pebbles; medium acid; abrupt irregular boundary.

Cr—18 to 23 inches; weathered dark grayish brown (10YR 3/2) rock that has different degrees of hardness; few narrow tongues or pockets of dark red clay; few fine roots along fracture lines; medium acid; abrupt irregular boundary.

R—23 to 60 inches; very dark grayish brown (10YR 3/2) and yellow (10YR 7/6) fractured bedrock.

The solum ranges from 14 to 20 inches in thickness. It is slightly acid to strongly acid throughout. The A horizon is 3 to 5 inches thick. Hue is 5YR to 10R, value is 3, and chroma is 3 or 4. This horizon is clay loam or stony clay loam. The B horizon is 12 to 15 inches thick. Hue is 2.5YR or 10R, value is 3, and chroma is 4 or 6.

Pacolet series

The Pacolet series consists of deep, well drained, moderately permeable soils that formed in material derived mainly from granite, gneiss, and mica schist. These soils are on ridgetops and hillsides of the Piedmont Upland. Slopes range from 6 to 40 percent.

Pacolet soils are in the same landscape as Cecil and Wedowee soils. Cecil soils commonly are on broader and smoother ridgetops and less sloping hillsides than the Pacolet soils. They have a thicker solum. Wedowee soils have a more yellowish subsoil.

Typical pedon of Pacolet sandy clay loam, 15 to 25 percent slopes, eroded, in a wooded area of Heard County; 3.0 miles southeast of Franklin, and 300 feet south of U.S. Highway 27:

A1—0 to 2 inches; brown (10YR 5/3) sandy clay loam; weak medium granular structure; very friable; many fine roots; few fine pores; few fine pebbles; few fine flakes of mica; strongly acid; clear smooth boundary.

B1—2 to 5 inches; yellowish red (5YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable; about 20 percent brown (7.5YR 4/4) sandy loam pockets; many fine roots; few fine pebbles; few fine flakes of mica; strongly acid; clear smooth boundary.

B2t—5 to 19 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; firm; common fine roots; patchy clay films on faces of peds; common fine flakes of mica; strongly acid; gradual smooth boundary.

B3—19 to 28 inches; yellowish red (5YR 5/8) clay loam; weak medium subangular blocky structure; friable; few fine and medium roots; common fine flakes of mica; strongly acid; abrupt wavy boundary.

Cr—28 to 60 inches; yellowish red (5YR 5/8) saprolite that crushes to sandy loam; rock controlled structure; friable; few fine pebbles; many fine and medium flakes of mica; strongly acid.

The solum ranges from 22 to 40 inches in thickness. It is medium acid to very strongly acid throughout, except where the surface layer has been limed. The A horizon is 2 to 6 inches thick. Hue is 10YR to 5YR, value is 4 or 5, and chroma is 2 to 4. This horizon is sandy clay loam or sandy loam. The Bt horizon is 11 to 16 inches thick. Hue is 2.5YR, value is 4 or 5, and chroma is 6 or 8. This horizon is clay, clay loam, or sandy clay.

Riverview series

The Riverview series consists of deep, well drained, moderately permeable soils that formed in loamy sediment on flood plains. These soils are near creeks and rivers that drain from the Piedmont Upland. In places they are in depressions on uplands. Depth to the water table is commonly 36 to 60 inches during winter and early in spring. Probability of brief flooding during this period is high. Slopes are less than 2 percent.

Riverview soils are in the same landscape as Chewacla and Roanoke soils. Chewacla soils are somewhat poorly drained and commonly are on lower flood plains away from the stream channel. Roanoke soils are on low stream terraces, are poorly drained, and have a clayey control section.

Typical pedon of Riverview loam in a wooded area of Coweta County; 4.0 miles southwest of Newnan, 300 feet east of Holbrook Road, and 40 feet north of Sandy Creek:

A1—0 to 5 inches; dark brown (10YR 4/3) loam; few thin dark brown (7.5YR 4/4) loamy sand strata; weak medium granular structure; very friable; many fine and very fine roots; common fine flakes of mica; strongly acid; clear smooth boundary.

B21—5 to 14 inches; brown (7.5YR 5/4) silty clay loam; common medium faint yellowish red (5YR 4/6) mottles; moderate medium subangular blocky structure; friable; common fine and medium roots; common fine flakes of mica; strongly acid; gradual smooth boundary.

B22—14 to 25 inches; dark yellowish brown (10YR 4/4) silty clay loam; few medium distinct yellowish red (5YR 4/6) mottles; moderate medium subangular blocky structure; friable; common fine and medium roots; common fine flakes of mica; strongly acid; clear smooth boundary.

B3—25 to 34 inches; dark yellowish brown (10YR 4/4) loam; few fine distinct yellowish red mottles; weak medium subangular blocky structure; very friable; few fine roots; common fine flakes of mica; strongly acid; clear wavy boundary.

C—34 to 65 inches; dark brown (7.5YR 4/4) loamy sand; thin dark yellowish brown (10YR 4/6) loam strata; single grained; loose; many fine flakes of mica; strongly acid.

The solum ranges from 26 to 40 inches in thickness. It is strongly acid or very strongly acid throughout, except

where the surface layer has been limed. The A horizon is 4 to 7 inches thick. Hue is 10YR or 7.5YR, value is 3 to 5, and chroma is 2 or 4. The B horizon is 20 to 36 inches thick. Hue is 10YR or 7.5YR, value is 4 or 5, and chroma is 4 or 6. This horizon is silty clay loam, silt loam, or loam. The C horizon is loamy sand, or it is sandy loam and thin strata of silt loam, loam, or silty clay loam.

Roanoke series

The Roanoke series consists of deep, poorly drained, slowly permeable soils that formed in loamy and clayey sediment on low stream terraces within the Piedmont Upland. The soils are frequently flooded for brief periods during winter and spring. Depth to the water table is less than 12 inches for about 6 months each year. Slopes are less than 2 percent.

Roanoke soils are in the same landscape as Altavista, Chewacla, and Riverview soils. Altavista soils are on higher stream terraces and are moderately well drained. Chewacla and Riverview soils are on adjacent flood plains and have a loamy control section. Chewacla soils are somewhat poorly drained, while Riverview soils are well drained.

Typical pedon of Roanoke silty clay loam, overwash, in a wooded area of Coweta County; 2.0 miles east of Senoia, near the end of an abandoned dirt road, and 600 feet west of Line Creek:

A11—0 to 2 inches; very dark grayish brown (10YR 3/2) silty clay loam; moderate fine granular structure; friable, slightly sticky; many fine and medium roots; strongly acid; clear smooth boundary.

A12—2 to 8 inches; brown (7.5YR 5/4) silty clay loam; moderate medium granular structure; friable, slightly sticky; many fine and medium roots; strongly acid; clear smooth boundary.

A13b—8 to 14 inches; gray (10YR 5/1) silty clay loam; moderate fine granular structure; friable, slightly sticky; common fine and medium roots; strongly acid; clear smooth boundary.

B21tgb—14 to 30 inches; gray (10YR 6/1) clay; common fine distinct brown (7.5YR 4/4) mottles; moderate medium angular blocky structure; firm, sticky; few fine and medium roots; thin patchy clay films on faces of peds; few fine flakes of mica; strongly acid; gradual smooth boundary.

B22tgb—30 to 52 inches; gray (10YR 6/1) clay; common medium distinct strong brown (7.5YR 5/8) mottles; moderate medium angular blocky structure; firm, sticky; few fine and medium roots; thin patchy clay films on faces of peds; few fine flakes of mica; strongly acid; gradual smooth boundary.

B3gb—52 to 65 inches; gray (N 6/0) clay; common coarse prominent strong brown (7.5YR 5/8) mottles; massive; firm, sticky; few fine flakes of mica; strongly acid.

The solum ranges from 40 to 60 inches in thickness. It is strongly acid or very strongly acid throughout, except where the surface layer has been limed. The A horizon formed in loamy sediment. The upper part is recent overwash material 6 to 18 inches thick. In individual strata hue is 10YR or 7.5YR, value is 3 to 6, and chroma is 2 or 3. The buried part of the A horizon is 5 to 9 inches thick. Hue is 10YR, value is 4 to 6, and chroma is 1 or 2. The Bt horizon is 38 to 60 inches or more thick. Colors are neutral, or hue is 10YR, value is 5 or 6, and chroma is 1.

Soils that have slightly less silt than that defined for the Roanoke series were considered as Roanoke in naming map units. Their behavior is essentially like that of Roanoke soils.

Vance series

The Vance series consists of deep, well drained, slowly permeable soils that formed in material derived from crystalline rock. These soils are on ridgetops and hillsides of broad divides between streams in the Piedmont Upland. Slopes range from 2 to 10 percent.

Vance soils are in the same landscape as Cecil, Helena, and Wilkes soils. Cecil soils commonly are on higher convex ridgetops and have a subsoil that is redder and less plastic than Vance soils. Helena soils are in the lower areas near streams and drainageways and are less well drained. Wilkes soils are on more narrow ridgetops and steeper hillsides; also, they have a thinner solum.

Typical pedon of Vance sandy loam, 2 to 6 percent slopes, in a pasture of Troup County; 3.5 miles southeast of La Grange along Hood Road, 0.5 mile southwest of the intersection of Hood and John Lovelace Roads, and 100 feet south of road:

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) sandy loam; weak fine granular structure; very friable; many fine and medium roots; 10 percent, by volume, quartz pebbles; very strongly acid; abrupt smooth boundary.

B21t—8 to 13 inches; yellowish brown (10YR 5/6) clay; moderate medium subangular blocky structure; firm; few fine and medium roots; common fine pores; thick continuous clay films on faces of peds; very strongly acid; gradual smooth boundary.

B22t—13 to 32 inches; yellowish brown (10YR 5/8) clay; common medium prominent red (2.5YR 4/6) mottles, and common medium distinct reddish yellow (7.5YR 6/6) mottles; strong fine and medium angular blocky and subangular blocky structure; very firm; few fine and medium roots; thick continuous clay films on faces of peds; very strongly acid; gradual smooth boundary.

B3—32 to 48 inches; mottled yellowish red (5YR 5/6) and yellowish brown (10YR 5/6) clay loam; moderate fine and medium subangular blocky structure; friable; patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

C—48 to 70 inches; mottled yellowish brown (10YR 5/6), yellowish red (5YR 5/6), and pale yellow (2.5Y 7/4) soft weathered gneiss saprolite that is clay loam; common fine flakes of mica and quartz grains; strongly acid.

The solum ranges from 42 to 48 inches in thickness. It is strongly acid or very strongly acid throughout, except where the surface layer has been limed. The A horizon is 4 to 8 inches thick. Hue is 10YR, value is 4 or 5, and chroma is 2 to 4. The Bt horizon is 21 to 26 inches thick. Hue is 10YR to 5YR, value is 5, and chroma is 6 or 8. Few to common, red and brown mottles are throughout. The C horizon is mottled, and hue is 2.5YR to 10YR, value is 5 to 8, and chroma is 2 to 8. This horizon is saprolite that crushes to clay loam, loam, or sandy clay loam.

Soils that have a slightly thicker solum than that defined for the Vance series were considered as Vance soils in naming map units. Their behavior is essentially like that of Vance soils.

Wedowee series

The Wedowee series consists of deep, well drained, moderately permeable soils that formed in material derived mainly from gneiss and granite. These soils are on ridgetops and hillsides of the Piedmont Upland. Slopes range from 6 to 25 percent.

Wedowee soils are in the same landscape as Appling and Pacolet soils. Appling soils are on lower, broad stream divides and have a thicker solum than Wedowee series. Pacolet soils have a redder argillic horizon.

Typical pedon of Wedowee sandy loam in an area of Wedowee soils, 10 to 25 percent slopes, in Heard County; 4.0 miles southwest of Franklin, 600 feet south of Georgia Highway 32, and 1.0 mile northeast of Flat Rock Campground:

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

A2—4 to 7 inches; yellowish brown (10YR 5/4) sandy loam; weak medium and coarse granular structure; very friable; common fine and medium roots; few pebbles; strongly acid; gradual smooth boundary.

B1—7 to 10 inches; yellowish brown (10YR 5/4) sandy clay loam; weak medium subangular blocky structure; friable; few fine and medium roots; strongly acid; clear smooth boundary.

B2t—10 to 29 inches; yellowish red (5YR 5/6) clay; few medium distinct reddish yellow (7.5YR 6/6) mottles; moderate medium subangular blocky structure; friable; few medium roots; patchy clay films on faces of peds; strongly acid; gradual smooth boundary.

B3—29 to 34 inches; mottled yellowish red (5YR 5/6) and reddish yellow (5YR 6/6) clay loam; weak medium subangular blocky structure; friable; strongly acid; gradual wavy boundary.

Cr—34 to 42 inches; mottled yellowish red (5YR 5/6), reddish yellow (5YR 6/6), and pale yellow (2.5Y 7/4) weathered granite that crushes to loamy sand; rock controlled structure; friable; strongly acid.

