United States Department of Agriculture