The solum ranges from 20 to 40 inches in thickness. It is strongly acid or very strongly acid throughout, except where the surface layer has been limed. The A horizon is 3 to 7 inches thick. Hue is 10YR or 7.5YR, value is 4 or 5, and chroma is 2 to 4. The Bt horizon is 10 to 19 inches thick. Hue is 5YR to 10YR, value is 5, and chroma is 6 or 8. This horizon is clay or clay loam.

Wickham series

The Wickham series consists of deep, well drained, moderately permeable soils that formed in loamy sediment. These soils are on stream terraces in the Piedmont Upland. Slopes range from 2 to 10 percent.

Wickham soils are in the same landscape as Altavista and Roanoke soils. Altavista and Roanoke soils are commonly on lower stream terraces than Wickham soils. Altavista soils are moderately well drained, but Roanoke soils are poorly drained. Also, Roanoke soils are covered with a thin layer of recent overwash material.

Typical pedon of Wickham fine sandy loam, 2 to 6 percent slopes, in a pine plantation of Troup County; 2.0 miles southwest of Hogansville, 150 feet north of Mobley Bridge Road, and 300 feet east of Yellow Jacket Creek:

Ap1—0 to 3 inches; brown (10YR 4/3) fine sandy loam; weak medium granular structure; very friable; many fine roots; medium acid; clear smooth boundary.

Ap2—3 to 8 inches; dark yellowish brown (10YR 4/4) and brown (10YR 4/3) fine sandy loam; weak medium granular structure; very friable; many fine roots; medium acid; clear smooth boundary.

B21t—8 to 20 inches; reddish brown (5YR 5/4) sandy clay loam; weak medium subangular blocky structure; friable; common fine roots; common fine pores; patchy clay films on faces of peds; strongly acid; clear smooth boundary.

B22t—20 to 36 inches; red (2.5YR 4/6) sandy clay loam; few fine distinct light yellowish brown mottles; moderate medium subangular blocky structure; friable; few fine roots; patchy clay films on faces of ped; strongly acid; gradual smooth boundary.

B23t—36 to 50 inches; yellowish red (5YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; few fine roots; patchy clay films on faces of peds; strongly acid; gradual smooth boundary.

B3—50 to 58 inches; yellowish red (5YR 5/6) coarse sandy clay loam; weak medium subangular blocky structure; friable; few fine flakes of mica; strongly acid; clear smooth boundary.

C—58 to 72 inches; yellowish red (5YR 5/6) coarse sandy clay loam; common medium distinct pale brown (10YR 6/3) mottles; massive; friable; common fine flakes of mica and water-rounded gravel; strongly acid.

The solum ranges from 40 to 60 inches in thickness. It is medium acid to very strongly acid throughout, except where the surface layer has been limed. The A horizon is 5 to 10 inches thick. Hue is 7.5YR or 10YR, value is 4 or 5, and chroma is 3 or 4. The Bt horizon is 29 to 42 inches thick. Hue is 2.5YR or 5YR, value is 4 to 6, and chroma is 4 to 8. This horizon is sandy clay loam or clay loam.

Wilkes series

The Wilkes series consists of shallow, well drained, moderately slowly permeable soils that formed in material derived mainly from basic igneous and metamorphic rock. These soils are on ridgetops and hillsides of the Piedmont Upland. Slopes range from 4 to 35 percent.

Wilkes soils are in the same landscape as Helena and Vance soils. Helena and Vance soils are deeper than the Wilkes soils. The Helena soils are smoother, lower soils and are less well drained than the Wilkes soils. Vance soils commonly are less sloping.

Typical pedon of Wilkes gravelly sandy loam, 4 to 10 percent slopes, in an idle field of Troup County; 4.0 miles southeast of La Grange, along John Lovelace Road, and 600 feet north of Panther Creek:

Ap—0 to 5 inches; brown (10YR 5/3) gravelly sandy loam; weak medium granular structure; very friable; many fine roots; about 15 to 20 percent, by volume, quartz pebbles; slightly acid; clear smooth boundary.

B1—5 to 10 inches; light yellowish brown (10YR 6/4) sandy clay loam; common medium distinct strong brown (7.5YR 5/6) mottles; weak medium subangular blocky structure; friable; many fine roots; common very fine and fine pores; medium acid; clear smooth boundary.

B2t—10 to 16 inches; strong brown (7.5YR 5/8) clay; moderate medium and coarse prismatic structure; very firm; common fine roots along faces of peds; few very fine pores; thick continuous light olive brown (2.5YR 5/4) clay films on faces of peds; common fine fragments of feldspar; slightly acid; abrupt wavy boundary.

Cr—16 to 40 inches; partially weathered granitic rock that contains much quartz, feldspar, and other injected minerals that cause the rock to be green; neutral.

R—40 to 48 inches; hard bedrock.

The solum ranges from 10 to 20 inches in thickness. Depth to hard bedrock is 40 to 50 inches. It is slightly acid or medium acid throughout. The A horizon is 4 to 9 inches thick. Hue is 10YR, value is 3 to 5, and chroma is 3 or 4; or hue is 7.5YR, value is 3 to 5, and chroma is 4. The Bt horizon is 5 or 6 inches thick. Hue is 7.5YR or 10YR, value is 5, and chroma is 6 or 8. This horizon is clay loam or clay.

Formation

Glenn L. Bramlett, soil scientist, Soil Conservation Service, assisted in preparing this section.

This section discusses the factors of soil formation, relates them to soils in the survey area, and explains the processes of soil formation.

Soil forms when parent material, climate, relief, and plants and animals interact for a period of time (*5*). These factors determine the nature of the soil that forms at any point on the earth. All of these factors affect the formation of each soil, but the relative importance of each factor differs from place to place. In some areas, one factor may dominate in the formation of a soil and determine most of the properties. For example, soils that formed in quartz sand generally have a faint horizon because quartz sand is highly resistant to weathering. Even in quartz sand, however, a distinct profile can be formed under certain types of vegetation, if the relief is low and flat and if the water table is high. The five factors of soil formation are discussed in the following paragraphs.

Parent material

Parent material is the unconsolidated mass in which a soil forms. It largely determines the chemical and mineralogical composition of soils. The soils of Coweta, Heard, and Troup Counties formed in two kinds of parent material: (1) residual material weathered in place from rock, and (2) material transported by water and laid down as deposits of clay, silt, sand, and larger rock fragments.

The soils that formed in residual material are generally related to particular rock formations or parts of rock formations (*4*). For example, the Cecil and Appling soils were derived from ordinary gneiss, granite, and schist; the Madison soils were derived from mica schist; and the Gwinnett soils were derived from diorite and hornblende or mixed acid and basic rock.

Transported soil material, or alluvium, has been moved from one place to another by water. This alluvium is deposited in the valleys of flowing streams. Older deposits are on high terraces along former streambeds that are now dry. Soils that formed in alluvium on first bottoms show little profile development, whereas soils on former streambeds have been in place long enough for distinct horizons to develop. Transported soil material is mixed and sorted by the stream and deposited in strata as the flow of water changes speed. Chewacla soil formed in alluvium. The transported soil material has properties similar to those of the soil from which it was removed. For example, soils on bottom lands that formed in soil material washed from mica schist on uplands contain large amounts of mica.

A fairly consistent relationship exists between the parent material and soil characteristics. However, some soil characteristics cannot be correlated with the kind of parent material and, therefore, must be attributed to other factors.

Climate

Climate affects the formation of soils through its influence on the rate of weathering of rock and the decomposition of minerals and organic matter. It also affects biological activity in the soils and the leaching and movement of weathered material.

Coweta, Heard, and Troup Counties have a moist, temperate climate. They have an average daily minimum temperature of about 34 degrees F in January and an average daily maximum temperature of about 90 degrees F in July. The warm, moist climate promotes rapid weathering of rock. Consequently, in much of the area, the soils are 3 to 6 feet thick over a thick layer of loose, disintegrated, weathered rock which blankets the hard rock underlying the counties.

Annual precipitation is about 52 inches. Much of the water percolates through the soil and moves dissolved or suspended material downward, leaving the soils generally low in bases. Plant remains decay rapidly and produce organic acids that help to hasten the breakdown of minerals in the underlying rock. Thus, the organic-matter content is low in the surface layer of soils that have good drainage. Because the climate is fairly uniform over the survey area, one soil cannot be set apart from another because of climatic influences alone.

Relief

Relief influences soil formation through its effect on runoff, movement of water within the soil, plant cover, and to some extent, soil temperature.

The length, shape, steepness, and aspect of slopes hasten or delay runoff. Runoff is more rapid on steep slopes; therefore, steep soils erode faster than level ones, even if both are of the same material. For example, soils on steep slopes underlain by rock generally are thinner and have a more weakly expressed profile than soils that formed in similar material on broad, fairly level ridgetops. Rock outcrop also is more common.

A level or nearly level surface allows more time for water to penetrate and percolate through the soil profile. This in turn influences the solution and translocation of soluble material. The moisture available in the soil also determines to a significant extent the amount and kinds of plants that grow. Thus, steep soils that have a slowly permeable surface layer are generally drier than level or nearly level soils, and less vegetation grows on them.

The soils of Coweta, Heard, and Troup Counties range from nearly level to steep, but are not extremely hilly. The effect of relief on soil temperature, therefore, is not so pronounced as in more mountainous areas. Generally, however, south-facing slopes are warmer than north-facing slopes.

Plants and animals

Plants, animals, bacteria, and other organisms are active in soil-forming processes. The changes they bring about depend mainly on the kinds of life processes peculiar to each. The kinds of plants and animals that live on and in the soil are affected, in turn, by the climate, parent material, relief, and age of the soil.

Most of the soil in Coweta, Heard, and Troup Counties formed under forest consisting of various kinds of hardwoods and of such softwoods as pines. These trees supply most of the organic matter available in the soils, though the hardwoods contribute more than the softwoods. The organic-matter content in most of the soils is low to medium.

Plants provide a cover that helps to reduce erosion and stabilize the surface so that the soil-forming processes can continue. Leaves, twigs, roots, and entire plants accumulate on the surface of forest soils and then decompose as the result of the action of percolating water and of micro-organisms, earthworms, and other forms of life. The roots of plants widen cracks in rocks permitting more water to enter. Also, the uprooting of trees by wind decidedly influences formation of soils through the mixing of soil layers and the loosening of underlying material.

Small animals, earthworms, insects, and micro-organisms also influence the formation of soils by mixing organic matter into the soil. They accelerate the formation of organic matter by breaking down the remains of plants. Small animals burrow into the soil and thus mix the layers. Earthworms and other small invertebrates feed on the organic matter in the upper few inches. They slowly but continually mix the soil material and may alter it chemically. Bacteria, fungi, and other micro-organisms hasten the weathering of rock and the decomposition of organic matter.

Time

Generally, a long time is required for a soil to form. Most of the soils on uplands in Coweta, Heard, and Troup Counties have been in place long enough for distinct horizons to develop, but those that formed in alluvium have not.

Most soils in the survey area have distinct horizons. The surface layer contains an accumulation of organic matter, and silicate clay minerals formed and moved downward to develop horizons that are relatively high in clay. Also, in such soils, oxidation or reduction of iron has had its effect, depending on natural drainage. Many of the soils have been drained well enough to have a red or dark red subsoil that contains highly oxidized iron. Few soils have had impaired drainage, and consequently, have a gray subsoil that is reduced in iron. In addition, leaching of soluble calcium, magnesium, potassium, and other weath-

erable products has caused an increase in exchangeable hydrogen. Cecil and Madison soils are examples of these older soils.

The soils that have essentially the same parent material and drainage sometimes differ in degree of profile development, chiefly because of time. Examples of these are the Altavista soils on stream terraces and the Riverview soils on flood plains. These soils are similar in texture. The Altavista soils, however, have been in place long enough to have a distinct, dark colored surface layer and a subsoil that has an accumulation of clay. The Riverview soils, however, have not been in place long enough for distinct horizons to develop.

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Glossary

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim. An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single mapping unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 3
Low	3 to 6
Medium	6 to 9
High	More than 9

Base saturation. The degree to which material having base exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bottom land. The normal flood plain of a stream, subject to frequent flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coat, clay skin.

Coarse fragments. Mineral or rock particles up to 3 inches (2 millimeters to 7.5 centimeters) in diameter.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures is difficult.

Complex, soil. A map unit of two or more kinds of soil occurring in such an intricate pattern that they cannot be shown separately on a soil map at the selected scale of mapping and publication.

Compressible. Excessive decrease in volume of soft soil under load.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.
Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.
Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.
Soft.—When dry, breaks into powder or individual grains under very slight pressure.
Cemented.—Hard; little affected by moistening.

Contour stripcropping (or contour farming). Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is 40 or 80 inches (1 or 2 meters).

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Depth to rock. Bedrock at a depth that adversely affects the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:
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 for long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.
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, as for example in "hillpeats" and "climatic moors."

Drainage, surface. Runoff, or surface flow of water, from an area.

Erosion. The wearing away of the land surface by running water, wind, ice, or other geologic agents and by such processes as gravitational creep.
Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.
Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes a bare surface.

Excess fines. Excess silt and clay. The soil does not provide a source of gravel or sand for construction purposes.

Favorable. Favorable soil features for the specified use.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light,

moisture, temperature, tilth, and other growth factors are favorable.

Flooding. The temporary covering of soil with water from overflowing streams, runoff from adjacent slopes, and tides. Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *occasional* that it occurs on an average of once or less in 2 years; and *frequent* that it occurs on an average of more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; *November-May*, for example, means that flooding can occur during the period November through May. Water standing for short periods after rainfall or commonly covering swamps and marshes is not considered flooding.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Forage. Plant material used as feed by domestic animals. Forage can be grazed or cut for hay.

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.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material from 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.5 centimeters) in diameter.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Habitat. The natural abode of a plant or animal; refers to the kind of environment in which a plant or animal normally lives, as opposed to the range or geographical distribution.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. The major horizons of mineral soil are as follows:

O horizon.—An organic layer, fresh and decaying plant residue, at the surface of a mineral soil.

A horizon.—The mineral horizon, formed or forming at or near the surface, in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon most of which was originally part of a B horizon.

A2 horizon.—A mineral horizon, mainly a residual concentration of sand and silt high in content of resistant minerals as a result of the loss of silicate clay, iron, aluminum, or a combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or a combination of these; (2) by prismatic or blocky structure; (3) by redder or browner colors than those in the A horizon; or (4) by a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that from which the solum is presumed to have formed. If the material is known to differ from that in the solum the Roman numeral II precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered, but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

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.

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.
Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.
Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.
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.
Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.
Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Large stones. Rock fragments 10 inches (25 centimeters) or more across. Large stones adversely affect the specified use.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. Inadequate strength for supporting loads.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is greater than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Neutral soil. A soil having a pH value between 6.6 and 7.3.

Nutrient, plant. Any element taken in by a plant, essential to its growth, and used by it in the production of food and tissue. Plant nutrients are nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, zinc, and perhaps other elements obtained from the soil; and carbon, hydrogen, and oxygen obtained largely from the air and water.

Parent material. The great variety of unconsolidated organic and mineral material in which soil forms. Consolidated bedrock is not yet parent material by this concept.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly. The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality that enables the soil to transmit water or air, measured as the number of inches per hour that water moves through the soil. Terms describing permeability are *very slow* (less than 0.06 inch), *slow* (0.06 to 0.20 inch), *moderately slow* (0.2 to 0.6 inch), *moderate* (0.6 to 2.0 inches), *moderately rapid* (2.0 to 6.0 inches), *rapid* (6.0 to 20 inches), and *very rapid* (more than 20 inches).

Phase, soil. A subdivision of a soil series or other unit in the soil classification system based on differences in the soil that affect its management. A soil series, for example, may be divided into phases on the bases of differences in slope, stoniness, thickness, or some other characterisitc that affects management. These differencees are too small to justify separate series.

pH value. (See Reaction, soil). A numerical designation of acidity and alkalinity in soil.

Piping. Moving water of subsurface tunnels or pipelike cavities in the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from a semisolid to a plastic state.

Poor outlets. Surface or subsurface drainage outlets difficult or expensive to install.

Productivity (soil). The capability of a soil for producing a specified plant or sequence of plants under a specified system of management. Productivity is measured in terms of output, or harvest, in relation to input.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it

is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulates over disintegrating rock.

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.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth. Shallow root zone. The soil is shallow over a layer that greatly restricts roots. See Root zone.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged in stream channels from a drainage area. The water that flows off the land surface without sinking in is called surface runoff; that which enters the ground before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Saprolite (geology). Soft, earthy, clay-rich, thoroughly decomposed rock formed in place by chemical weathering of igneous and metamorphic rock. In soil survey, the term saprolite is applied to any unconsolidated residual material underlying the soil and grading to hard bedrock below.

Seepage. The rapid movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils, formed from a particular type of parent material, having horizons that, except for the texture of the A or surface horizon, are similar in all profile characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistence, and mineralogical and chemical composition.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

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.

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.

Slow intake. The slow movement of water into the soil.

Small stones. Rock fragments 3 to 10 inches (7.5 to 25 centimeters) in diameter. Small stones adversely affect the specified use.

Soil. A natural, three-dimensional body at the earth's surface that is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in mature soil consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristics of the soil are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stratified. Arranged in strata, or layers. The term refers to geologic material. Layers in soils that result from the processes of soil formation are called horizons; those inherited from the parent material are called strata.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates that are separated from adjoining aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower

in content of organic matter than the overlying surface layer.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use or management.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that it can soak into the soil or flow slowly to a prepared outlet without harm. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea. A stream terrace is frequently called a second bottom, in contrast with a flood plain, and is seldom subject to overflow. A marine terrace, generally wide, was deposited by the sea.

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, silt loam, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or " very fine."

Thin layer. Otherwise suitable soil material too thin for the specified use.

Tilth, soil. The condition of the soil, especially the soil structure, as related to the growth of plants. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Topsoil (engineering). Presumably a fertile soil or soil material, or one that responds to fertilization, ordinarily rich in organic matter, used to topdress roadbanks, lawns, and gardens.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Water table. The upper limit of the soil or underlying rock material that is wholly saturated with water.

Water table, apparent. A thick zone of free water in the soil. An apparent water table is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.

Water table, perched. A water table standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

ILLUSTRATIONS

Figure 1.—Riverview map unit on nearly level flood plain. Conservation tillage helps maintain soil structure.

Figure 2.—Typical hillside landscape of Madison-Louisa map unit. Improved pasture on less sloping Madison soils and well managed woodland on steeper hillsides help control erosion and reduce runoff.

Figure 3.—Appling sandy clay loam, 6 to 10 percent slopes, eroded. Erosion has created gullies. Poor tilth, lowered fertility levels, reduced infiltration, and increased runoff are the result.

Figure 4.—Soybeans on Cecil sandy loam, 2 to 6 percent slopes.

Figure 5.—Woodland on Louisa gravelly fine sandy loam, 15 to 40 percent slopes.

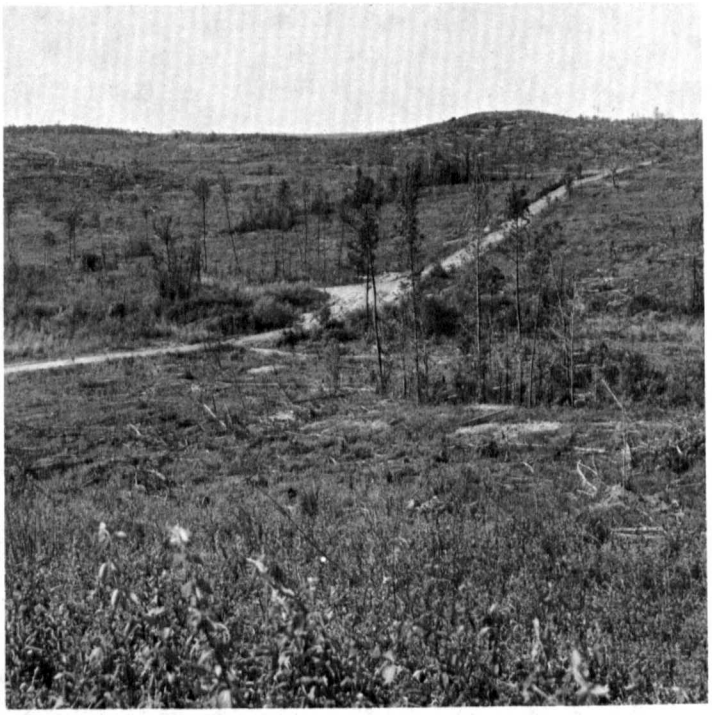

Figure 6.—Area of Pacolet sandy clay loam, 15 to 25 percent slopes, eroded. This area has been cleared and will be planted to loblolly pine.

Figure 7.—Dairy cattle grazing tall fescue on Cecil sandy loam, 2 to 6 percent slopes. This soil has good potential for hay and pasture.

Figure 8.—Loblolly pine plantation on Cecil sandy loam, 2 to 6 percent slopes. This soil has fair potential for loblolly pine. It is not significantly limited for woodland use or management.

Figure 9.—Sprinkler irrigation of corn on Cecil sandy loam, 2 to 6 percent slopes.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION DATA

Month	Temperature[1]						Precipitation[1]				
	Average daily maximum	Average daily minimum	Average	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days[2]	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	F	F	F	F	F	Units	In	In	In		In
January----	55.3	33.9	44.7	74	8	61	5.19	3.25	6.94	9	.3
February---	59.2	35.6	47.4	78	11	87	4.84	3.00	6.50	7	.1
March------	66.6	41.5	54.1	85	20	194	5.70	3.77	7.46	9	.0
April------	76.3	50.0	63.2	89	31	396	4.94	3.06	6.62	6	.0
May--------	82.8	57.6	70.2	94	39	626	4.24	2.09	5.98	6	.0
June-------	87.8	64.1	76.0	98	50	780	4.26	2.72	5.63	7	.0
July-------	89.9	67.0	78.5	99	57	884	4.92	2.86	6.59	9	.0
August-----	89.6	66.4	78.0	97	56	868	3.86	2.11	5.28	6	.0
September--	84.4	61.7	73.1	96	46	693	3.30	1.57	4.71	5	.0
October----	75.5	50.8	63.2	90	30	409	2.89	.67	4.66	4	.0
November---	65.1	41.0	53.1	82	19	128	3.46	2.07	4.70	6	.0
December---	57.0	35.6	46.3	76	11	71	4.78	2.50	6.65	7	.0
Year-----	74.1	50.4	62.3	100	6	5,197	52.38	45.06	59.44	81	.4

[1]Recorded in the period 1951-75 at Newnan, Ga.

[2]A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

Probability	Temperature[1]		
	24°F or lower	28°F or lower	32°F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	March 31	April 8	April 13
2 years in 10 later than--	March 21	March 1	April 8
5 years in 10 later than--	February 1	March 17	March 29
First freezing temperature in fall:			
1 year in 10 earlier than--	November 7	November 29	October 18
2 years in 10 earlier than--	November 13	November 3	October 23
5 years in 10 earlier than--	December 26	November 12	November 2

[1]Recorded in the period 1951-75 at Newnan, Ga.

TABLE 3.--GROWING SEASON LENGTH

Probability	Daily minimum temperature during growing season[1]		
	Higher than 24°F	Higher than 28°F	Higher than 32°F
	Days	Days	Days
9 years in 10	227	212	197
8 years in 10	242	222	204
5 years in 10	268	240	217
2 years in 10	295	258	230
1 year in 10	309	267	237

[1]Recorded in the period 1951-75 at Newnan, Ga.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Coweta County	Heard County	Troup County	Total--	
					Area	Extent
		Acres	Acres	Acres	Acres	Pct
AkB	Altavista fine sandy loam, 2 to 6 percent slopes	645	540	610	1,795	0.2
AmB	Appling sandy loam, 2 to 6 percent slopes	11,290	2,425	4,490	18,205	2.5
AmC	Appling sandy loam, 6 to 10 percent slopes	7,450	3,890	2,870	14,210	1.9
AmD	Appling sandy loam, 10 to 15 percent slopes	2,545	3,420	620	6,585	0.9
AnC2	Appling sandy clay loam, 6 to 10 percent slopes, eroded	1,095	450	645	2,190	0.3
CeB	Cecil sandy loam, 2 to 6 percent slopes	20,695	2,870	20,760	44,325	6.0
CeC	Cecil sandy loam, 6 to 10 percent slopes	28,270	8,180	33,155	69,605	9.4
CeD	Cecil sandy loam, 10 to 15 percent slopes	18,490	9,805	23,740	52,035	7.0
CfC2	Cecil sandy clay loam, 6 to 10 percent slopes, eroded	16,115	4,280	23,530	43,925	5.9
CfD2	Cecil sandy clay loam, 10 to 15 percent slopes, eroded	13,705	6,260	26,960	46,925	6.4
CuC	Cecil-Urban land complex, 2 to 10 percent slopes	0	0	7,185	7,185	1.0
CuE	Cecil-Urban land complex, 10 to 25 percent slopes	0	0	890	890	0.1
DgB	Davidson loam, 2 to 6 percent slopes	2,200	145	3,995	6,340	0.9
GwC2	Gwinnett sandy clay loam, 6 to 10 percent slopes, eroded	655	225	8,395	9,275	1.3
GwD2	Gwinnett sandy clay loam, 10 to 15 percent slopes, eroded	860	295	5,260	6,415	0.9
HyB	Helena sandy loam, 2 to 6 percent slopes	1,460	25	365	1,850	0.3
HyC	Helena sandy loam, 6 to 10 percent slopes	335	50	60	445	0.1
LoD	Louisa gravelly fine sandy loam, 6 to 15 percent slopes	360	1,770	35	2,165	0.3
LoF	Louisa gravelly fine sandy loam, 15 to 40 percent slopes	960	14,620	785	16,365	2.2
MdB	Madison gravelly sandy loam, 2 to 6 percent slopes	16,885	1,610	2,675	21,170	2.9
MdC	Madison gravelly sandy loam, 6 to 10 percent slopes	25,210	12,255	7,065	44,530	6.0
MdE	Madison gravelly sandy loam, 15 to 25 percent slopes	8,270	17,665	6,075	32,010	4.3
MfC2	Madison gravelly sandy clay loam, 6 to 10 percent slopes, eroded	10,935	3,930	4,590	19,455	2.6
MfD2	Madison gravelly sandy clay loam, 10 to 15 percent slopes, eroded	33,455	22,985	11,505	67,945	9.2
MuC	Madison-Urban land complex, 2 to 10 percent slopes	2,225	3,180	0	5,405	0.7
MuE	Madison-Urban land complex, 10 to 25 percent slopes	490	0	0	490	0.1
MvC2	Musella clay loam, 6 to 10 percent slopes, eroded	75	375	115	565	0.1
MwE	Musella stony clay loam, 10 to 25 percent slopes	550	3,185	1,215	4,950	0.7
PgC2	Pacolet sandy clay loam, 6 to 10 percent slopes, eroded	240	1,020	900	2,160	0.3
PgD2	Pacolet sandy clay loam, 10 to 15 percent slopes, eroded	0	6,310	7,110	13,420	1.8
PgE2	Pacolet sandy clay loam, 15 to 25 percent slopes, eroded	12,145	17,340	25,020	54,505	7.4
PhE3	Pacolet-Udorthents complex, gullied	190	145	560	895	0.1
PUF	Pacolet soils, 15 to 40 percent slopes	5,600	12,625	1,875	20,100	2.7
Rh	Riverview loam	2,545	5,745	4,680	12,970	1.8
RK	Riverview-Chewacla association	27,660	12,510	21,195	61,365	8.3
Ro	Roanoke silty clay loam, overwash	2,500	335	1,585	4,420	0.6
Rx	Rock outcrop, granite	135	800	15	950	0.1
Ud	Urban land	210	0	1,525	1,735	0.2
VaB	Vance sandy loam, 2 to 6 percent slopes	390	65	1,065	1,520	0.2
VaC	Vance sandy loam, 6 to 10 percent slopes	240	250	555	1,045	0.1
WeC	Wedowee sandy loam, 6 to 10 percent slopes	820	1,425	610	2,855	0.4
WEE	Wedowee soils, 10 to 25 percent slopes	3,707	4,360	180	8,247	1.1
WhB	Wickham fine sandy loam, 2 to 6 percent slopes	525	975	315	1,815	0.3
WhC	Wickham fine sandy loam, 6 to 10 percent slopes	215	600	150	965	0.1
WvC	Wilkes gravelly sandy loam, 4 to 10 percent slopes	320	280	365	965	0.1
WvF	Wilkes gravelly sandy loam, 10 to 35 percent slopes	405	860	305	1,570	0.2
	[1] Total	283,072	190,080	265,600	738,752	100.0

[1] Areas of water greater than 40 acres total 23,435 acres. These areas are not included in the table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE

[All yields were estimated for a high level of management in 1976. Absence of a yield figure indicates the crop is seldom grown or is not suited]

Soil name and map symbol	Corn	Cotton lint	Soybeans	Wheat	Oats	Tall fescue	Improved bermudagrass
	Bu	Lb	Bu	Bu	Bu	AUM[1]	AUM[1]
AkB--- Altavista	110	650	40	55	70	8.0	9.5
AmB--- Appling	95	650	35	45	80	7.5	9.0
AmC--- Appling	80	600	30	40	75	7.0	8.0
AmD--- Appling	70	500	25	35	65	6.5	7.0
AnC2--- Appling	60	450	25	35	70	5.5	6.0
CeB--- Cecil	95	750	45	---	90	7.5	9.0
CeC--- Cecil	90	700	40	---	85	7.0	8.0
CeD--- Cecil	80	600	35	---	75	6.5	7.0
CfC2--- Cecil	60	450	30	---	60	5.5	6.0
CfD2--- Cecil	---	---	---	---	---	4.5	5.0
CuC--- Cecil	---	---	---	---	---	---	---
CuE--- Cecil	---	---	---	---	---	---	---
DgB--- Davidson	110	750	45	---	90	8.5	10.0
GwC2--- Gwinnett	65	450	35	---	65	5.5	7.5
GwD2--- Gwinnett	---	---	---	---	---	4.0	6.5
HyB--- Helena	75	575	25	---	65	6.0	7.0
HyC--- Helena	65	475	20	---	55	5.5	6.0
LoD--- Louisa	---	---	---	---	---	3.0	4.5
LoF--- Louisa	---	---	---	---	---	---	---
MdB--- Madison	90	700	40	---	85	7.0	8.5
MdC--- Madison	80	600	35	---	75	6.5	7.5

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Cotton lint	Soybeans	Wheat	Oats	Tall fescue	Improved bermudagrass
	Bu	Lb	Bu	Bu	Bu	AUM[1]	AUM[1]
MdE---------- Madison	---	---	---	---	---	5.0	6.0
MfC2---------- Madison	80	600	35	---	75	6.5	7.5
MfD2---------- Madison	70	500	30	---	60	5.5	6.5
MuC---------- Madison	---	---	---	---	---	---	---
MuE---------- Madison	---	---	---	---	---	---	---
MvC2---------- Musella	60	450	20	---	65	5.0	8.0
MwE---------- Musella	---	---	---	---	---	---	---
PgC2---------- Pacolet	50	450	20	---	30	5.0	6.0
PgD2---------- Pacolet	---	---	---	---	---	4.5	5.0
PgE2---------- Pacolet	---	---	---	---	---	---	---
PhE3---------- Pacolet	---	---	---	---	---	---	---
PUF---------- Pacolet	---	---	---	---	---	---	---
Rh---------- Riverview	80	---	30	---	70	7.0	8.0
RK**:							
Riverview----------	80	---	30	---	70	7.0	8.0
Chewacla----------	80	---	30	---	40	8.0	9.0
Ro---------- Roanoke	---	---	---	---	---	5.0	---
Rx**: Rock outcrop							
Ud**: Urban land							
VaB---------- Vance	80	500	35	60	65	6.0	7.0
VaC---------- Vance	75	400	30	55	60	5.5	6.0
WeC---------- Wedowee	75	450	25	35	75	6.5	7.5
WEE---------- Wedowee	---	---	---	---	---	4.0	5.0
WhB---------- Wickham	115	750	45	60	80	8.0	9.5

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Cotton lint	Soybeans	Wheat	Oats	Tall fescue	Improved bermuda-grass
	Bu	Lb	Bu	Bu	Bu	AUM*	AUM*
WhC---------- Wickham	105	650	40	55	70	7.5	9.0
WvC---------- Wilkes	65	400	25	35	60	5.5	6.0
WvF---------- Wilkes	---	---	---	---	---	---	---

* Animal-unit-month: The number of months one acre will provide grazing for one animal unit (one cow, one horse, one mule, five sheep, or five goats).
** See map unit description for the composition and behavior of the map unit.

TABLE 6.--CAPABILITY CLASSES AND SUBCLASSES

[Miscellaneous areas excluded. Absence of an entry means no acreage]

Class	Total acreage	Major management concerns (Subclass)			
		Erosion (e)	Wetness (w)	Soil problem (s)	Climate (c)
		Acres	Acres	Acres	Acres
I	---	---	---	---	---
II	108,470	95,500	12,970	---	---
III	146,720	146,720	---	---	---
IV	199,565	137,235	61,365	965	---
V	4,420	---	4,420	---	---
VI	233,012	233,012	---	---	---
VII	43,880	42,310	---	1,570	---
VIII	---	---	---	---	---

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed in this table. Absence of an entry in a column means the information was not available. Site index was calculated at age 30 for eastern cottonwood, at age 35 for American sycamore, and at age 50 for all other species]

Soil name and map symbol	Ordination symbol	Management concerns			Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Important trees	Site index	
AkB Altavista	2w	Slight	Moderate	Slight	Loblolly pine Shortleaf pine Sweetgum White oak	91 77 84 ---	Loblolly pine, yellow-poplar, black walnut, sweetgum, American sycamore, cherrybark oak.
AmB, AmC, AmD, AnC2 Appling	3o	Slight	Slight	Slight	Loblolly pine Shortleaf pine Scarlet oak Southern red oak Virginia pine White oak Yellow-poplar	81 65 68 76 74 71 90	Eastern redcedar, eastern white pine, loblolly pine, yellow-poplar, American sycamore.
CeB, CeC, CeD Cecil	3o	Slight	Slight	Slight	Eastern white pine Loblolly pine Shortleaf pine Virginia pine Black oak Northern red oak Scarlet oak	80 80 69 73 66 82 80	Eastern white pine, loblolly pine, yellow-poplar.
CfC2, CfD2 Cecil	4c	Moderate	Moderate	Moderate	Loblolly pine Shortleaf pine	72 66	Loblolly pine.
CuC*: Cecil	3o	Slight	Slight	Slight	Eastern white pine Loblolly pine Shortleaf pine Virginia pine Black oak Northern red oak Post oak Scarlet oak	80 80 69 73 66 82 65 80	Eastern white pine, loblolly pine, slash pine, yellow-poplar.
Urban land.							
CuE*: Cecil	3r	Moderate	Moderate	Slight	Eastern white pine Loblolly pine Shortleaf pine Virginia pine Black oak Northern red oak Post oak Scarlet oak	80 80 69 73 66 82 65 80	Eastern white pine, loblolly pine, yellow pine, American sycamore.
Urban land.							
DgB Davidson	3o	Slight	Slight	Slight	Loblolly pine Shortleaf pine Northern red oak Southern red oak Sweetgum White oak Yellow-poplar	81 68 86 72 80 71 80	Loblolly pine, yellow-poplar, cherrybark oak.
GwC2, GwD2 Gwinnett	4c	Moderate	Moderate	Moderate	Loblolly pine Virginia pine Shortleaf pine	75 65 65	Eastern redcedar, loblolly pine, Virginia pine.

See footnote 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	Important trees	Site index	
HyB, HyC---------- Helena	3w	Slight	Moderate	Slight	Loblolly pine---------- Shortleaf pine--------- White oak---------- Yellow-poplar----------	80 63 64 87	Loblolly pine, Virginia pine, yellow-poplar.
LoD---------- Louisa	4o	Slight	Slight	Slight	Loblolly pine---------- Shortleaf pine--------- Southern red oak------- Yellow-poplar---------- Longleaf pine----------	72 67 70 85 67	Loblolly pine, eastern redcedar.
LoF---------- Louisa	4r	Moderate	Moderate	Slight	Loblolly pine---------- Shortleaf pine--------- Southern red oak------- Yellow-poplar---------- Longleaf pine----------	72 67 70 85 67	Loblolly pine, eastern redcedar.
MdB, MdC---------- Madison	3o	Slight	Slight	Slight	Loblolly pine---------- Longleaf pine--------- Shortleaf pine--------- Southern red oak------- Yellow-poplar----------	73 63 66 81 96	Loblolly pine, yellow-poplar.
MdE---------- Madison	3r	Moderate	Moderate	Slight	Loblolly pine---------- Longleaf pine--------- Shortleaf pine--------- Southern red oak------- Yellow-poplar----------	73 63 66 81 96	Loblolly pine, yellow-poplar.
MfC2, MfD2--------- Madison	4c	Moderate	Moderate	Moderate	Loblolly pine---------- Longleaf pine--------- Shortleaf pine---------	72 60 66	Loblolly pine.
MuC*: Madison---------- Urban land.	3o	Slight	Slight	Slight	Loblolly pine---------- Longleaf pine--------- Shortleaf pine--------- Southern red oak------- Yellow-poplar----------	73 63 66 81 96	Loblolly pine, yellow-poplar.
MuE*: Madison---------- Urban land.	3r	Moderate	Moderate	Slight	Loblolly pine---------- Longleaf pine--------- Shortleaf pine--------- Southern red oak------- Yellow-poplar----------	73 63 66 81 96	Loblolly pine, yellow-poplar.
MvC2---------- Musella	3o	Slight	Slight	Slight	Loblolly pine---------- Virginia pine----------	80 75	Loblolly pine, yellow-poplar.
MwE---------- Musella	4x	Slight	Moderate	Moderate	Loblolly pine---------- Virginia pine----------	72 65	Loblolly pine, Virginia pine.
PgC2, PgD2--------- Pacolet	4c	Moderate	Moderate	Moderate	Loblolly pine---------- Shortleaf pine--------- Yellow-poplar----------	70 60 80	Loblolly pine, yellow-poplar.
PgE2---------- Pacolet	4c	Severe	Severe	Severe	Loblolly pine---------- Shortleaf pine--------- Yellow-poplar----------	70 60 80	Loblolly pine, yellow-poplar.

See footnote 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	Important trees	Site index	
PhE3*:							
Pacolet	4c	Severe	Severe	Severe	Loblolly pine Shortleaf pine Yellow-poplar	70 60 80	Loblolly pine, yellow-poplar.
Udorthents.							
PUF*: Pacolet	3r	Moderate	Moderate	Slight	Loblolly pine Shortleaf pine Yellow-poplar	78 70 90	Loblolly pine, yellow-poplar.
Rh Riverview	1o	Slight	Moderate	Moderate	Yellow-poplar Loblolly pine Sweetgum	110 97 100	Loblolly pine, eastern cottonwood, sweetgum, yellow-poplar, American sycamore, cherrybark oak.
RK*:							
Riverview	1o	Slight	Moderate	Moderate	Yellow-poplar Loblolly pine Sweetgum	110 97 100	Loblolly pine, eastern cottonwood, sweetgum, yellow-poplar, American sycamore, cherrybark oak.
Chewacla	1w	Slight	Moderate	Moderate	Loblolly pine Yellow-poplar American sycamore Sweetgum Water oak Eastern cottonwood Green ash Southern red oak	96 104 90 97 86 100 97 90	Loblolly pine, American sycamore, yellow-poplar, sweetgum, eastern white pine, green ash. green ash.
Ro Roanoke	2w	Slight	Severe	Severe	Pin oak Loblolly pine Virginia pine	85 85 65	Loblolly pine.
VaB, VaC Vance	3o	Slight	Slight	Slight	Loblolly pine Northern red oak Shortleaf pine White oak	76 --- --- ---	Loblolly pine, Virginia pine, yellow-poplar.
WeC Wedowee	3o	Slight	Slight	Slight	Loblolly pine Virginia pine Shortleaf pine Southern red oak Northern red oak White oak	80 70 70 70 70 65	Loblolly pine, Virginia pine, eastern redcedar, yellow-poplar.
WEE*: Wedowee	3r	Moderate	Moderate	Slight	Loblolly pine Virginia pine Shortleaf pine Southern red oak Northern red oak White oak	80 70 70 70 70 65	Loblolly pine, Virginia pine, eastern redcedar, yellow-poplar.
WhB, WhC Wickham	2o	Slight	Slight	Slight	Loblolly pine Yellow-poplar Southern red oak	90 100 ---	Loblolly pine, yellow-poplar, American sycamore.

See footnote 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	Important trees	Site index	
WvC---------- Wilkes	4o	Slight	Slight	Slight	Loblolly pine----------	75	Eastern redcedar, loblolly pine, Virginia pine.
					Shortleaf pine----------	63	
					Southern red oak-------	76	
					Sweetgum----------	82	
WvF---------- Wilkes	4r	Moderate	Moderate	Slight	Loblolly pine----------	75	Eastern redcedar, loblolly pine, Virginia pine.
					Shortleaf pine----------	63	
					Southern red oak-------	76	
					Sweetgum----------	82	

* See map unit description for the composition and behavior of the map unit.

TABLE 8.--BUILDING SITE DEVELOPMENT

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry means soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
AkB---------- Altavista	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: low strength.
AmB---------- Appling	Moderate: too clayey.	Slight----------	Slight----------	Moderate: slope.	Slight.
AmC, AmD, AnC2---- Appling	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
CeB---------- Cecil	Moderate: too clayey.	Slight----------	Slight----------	Moderate: slope.	Moderate: low strength.
CeC, CeD, CfC2, CfD2---------- Cecil	Moderate: too clayey.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength.
CuC*: Cecil----------	Moderate: too clayey.	Slight----------	Slight----------	Moderate: slope.	Moderate: low strength.
Urban land.					
CuE*: Cecil----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Urban land.					
DgB---------- Davidson	Moderate: too clayey.	Slight----------	Slight----------	Moderate: slope.	Moderate: low strength.
GwC2, GwD2-------- Gwinnett	Moderate: too clayey, depth to rock.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
HyB---------- Helena	Severe: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.
HyC---------- Helena	Severe: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell.
LoD---------- Louisa	Moderate: slope, small stones.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
LoF---------- Louisa	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
MdB---------- Madison	Moderate: too clayey.	Slight----------	Slight----------	Moderate: slope.	Moderate: low strength.
MdC---------- Madison	Moderate: too clayey.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength.
MdE---------- Madison	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
MfC2, MfD2-------- Madison	Moderate: too clayey.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
MuC*: Madison	Moderate: too clayey.	Slight	Slight	Moderate: slope.	Moderate: low strength.
Urban land.					
MuE*: Madison	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Urban land.					
MvC2 Musella	Moderate: depth to rock, too clayey.	Moderate: depth to rock.	Moderate: depth to rock.	Severe: slope.	Moderate: depth to rock.
MwE Musella	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
PgC2, PgD2 Pacolet	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.
PgE2 Pacolet	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
PhE3*: Pacolet	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Udorthents.					
PUF* Pacolet	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rh Riverview	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.
RK*: Riverview	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.
Chewacla	Severe: wetness, floods.	Severe: floods, wetness.	Severe: floods, wetness.	Servere: floods, wetness.	Severe: wetness, floods.
Ro Roanoke	Severe: floods, too clayey, wetness.	Severe: floods, low strength, wetness.	Severe: floods, low strength, wetness.	Severe: floods, low strength, wetness.	Severe: floods, low strength, wetness.
Rx*. Rock outcrop					
Ud*. Urban land					
VaB Vance	Severe: too clayey.	Severe: low strength.	Severe: low strength.	Severe: low strength.	Severe: low strength.
VaC Vance	Severe: too clayey.	Severe: low strength.	Severe: low strength.	Severe: slope, low strength.	Severe: low strength.
WeC Wedowee	Moderate: slope.	Moderate: slope, low strength, shrink-swell.	Moderate: slope, low strength, shrink-swell.	Severe: slope.	Moderate: slope, low strength, shrink-swell.

See footnote at end of table.

TABLE 8.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
WEE*---------- Wedowee	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
WhB---------- Wickham	Slight----------	Slight----------	Slight----------	Moderate: slope.	Moderate: floods.
WhC---------- Wickham	Moderate: slope.	Moderate: slope.	Moderate: slope.	Moderate: slope.	Moderate: floods.
WvC---------- Wilkes	Moderate: depth to rock.	Slight----------	Moderate: depth to rock.	Moderate: slope.	Slight.
WvF---------- Wilkes	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

* See map unit description for the composition and behavior of the map unit.

TABLE 9.--SANITARY FACILITIES

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms used to rate soils. Absence of an entry means soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AkB---------- Altavista	Severe: wetness.	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness, seepage.	Good.
AmB---------- Appling	Moderate: percs slowly.	Moderate: slope, seepage.	Moderate: too clayey.	Slight----------	Fair: too clayey.
AmC, AmD, AnC2------ Appling	Moderate: slope, percs slowly.	Severe: slope, seepage.	Moderate: too clayey.	Moderate: slope.	Fair: too clayey, slope.
CeB---------- Cecil	Moderate: percs slowly.	Moderate: seepage.	Severe: too clayey.	Slight----------	Fair: too clayey.
CeC, CeD, CfC2, CfD2---------- Cecil	Moderate: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Fair: too clayey.
CuC*: Cecil----------	Moderate: percs slowly.	Moderate: seepage.	Severe: too clayey.	Slight----------	Fair: too clayey.
Urban land.					
CuE*: Cecil----------	Severe: slope.	Severe: slope.	Severe: too clayey.	Severe: slope.	Poor: slope.
Urban land.					
DgB---------- Davidson	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
GwC2, GwD2---------- Gwinnett	Moderate: slope.	Severe: slope.	Moderate: too clayey, depth to rock.	Moderate: slope.	Fair: too clayey.
HyB---------- Helena	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight----------	Poor: too clayey.
HyC---------- Helena	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey.
LoD---------- Louisa	Moderate: slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: slope, small stones.
LoF---------- Louisa	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
MdB---------- Madison	Moderate: percs slowly.	Moderate: slope, seepage.	Severe: too clayey.	Slight----------	Fair: too clayey.
MdC---------- Madison	Moderate: slope, percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Fair: too clayey.

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
MdE---------- Madison	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: slope.
MfC2, MfD2---------- Madison	Moderate: slope, percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Fair: too clayey.
MuC*: Madison----------	Moderate: percs slowly.	Moderate: slope, seepage.	Severe: too clayey.	Slight----------	Fair: too clayey.
Urban land.					
MuE*: Madison----------	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: slope.
Urban land.					
MvC2---------- Musella	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Moderate: slope.	Poor: thin layer.
MwE---------- Musella	Severe: slope.	Severe: depth to rock.	Severe: depth to rock, large stones.	Severe: slope.	Poor: thin layer, large stones.
PgC2, PgD2---------- Pacolet	Moderate: percs slowly, slope.	Severe: slope.	Moderate: too clayey.	Moderate: slope.	Fair: too clayey, slope.
PgE2---------- Pacolet	Severe: slope.	Severe: slope.	Moderate: too clayey, slope.	Severe: slope.	Poor: slope.
PhE3*: Pacolet----------	Severe: slope.	Severe: slope.	Moderate: too clayey, slope.	Severe: slope.	Poor: slope.
Udorthents.					
PUF*---------- Pacolet	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Rh---------- Riverview	Severe: floods.	Severe: floods, seepage.	Severe: floods, seepage.	Severe: floods, seepage.	Fair: thin layer.
RK*: Riverview----------	Severe: floods.	Severe: floods, seepage.	Severe: floods, seepage.	Severe: floods, seepage.	Fair: thin layer.
Chewacla----------	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Good. floods, wetness.
Ro---------- Roanoke	Severe: floods, percs slowly, wetness.	Slight----------	Severe: floods, too clayey, wetness.	Severe: floods, wetness.	Poor: hard to pack, too clayey, wetness.
Rx*. Rock outcrop					

See footnote at end of table.

TABLE 9.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Ud* Urban land					
VaB---- Vance	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight----	Poor: too clayey.
VaC---- Vance	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey.
WeC---- Wedowee	Moderate: percs slowly, slope.	Severe: slope.	Moderate: too clayey.	Moderate: slope.	Fair: too clayey, area reclaim, slope.
WEE*---- Wedowee	Severe: slope.	Severe: slope.	Moderate: slope, too clayey.	Severe: slope.	Poor: slope.
WhB---- Wickham	Slight----	Moderate: slope, seepage.	Severe: seepage.	Slight----	Good.
WhC---- Wickham	Moderate: slope.	Severe: slope.	Severe: seepage.	Moderate: slope.	Fair: slope.
WvC---- Wilkes	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Slight----	Poor: thin layer.
WvF---- Wilkes	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: slope.	Poor: thin layer.

* See map unit description for the composition and behavior of the map unit.

TABLE 10.--CONSTRUCTION MATERIALS

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and "poor." Absence of an entry means soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
AkB Altavista	Poor: low strength.	Poor: excess fines.	Unsuited: excess fines.	Good.
AmB, AmC, AmD, AnC2 Appling	Fair: low strength, area reclaim.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer, area reclaim.
CeB, CeC, CeD, CfC2, CfD2 Cecil	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey.
CuC*: Cecil	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey.
Urban land.				
CuE*: Cecil	Fair: low strength.	Unsuited	Unsuited	Poor: slope.
Urban land.				
DgB Davidson	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey.
GwC2, GwD2 Gwinnett	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer.
HyB, HyC Helena	Poor: shrink-swell, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
LoD Louisa	Fair: slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: small stones.
LoF Louisa	Poor: slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, small stones.
MdB, MdC Madison	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
MdE Madison	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, thin layer.
MfC2, MfD2 Madison	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
MuC*: Madison	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
Urban land.				
MuE*: Madison	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope, thin layer.
Urban land.				

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
MvC2---------- Musella	Fair: low strength.	Unsuited: excess fines.	Poor: excess fines.	Poor: thin layer.
MwE---------- Musella	Fair: low strength.	Unsuited: excess fines.	Poor: excess fines.	Poor: thin layer, large stones.
PgC2, PgD2---------- Pacolet	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer.
PgE2---------- Pacolet	Fair: low strength, slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, slope.
PhE3*: Pacolet----------	Fair: low strength, slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, slope.
Udorthents.				
PUF*---------- Pacolet	Poor: slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, slope.
Rh---------- Riverview	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
RK*: Riverview----------	Fair: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Chewacla----------	Poor: wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Good.
Ro---------- Roanoke	Poor: area reclaim, low strength, wetness.	Poor: excess fines.	Poor: excess fines.	Poor: area reclaim, thin layer, wetness.
Rx*. Rock outcrop				
Ud*. Urban land				
VaB, VaC---------- Vance	Poor: low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer, too clayey.
WeC---------- Wedowee	Fair: low strength, shrink-swell.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope, thin layer, area reclaim.
WEE*---------- Wedowee	Fair: slope, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
WhB---------- Wickham	Good----------	Unsuited: excess fines.	Unsuited: excess fines.	Fair: thin layer.
WhC---------- Wickham	Good----------	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope, thin layer.
WvC---------- Wilkes	Fair: thin layer.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer.

See footnote at end of table.

TABLE 10.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
WvF---------- Wilkes	Fair: slope, thin layer.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: thin layer.

* See map unit description for the composition and behavior of the map unit.

TABLE 11.--WATER MANAGEMENT

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry means soil was not evaluated]

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
AkB---------- Altavista	Moderate: seepage.	Moderate: thin layer, wetness.	Slope----------	Wetness--------	Favorable------	Favorable.
AmB---------- Appling	Moderate: seepage.	Moderate: low strength.	Not needed-----	Favorable------	Favorable------	Favorable.
AmC, AmD, AnC2---- Appling	Moderate: seepage.	Moderate: low strength.	Not needed-----	Slope----------	Slope----------	Favorable.
CeB, CeC, CeD, CfC2, CfD2------- Cecil	Moderate: seepage.	Severe: compressible.	Not needed-----	Complex slope--	Complex slope	Complex slope.
CuC*, CuE*: Cecil----------	Moderate: seepage.	Severe: compressible.	Not needed-----	Complex slope--	Complex slope	Complex slope.
Urban land.						
DgB---------- Davidson	Moderate: seepage.	Moderate: hard to pack.	Not needed-----	Favorable------	Favorable------	Favorable.
GwC2---------- Gwinnett	Moderate: depth to rock, seepage.	Moderate: compressible.	Not needed-----	Slope----------	Favorable------	Favorable.
GwD2---------- Gwinnett	Moderate: depth to rock, seepage.	Moderate: compressible.	Not needed-----	Slope----------	Slope----------	Slope.
HyB---------- Helena	Moderate: depth to rock.	Moderate: shrink-swell, erodes easily.	Not needed-----	Erodes easily--	Favorable------	Favorable.
HyC---------- Helena	Moderate: depth to rock.	Moderate: shrink-swell, erodes easily.	Not needed-----	Erodes easily--	Slope----------	Slope.
LoD, LoF---------- Louisa	Severe: seepage.	Severe: seepage, piping.	Not needed-----	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
MdB---------- Madison	Moderate: seepage.	Moderate: hard to pack, piping.	Not needed-----	Favorable------	Favorable------	Favorable.
MdC, MdE, MfC2, MfD2---------- Madison	Moderate: seepage.	Moderate: hard to pack, piping.	Not needed-----	Slope, erodes easily.	Erodes easily, slope.	Slope.
MuC*: Madison----------	Moderate: seepage.	Moderate: hard to pack, piping.	Not needed-----	Slope, erodes easily.	Favorable------	Favorable.
Urban land.						
MuE*: Madison----------	Moderate: seepage.	Moderate: hard to pack, piping.	Not needed-----	Slope, erodes easily.	Erodes easily, slope.	Slope.
Urban land.						

See footnote at end of table.

TABLE 11.--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
MvC2--Musella	Severe: depth to rock, seepage.	Moderate: thin layer.	Not needed	Rooting depth, slope.	Depth to rock, rooting depth, slope.	Rooting depth, slope.
MwE--Musella	Severe: depth to rock, seepage.	Moderate: thin layer, large stones.	Not needed	Rooting depth, slope.	Depth to rock, rooting depth, large stones.	Rooting depth, slope, large stones.
PgC2, PgD2, PgE2--Pacolet	Moderate: seepage.	Moderate: hard to pack.	Not needed	Slope	Slope	Slope.
PhE3*: Pacolet	Moderate: seepage.	Moderate: hard to pack.	Not needed	Slope	Slope	Slope.
Udorthents.						
PUF*--Pacolet	Moderate: seepage.	Moderate: hard to pack.	Not needed	Slope	Slope	Slope.
Rh--Riverview	Moderate: seepage.	Moderate: piping.	Not needed	Floods	Favorable	Favorable.
RK*: Riverview	Moderate: seepage.	Moderate: piping.	Not needed	Floods	Favorable	Favorable.
Chewacla	Moderate: seepage.	Moderate: piping.	Poor outlets, floods.	Wetness, floods.	Not needed	Not needed.
Ro--Roanoke	Slight	Severe: hard to pack, wetness.	Floods, percs slowly, poor outlets.	Slow intake, wetness, percs slowly.	Not needed	Not needed.
Rx*. Rock outcrop						
Ud*. Urban land						
VaB--Vance	Slight	Moderate: hard to pack.	Not needed	Percs slowly	Percs slowly, erodes easily.	Percs slowly.
VaC--Vance	Slight	Moderate: hard to pack.	Not needed	Slope, percs slowly.	Slope, percs slowly.	Slope, percs slowly.
WEC--Wedowee	Moderate: depth to rock, seepage.	Moderate: low strength, thin layer.	Not needed	Slope	Favorable	Favorable.
WEE*--Wedowee	Moderate: depth to rock, seepage.	Moderate: low strength, thin layer.	Not needed	Slope	Slope	Slope.
WhB--Wickham	Moderate: seepage.	Slight	Not needed	Favorable	Favorable	Favorable.
WhC--Wickham	Moderate: seepage.	Slight	Not needed	Slope	Slope	Slope.
WvC--Wilkes	Severe: depth to rock.	Severe: thin layer.	Not needed	Complex slope	Depth to rock, complex slope.	Favorable.
WvF--Wilkes	Severe: depth to rock.	Severe: thin layer.	Not needed	Complex slope	Depth to rock, complex slope.	Slope.

* See map unit description for the composition and behavior of the map unit.

TABLE 12.--RECREATIONAL DEVELOPMENT

[Some of the terms used in this table to describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry means soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
AkB---- Altavista	Moderate: wetness.	Slight----	Moderate: slope, wetness.	Slight.
AmB---- Appling	Slight----	Slight----	Moderate: slope.	Slight.
AmC, AmD, AnC2---- Appling	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
CeB---- Cecil	Slight----	Slight----	Moderate: slope.	Slight.
CeC, CeD---- Cecil	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
CfC2, CfD2---- Cecil	Moderate: slope, too clayey.	Moderate: slope, too clayey.	Severe: slope.	Moderate: too clayey.
CuC*: Cecil----	Slight----	Slight----	Severe: slope.	Slight.
Urban land.				
CuE*: Cecil----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Urban land.				
DgB---- Davidson	Slight----	Slight----	Moderate: slope.	Slight.
GwC2, GwD2---- Gwinnett	Moderate: slope.	Moderate: slope.	Severe: slope, depth to rock.	Moderate: too clayey.
HyB---- Helena	Moderate: percs slowly.	Moderate: wetness.	Moderate: percs slowly.	Moderate: wetness.
HyC---- Helena	Moderate: percs slowly.	Moderate: slope, wetness.	Moderate: percs slowly, slope.	Moderate: wetness.
LoD---- Louisa	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
LoF---- Louisa	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
MdB---- Madison	Slight----	Slight----	Moderate: slope.	Slight.
MdC---- Madison	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
MdE---- Madison	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
MfC2, MfD2---- Madison	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.

See footnote at end of table.

TABLE 12.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
MuC*:				
Madison	Slight	Slight	Severe: slope.	Slight.
Urban land.				
MuE*:				
Madison	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Urban land.				
MvC2	Moderate: too clayey.	Moderate: too clayey.	Severe: slope.	Moderate: too clayey.
Musella				
MwE	Severe: slope.	Severe: slope.	Severe: slope.	Severe: too clayey, large stones.
Musella				
PgC2, PgD2	Moderate: too clayey, slope.	Moderate: too clayey, slope.	Severe: slope.	Moderate: too clayey.
Pacolet				
PgE2	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: too clayey, slope.
Pacolet				
PhE3*:				
Pacolet	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: too clayey, slope.
Udorthents.				
PUF*	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Pacolet				
Rh	Moderate: floods.	Moderate: floods.	Moderate: floods.	Slight.
Riverview				
RK*:				
Riverview	Moderate: floods.	Moderate: floods.	Moderate: floods.	Slight.
Chewacla	Severe: floods, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.
Ro	Severe: floods, wetness, percs slowly.	Severe: wetness.	Severe: floods, wetness, percs slowly.	Severe: wetness.
Roanoke				
Rx*.				
Rock outcrop				
Ud*.				
Urban land				
VaB	Moderate: percs slowly.	Slight	Moderate: percs slowly.	Slight.
Vance				
VaC	Moderate: slope, percs slowly.	Moderate: slope.	Severe: slope, percs slowly.	Slight.
Vance				
WeC	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Wedowee				

See footnote at end of table.

TABLE 12.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
WEE* Wedowee	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
WhB Wickham	Slight	Slight	Moderate: slope.	Slight.
WhC Wickham	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
WvC Wilkes	Slight	Slight	Severe: slope.	Slight.
WvF Wilkes	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.

* See map unit description for the composition and behavior of the map unit.

TABLE 13.--WILDLIFE HABITAT POTENTIALS

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates 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
AkB---------- Altavista	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
AmB---------- Appling	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
AmC, AmD---------- Appling	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
AnC2---------- Appling	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
CeB---------- Cecil	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CeC, CeD---------- Cecil	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CfC2, CfD2--------- Cecil	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
CuC*: Cecil----------	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Urban land.										
CuE*: Cecil----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Urban land.										
DgB---------- Davidson	Good	Good	Good	Good	Fair	Poor	Very poor.	Good	Good	Poor.
GwC2, GwD2--------- Gwinnett	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
HyB---------- Helena	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
HyC---------- Helena	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
LoD---------- Louisa	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
LoF---------- Louisa	Very poor.	Very poor.	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
MdB---------- Madison	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MdC---------- Madison	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MdE---------- Madison	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Fair	Very poor.
MfC2, MfD2--------- Madison	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 13.--WILDLIFE HABITAT POTENTIALS--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
MuC*: Madison	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Urban land.										
MuE*: Madison	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Fair	Very poor.
Urban land.										
MvC2, MwE Musella	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
PgC2 Pacolet	Poor	Poor	Poor	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
PgD2 Pacolet	Very poor.	Poor	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.
PgE2 Pacolet	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
PhE3*: Pacolet	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.
Udorthents.										
PUF* Pacolet	Very poor.	Poor	Poor	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Rh Riverview	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor.
RK*: Riverview	Good	Good	Good	Good	---	Poor	Poor	Good	Good	Poor.
Chewacla	Very poor.	Poor	Poor	Good	Good	Fair	Fair	Poor	Good	Fair.
Ro Roanoke	Poor	Poor	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
Rx*. Rock outcrop										
Ud*. Urban land										
VaB Vance	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
VaC Vance	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
WeC Wedowee	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
WEE* Wedowee	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
WhB Wickham	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 13.--WILDLIFE HABITAT POTENTIALS--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
WhC---------- Wickham	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
WvC, WvF---------- Wilkes	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.

* See map unit description for the composition and behavior of the map unit.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS

[The symbol < means less than; > means greater than. Absence of an entry means data were not estimated]

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	
AkB---------- Altavista	0-5	Fine sandy loam	ML, CL-ML, SM, SM-SC	A-4	0	95-100	95-100	65-95	35-60	<23	NP-7
	5-46	Clay loam, sandy clay loam, loam.	CL, CL-ML	A-4, A-6, A-7	0	95-100	95-100	60-95	50-75	20-45	5-26
	46-62	Variable--------	---	---	0	---	---	---	---	---	---
AmB, AmC, AmD------ Appling	0-5	Sandy loam------	SM, SM-SC	A-2	0-5	86-100	80-100	55-75	15-35	<27	NP-5
	5-34	Sandy clay, clay loam, clay.	MH, CL, ML	A-7	0-5	95-100	95-100	70-92	51-80	41-74	15-30
	34-52	Sandy clay, clay loam, sandy clay loam.	SC, CL	A-4, A-6	0-5	95-100	95-100	70-90	40-75	25-45	8-22
	52-65	Weathered bedrock.	---	---	---	---	---	---	---	---	---
AnC2---------- Appling	0-3	Sandy clay loam	CL, SC, CL-ML	A-6, A-4	0-5	95-100	90-100	70-95	40-70	20-40	6-20
	3-36	Sandy clay, clay loam, clay.	MH, CL, ML	A-7	0-5	95-100	95-100	70-92	51-80	41-74	15-30
	36-42	Sandy clay, clay loam, sandy clay loam.	SC, CL	A-4, A-6	0-5	95-100	95-100	70-90	40-75	25-45	8-22
	42-65	Weathered bedrock.	---	---	---	---	---	---	---	---	---
CeB, CeC, CeD------ Cecil	0-5	Sandy loam------	SM, SM-SC	A-2, A-4	0	84-100	80-100	67-90	26-42	<30	NP-6
	5-53	Clay------------	MH, ML	A-7	0	97-100	92-100	72-99	55-95	41-80	9-37
	53-72	Weathered bedrock.	---	---	---	---	---	---	---	---	---
CfC2, CfD2--------- Cecil	0-5	Sandy clay loam	SM, SC, CL, ML	A-4, A-6	0	74-100	72-100	68-95	38-81	21-35	3-15
	5-45	Clay------------	MH, ML	A-7	0	97-100	92-100	72-99	55-95	41-80	9-37
	45-72	Weathered bedrock.	---	---	---	---	---	---	---	---	---
CuC*, CuE*: Cecil------------	0-5	Sandy loam------	SM, SM-SC	A-2, A-4	0	84-100	80-100	67-90	26-42	<30	NP-6
	5-53	Clay------------	MH, ML	A-7	0	97-100	92-100	72-99	55-95	41-80	9-37
	53-72	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Urban land.											
DgB---------- Davidson	0-7	Loam------------	CL, CL-ML, ML	A-4, A-6	0	94-100	84-100	80-95	60-75	18-30	4-15
	7-65	Clay------------	CL, CH, ML, MH	A-7, A-6	0	96-100	95-100	85-100	65-85	35-65	15-35
GwC2, GwD2--------- Gwinnett	0-4	Sandy clay loam	SM, SC, SM-SC	A-2, A-4, A-6	0-3	95-100	85-100	65-90	30-50	<32	NP-15
	4-29	Clay, sandy clay	MH, ML, CL, CH	A-7, A-6	0-4	95-100	90-100	75-95	51-80	38-65	16-30
	29-45	Weathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
HyB, HyC---------- Helena	0-6	Sandy loam------	SM, SM-SC	A-2, A-4	0	95-100	90-100	51-86	27-46	<25	NP-7
	6-8	Sandy clay loam, clay loam.	CL	A-6, A-7	0	95-100	95-100	70-90	55-70	30-49	15-25
	8-24	Clay loam, sandy clay, clay.	CH, MH	A-7	0	95-100	95-100	73-93	56-80	50-85	24-50
	24-62	Weathered bedrock.	---	---	---	---	---	---	---	---	---
LoD, LoF---------- Louisa	0-5	Gravelly fine sandy loam.	SM	A-1, A-2, A-4	0-5	75-90	60-75	40-55	20-40	---	NP
	5-16	Gravelly loam, gravelly sandy loam.	SM	A-2, A-4	0-5	80-95	60-80	50-70	20-45	---	NP
	16-84	Weathered bedrock.	---	---	---	---	---	---	---	---	---
MdB, MdC, MdE------ Madison	0-5	Gravelly sandy loam.	SM	A-2, A-4	3-10	75-95	60-85	50-70	30-49	<35	NP-7
	5-36	Clay, clay loam	MH, ML	A-7	0-3	90-100	85-100	75-97	57-85	43-82	12-43
	36-52	Weathered bedrock.	---	---	---	---	---	---	---	---	---
MfC2, MfD2--------- Madison	0-5	Gravelly sandy clay loam.	SC, CL SM-SC	A-4, A-6	3-10	80-95	65-90	55-80	36-60	20-35	6-15
	5-36	Clay, clay loam	MH, ML	A-7	0-3	90-100	85-100	75-97	57-85	43-82	12-43
	36-52	Weathered bedrock.	---	---	---	---	---	---	---	---	---
MuC*: Madison----------	0-5	Gravelly sandy loam.	SM	A-2, A-4	3-10	75-95	60-85	50-70	30-49	<35	NP-7
	5-36	Clay, clay loam	MH, ML	A-7	0-3	90-100	85-100	75-97	57-85	43-82	12-43
	36-52	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Urban land.											
MuE*: Madison----------	0-5	Gravelly sandy clay loam.	SC, CL SM-SC	A-4, A-6	3-10	80-95	65-90	55-80	36-60	20-35	6-15
	5-36	Clay, clay loam	MH, ML	A-7	0-3	90-100	85-100	75-97	57-85	43-82	12-43
	36-52	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Urban land.											
MvC2---------- Musella	0-5	Clay loam-------	SM, SC, SM-SC, ML	A-4	0-5	95-100	80-95	60-80	40-65	<37	NP-10
	5-18	Gravelly clay loam, gravelly clay, clay loam.	ML, CL, SM, SC	A-6, A-7	10-20	75-90	60-85	55-80	43-64	34-48	11-20
	18-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---
MwE---------- Musella	0-5	Stony clay loam	SM, SC, SM-SC	A-2, A-4	5-20	75-90	60-90	50-70	30-45	<37	NP-10
	5-18	Gravelly clay loam, gravelly clay.	ML, CL, SM, SC	A-6, A-7	10-20	75-90	60-85	55-80	43-64	34-48	11-20
	18-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---
PgC2, PgD2, PgE2--- Pacolet	0-5	Sandy clay loam	SM-SC, SC	A-4, A-6	0-1	95-100	90-100	65-85	36-50	20-40	4-17
	5-28	Sandy clay, clay loam, clay.	ML, MH	A-6, A-7	0	80-100	80-100	60-95	51-75	38-60	11-27
	28-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
PhE3*:											
Pacolet	0-5	Sandy clay loam-	SM-SC, SC	A-4, A-6	0-1	95-100	90-100	65-85	36-50	20-40	4-17
	5-28	Sandy clay, clay loam, clay.	ML, MH	A-6, A-7	0	80-100	80-100	60-95	51-75	38-60	11-27
	28-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Udorthents.											
PUF*-----------	0-6	Sandy loam------	SM	A-2	0-2	85-100	80-100	60-80	20-35	<30	NP-6
Pacolet	6-33	Sandy clay, clay loam, clay.	ML, MH	A-6, A-7	0	80-100	80-100	60-95	51-75	38-60	11-27
	33-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Rh-----------	0-34	Loam------------	CL, CL-ML	A-4	0	100	100	90-100	60-80	15-30	5-10
Riverview	34-65	Loamy fine sand, sandy loam, silty clay loam.	SM, SC, ML, CL	A-2, A-4, A-6	0	100	100	80-95	20-80	<40	NP-20
RK*:											
Riverview---------	0-34	Loam------------	CL, CL-ML	A-4	0	100	100	90-100	60-80	15-30	5-10
	34-65	Loamy fine sand, sandy loam, silty clay loam.	SM, SC, ML, CL	A-2, A-4, A-6	0	100	100	80-95	20-80	<40	NP-20
Chewacla----------	0-8	Loam------------	ML	A-4, A-5, A-6, A-7	0	98-100	95-100	70-100	55-90	36-50	4-18
	8-34	Sandy clay loam, loam, sandy loam.	SM, CL-ML, SM-SC, ML	A-4	0	96-100	95-100	60-80	36-70	<35	NP-7
	34-65	Silt loam, clay loam, silty clay loam.	ML, MH	A-4, A-5, A-6, A-7	0	96-100	95-100	80-100	51-98	32-61	4-30
Ro-----------	0-14	Silty clay loam	CL, MH, CH, CL-ML	A-7	0	95-100	85-100	80-100	80-95	41-55	14-28
Roanoke	14-65	Clay, silty clay, clay loam.	CH, MH, CL	A-7	0	90-100	85-100	85-100	65-95	45-60	22-36
Rx*.											
Rock outcrop											
Ud*.											
Urban land											
VaB, VaC----------	0-8	Sandy loam------	SM, SM-SC	A-2, A-4	0-5	90-100	80-100	55-80	15-40	<27	NP-5
Vance	8-48	Clay loam, sandy clay, clay.	CH, MH	A-7	0-5	95-100	90-100	75-95	65-80	51-80	25-48
	48-70	Weathered bedrock.	---	---	---	---	---	---	---	---	---
WeC, WEE*---------	0-7	Sandy loam------	SM, SM-SC	A-4, A-2	0	95-100	90-100	60-85	30-50	<30	NP-6
Wedowee	7-10	Loam, sandy clay loam.	SM, SC, CL, ML	A-4, A-6	0	90-100	90-100	80-97	40-75	<32	NP-15
	10-34	Sandy clay, clay loam, clay.	SC, ML, CL, SM	A-4, A-6, A-7	0	95-100	95-100	65-97	45-70	30-58	10-25
	34-42	Variable--------	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 14.--ENGINEERING PROPERTIES AND CLASSIFICATIONS--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	
WhB, WhC---------- Wickham	0-8	Fine sandy loam	SM, SM-SC, ML, CL-ML	A-4	0	95-100	90-100	70-100	45-80	<25	NP-7
	8-50	Sandy clay loam, clay loam, loam.	CL-ML, CL, SC, SM-SC	A-2, A-4, A-6, A-7-6	0	95-100	90-100	75-100	30-70	20-41	5-15
	50-72	Variable--------	---	---	---	---	---	---	---	---	---
WvC, WvF---------- Wilkes	0-5	Gravelly sandy loam.	SM, SM-SC	A-2, A-4, A-1-B	10-25	70-80	60-75	45-75	20-49	<20	NP-7
	5-16	Clay loam, clay, sandy clay loam.	CL, CH, MH, ML	A-6, A-7	0-10	80-100	80-100	75-95	50-80	30-60	11-32
	16-40	Weathered bedrock.	---	---	---	---	---	---	---	---	---

* See map unit description for the composition and behavior of the map unit.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[The symbol > means greater than. The erosion tolerance factor (T) is for the entire profile. Absence of an entry means data were not available or were not estimated.]

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Risk of corrosion		Erosion factors	
						Uncoated steel	Concrete	K	T
	In	In/hr	In/in	pH					
AkB----------	0-5	2.0-6.0	0.12-0.20	4.5-6.0	Low----------	Moderate	Moderate	0.20	4
Altavista	5-46	0.6-2.0	0.12-0.20	4.5-6.0	Low----------	Moderate	Moderate	0.24	
	46-62	---	---	---	----------	----------	----------	---	
AmB, AmC, AmD------	0-5	2.0-6.0	0.10-0.15	4.5-5.5	Low----------	Moderate	Moderate	0.24	4
Appling	5-34	0.6-2.0	0.15-0.17	4.5-5.5	Moderate-----	Moderate	Moderate	0.20	
	34-52	0.6-2.0	0.12-0.16	4.5-5.5	Low----------	Moderate	Moderate	0.24	
	52-65	---	---	---	----------	----------	----------	---	
AnC2----------	0-3	0.6-2.0	0.12-0.15	4.5-5.5	Low----------	Moderate	Moderate	0.20	3
Appling	3-36	0.6-2.0	0.15-0.17	4.5-5.5	Moderate-----	Moderate	Moderate	0.20	
	36-42	0.6-2.0	0.12-0.16	4.5-5.5	Low----------	Moderate	Moderate	0.24	
	42-65	---	---	---	----------	----------	----------	---	
CeB, CeC, CeD------	0-5	2.0-6.0	0.12-0.14	4.5-6.0	Low----------	Moderate	Moderate	0.28	3
Cecil	5-53	0.6-2.0	0.13-0.15	4.5-5.5	Moderate-----	Moderate	Moderate	0.28	
	53-72	---	---	---	----------	----------	----------	---	
CfC2, CfD2---------	0-5	0.6-2.0	0.13-0.15	4.5-6.0	Low----------	Moderate	Moderate	0.28	3
Cecil	5-45	0.6-2.0	0.13-0.15	4.5-5.5	Moderate-----	Moderate	Moderate	0.28	
	45-72	---	---	---	----------	----------	----------	---	
CuC*, CuE*:									
Cecil----------	0-5	2.0-6.0	0.12-0.14	4.5-6.0	Low----------	Moderate	Moderate	0.28	3
	5-53	0.6-2.0	0.13-0.15	4.5-5.5	Moderate-----	Moderate	Moderate	0.28	
	53-72	---	---	---	----------	----------	----------	---	
Urban land.									
DgB----------	0-7	0.6-2.0	0.14-0.18	4.5-6.5	Low----------	High------	Moderate	0.28	5
Davidson	7-65	0.6-2.0	0.12-0.16	4.5-6.0	Low----------	High------	Moderate	0.24	
GwC2, GwD2---------	0-4	0.6-2.0	0.11-0.17	5.1-6.5	Low----------	High------	Moderate	0.28	4
Gwinnett	4-29	0.6-2.0	0.11-0.16	5.1-6.5	Moderate-----	High------	Moderate	0.28	
	29-45	---	---	---	----------	----------	----------	---	
HyB, HyC----------	0-6	2.0-6.0	0.10-0.12	4.5-6.0	Low----------	High------	Moderate	0.37	3
Helena	6-8	0.2-0.6	0.13-0.15	4.5-5.5	Moderate-----	High------	High------	0.37	
	8-24	0.06-0.2	0.13-0.15	4.5-5.5	High---------	High------	High------	0.32	
	24-62	---	---	---	----------	----------	----------	---	
LoD, LoF----------	0-5	2.0-6.0	0.10-0.14	4.5-6.0	Low----------	Low-------	Moderate	0.24	2
Louisa	5-16	2.0-6.0	0.10-0.15	4.5-6.0	Low----------	Low-------	Moderate	0.24	
	16-84	---	---	---	----------	----------	----------	---	
MdB, MdC, MdE------	0-5	>6.0	0.08-0.13	4.5-6.0	Low----------	High------	Moderate	0.28	4
Madison	5-36	0.6-2.0	0.13-0.18	4.5-5.5	Low----------	High------	Moderate	0.32	
	36-52	---	---	---	----------	----------	----------	---	
MfC2, MfD2---------	0-5	0.6-2.0	0.12-0.16	4.5-6.0	Moderate-----	High------	Moderate	0.28	3
Madison	5-36	0.6-2.0	0.13-0.18	4.5-5.5	Low----------	High------	Moderate	0.32	
	36-52	---	---	---	----------	----------	----------	---	
MuC*:									
Madison----------	0-5	>6.0	0.08-0.13	4.5-6.0	Low----------	High------	Moderate	0.28	4
	5-36	0.6-2.0	0.13-0.18	4.5-5.5	Low----------	High------	Moderate	0.32	
	36-52	---	---	---	----------	----------	----------	---	
Urban land.									

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Risk of corrosion		Erosion factors	
						Uncoated steel	Concrete	K	T
	In	In/hr	In/in	pH					
MuE*:									
Madison	0-5	2.0-6.0	0.11-0.15	4.5-6.0	Low	High	Moderate	0.32	4
	5-36	0.6-2.0	0.13-0.18	4.5-5.5	Low	High	Moderate	0.32	
	36-52	---	---	---				---	
Urban land.									
MvC2	0-5	0.6-2.0	0.17-0.19	5.1-6.5	Very low	Moderate	Moderate	0.32	2
Musella	5-18	0.6-2.0	0.10-0.13	5.1-6.5	Low	Moderate	Moderate	0.32	
	18-60	---	---	---				---	
MwE	0-5	0.6-2.0	0.12-0.14	5.6-6.5	Very low	Moderate	Moderate	0.28	2
Musella	5-18	0.6-2.0	0.10-0.13	5.6-6.5	Low	Moderate	Moderate	0.32	
	18-60	---	---	---				---	
PgC2, PgD2, PgE2	0-5	0.6-2.0	0.10-0.14	4.5-6.0	Low	Moderate	High	0.24	2
Pacolet	5-28	0.6-2.0	0.12-0.15	4.5-6.0	Low	High	High	0.28	
	28-60	---	---	---				---	
PhE3*:									
Pacolet	0-5	0.6-2.0	0.10-0.14	4.5-6.0	Low	Moderate	High	0.24	2
	5-28	0.6-2.0	0.12-0.15	4.5-6.0	Low	High	High	0.28	
	28-60	---	---	---				---	
Udorthents.									
PUF*	0-6	2.0-6.0	0.08-0.12	4.5-6.0	Low	Moderate	High	0.20	3
Pacolet	6-33	0.6-2.0	0.12-0.15	4.5-6.0	Low	High	High	0.28	
	33-60	---	---	---				---	
Rh	0-34	0.6-2.0	0.16-0.24	4.5-5.5	Low	Low	Moderate	0.28	4
Riverview	34-65	2.0-6.0	0.07-0.11	4.5-5.5	Very low	Low	Moderate	0.17	
RK*:									
Riverview	0-34	0.6-2.0	0.16-0.24	4.5-5.5	Low	Low	Moderate	0.28	4
	34-65	2.0-6.0	0.07-0.11	4.5-5.5	Very low	Low	Moderate	0.17	
Chewacla	0-8	0.6-2.0	0.15-0.24	4.5-6.5	Low	High	Moderate	0.28	4
	8-34	0.6-2.0	0.12-0.20	4.5-6.5	Low	High	Moderate	0.28	
	34-65	0.6-2.0	0.15-0.24	4.5-6.5	Low	High	Moderate	0.32	
Ro	0-14	0.2-0.6	0.16-0.19	4.5-5.5	Moderate	High	High	---	---
Roanoke	14-65	0.06-0.2	0.10-0.19	4.5-5.5	Moderate	High	High	---	
Rx*.									
Rock outcrop									
Ud*.									
Urban land									
VaB, VaC	0-8	2.0-6.0	0.10-0.14	4.5-6.0	Low	High	Moderate	0.28	3
Vance	8-48	0.06-0.2	0.12-0.15	4.5-5.5	Moderate	High	High	0.37	
	48-70	---	---	---				---	
WeC, WEE*	0-7	2.0-6.0	0.10-0.18	4.5-5.5	Low	Low	High	0.24	2
Wedowee	7-10	0.6-2.0	0.12-0.18	4.5-5.5	Low	Moderate	High	0.28	
	10-34	0.2-0.6	0.12-0.18	4.5-5.5	Moderate	Moderate	High	0.28	
	34-42	---	---	---				---	
WhB, WhC	0-8	2.0-6.0	0.11-0.16	4.5-6.0	Low	Moderate	High	0.20	5
Wickham	8-50	0.6-2.0	0.12-0.17	4.5-6.0	Low	Moderate	High	0.24	
	50-72	---	---	---				---	
WvC, WvF	0-5	2.0-6.0	0.10-0.14	5.1-6.5	Low	Moderate	Moderate	0.24	2
Wilkes	5-16	0.2-0.6	0.15-0.20	6.1-7.8	Moderate	Moderate	Moderate	0.32	
	16-40	---	---	---				---	

* See map unit description for the composition and behavior of the map unit.

TABLE 16.--SOIL AND WATER FEATURES

[Absence of an entry indicates the feature is not a concern. The definitions of "flooding" and "water table" in the glossary explain such terms as "rare," "brief," and "perched." The symbol > means greater than]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness
					Ft			In	
AkB---------- Altavista	C	None to occasional.	Very brief	Mar-Jul	1.5-2.5	Apparent	Dec-Mar	>60	---
AmB, AmC, AmD, AnC2---------- Appling	B	None--------	---	---	>6.0	---	---	>60	---
CeB, CeC, CeD, CfC2, CfD2------- Cecil	B	None--------	---	---	>6.0	---	---	>60	---
CuC*, CuE*: Cecil----------	B	None--------	---	---	>6.0	---	---	>60	---
Urban land.									
DgB---------- Davidson	B	None--------	---	---	>6.0	---	---	>60	---
GwC2, GwD2-------- Gwinnett	B	None--------	---	---	>6.0	---	---	20-40	Rippable
HyB, HyC---------- Helena	C	None--------	---	---	1.0-2.5	Perched	Jan-Mar	>48	Rippable
LoD, LoF---------- Louisa	B	None--------	---	---	>6.0	---	---	>60	---
MdB, MdC, MdE, MfC2, MfD2------- Madison	B	None--------	---	---	>6.0	---	---	>60	---
MuC*, MuE*: Madison----------	B	None--------	---	---	>6.0	---	---	>60	---
Urban land.									
MvC2, MwE--------- Musella	B	None--------	---	---	>6.0	---	---	14-20	Rippable
PgC2, PgD2, PgE2-- Pacolet	B	None--------	---	---	>6.0	---	---	>60	---
PhE3*: Pacolet----------	B	None--------	---	---	>6.0	---	---	>60	---
Udorthents.									
PUF*---------- Pacolet	B	None--------	---	---	>6.0	---	---	>60	---
Rh---------- Riverview	B	Common------	Brief-----	Dec-Mar	3.0-5.0	Apparent	Dec-Mar	>60	---
RK*: Riverview--------	B	Common------	Brief-----	Dec-Mar	3.0-5.0	Apparent	Dec-Mar	>60	---
Chewacla---------	C	Common------	Brief-----	Nov-Apr	0.5-1.5	Apparent	Nov-Apr	>60	---
Ro---------- Roanoke	D	Frequent----	Brief-----	Nov-Jun	0-1.0	Apparent	Nov-May	>60	---

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	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness
					Ft			In	
Rx*. Rock outcrop									
Ud*. Urban land									
VaB, VaC---------- Vance	C	None--------	---	---	>6.0	---	---	>60	---
WeC, WEE*--------- Wedowee	B	None--------	---	---	>6.0	---	---	>60	---
WhB, WhC---------- Wickham	B	None to rare	---	---	>6.0	---	---	>60	---
WvC, WvF---------- Wilkes	C	None--------	---	---	>6.0	---	---	40-80	Hard

* See map unit description for the composition and behavior of the map unit.

TABLE 17.--ENGINEERING TEST DATA

Soil name and location	Report number	Depth	Moisture density		Volume change in percent			Mechanical analysis										Liquid limit	Plasticity index	Classification	
								Percentage passing sieve						Percentage smaller than							
			Maximum dry density	Optimum moisture	Shrinkage	Swell	Total volume change	3/4 in.	3/8 in.	No. 4	No. 10	No. 40	No. 200	0.05 mm	0.02 mm	0.005 mm	0.002 mm			AASHTO	Unified
		In	Pct	Pct																	
Cecil sandy loam:																					
S70-Ga-141-	1-1	0-5	116	12	0.8	5.4	6.2	100	100	99	98	79	27	23	20	14	9	SIC	NP	A-2-4(0)	SM
8.0 miles south of La	1-2	5-26	89	29	10.2	5.0	15.2	100	100	100	100	95	75	73	69	60	53	59	22	A-7-6(19)	MH
Grange along Floyd road, 300 feet east of intersection of Floyd road and Salem road; Troup County.	1-5	53-72+	101	20	2.9	9.0	11.9	100	100	100	99	83	54	49	43	32	24	SIC	NP	A-4(0)	ML
Cecil sandy loam:																					
S70-Ga-38-	3-1	0-5	115	15	1.7	6.1	7.8	100	100	100	100	72	43	39	35	22	12	SIC	NP	A-4(0)	SM
From the intersection of	3-2	5-29	89	28	7.5	6.9	14.4	100	100	100	100	88	72	70	67	55	45	58	20	A-7-5(17)	MH
Poplar road and Freeman road, 0.5 mile north on Freeman road; Coweta County.	3-5	60-84+	92	25	2.7	30.2	32.9	100	100	100	100	80	51	49	35	18	12	SIC	NP	A-4(0)	ML
Pacolet sandy loam:																					
S70-Ga-141-	2-1	0-4	124	10	0.2	3.6	3.8	99	96	94	92	71	24	19	18	10	7	SIC	NP	A-2-4(0)	SM
From the intersection of	2-2	4-28	88	29	3.9	2.0	5.9	100	100	100	100	93	74	71	69	58	51	50	15	A-7-5(12)	MH
Oak Grove road and Floyd road, 1.6 miles south on Floyd road; Troup County.	2-4	36-60	103	19	4.1	6.4	10.5	100	100	100	100	79	43	42	37	25	22	SIC	NP	A-4(0)	SM
Wedowee sandy loam:																					
S70-Ga-74-	3-3	0-4	118	12	0.7	3.8	4.5	100	100	100	99	71	28	25	18	10	6	SIC	NP	A-2-4(0)	SM
4.0 miles southwest of	3-6	10-29	100	25	9.6	3.0	12.6	100	100	100	100	85	63	61	57	54	52	47	17	A-7-5(10)	ML
Franklin, south of Georgia Highway 34, 1.0 mile northeast of Flat Rock Campground; Heard County.	3-8	34-42+	100	19	1.2	3.4	4.6	100	100	100	100	55	25	23	19	15	13	SIC	NP	A-2-4(0)	SM

TABLE 18.--CLASSIFICATION OF THE SOILS

[An asterisk in the first column indicates a taxadjunct to the series. See text for a description of those characteristics of this taxadjunct that are outside the range of the series]

Soil name	Family or higher taxonomic class
Altavista	Fine-loamy, mixed, thermic Aquic Hapludults
Appling	Clayey, kaolinitic, thermic Typic Hapludults
Cecil	Clayey, kaolinitic, thermic Typic Hapludults
Chewacla	Fine-loamy, mixed, thermic Fluvaquentic Dystrochrepts
Davidson	Clayey, kaolinitic, thermic Rhodic Paleudults
Gwinnett	Clayey, kaolinitic, thermic Typic Rhodudults
Helena	Clayey, mixed, thermic Aquic Hapludults
Louisa	Loamy, micaceous, thermic, shallow Ruptic-Ultic Dystrochrepts
Madison	Clayey, kaolinitic, thermic Typic Hapludults
Musella	Loamy, mixed, thermic, shallow Typic Rhodudults
Pacolet	Clayey, kaolinitic, thermic Typic Hapludults
Riverview	Fine-loamy, mixed, thermic Fluventic Dystrochrepts
*Roanoke	Clayey, mixed, thermic Typic Ochraquults
*Vance	Clayey, mixed, thermic Typic Hapludults
Wedowee	Clayey, kaolinitic, thermic Typic Hapludults
Wickham	Fine-loamy, mixed, thermic Typic Hapludults
Wilkes	Loamy, mixed, thermic, shallow Typic Hapludalfs

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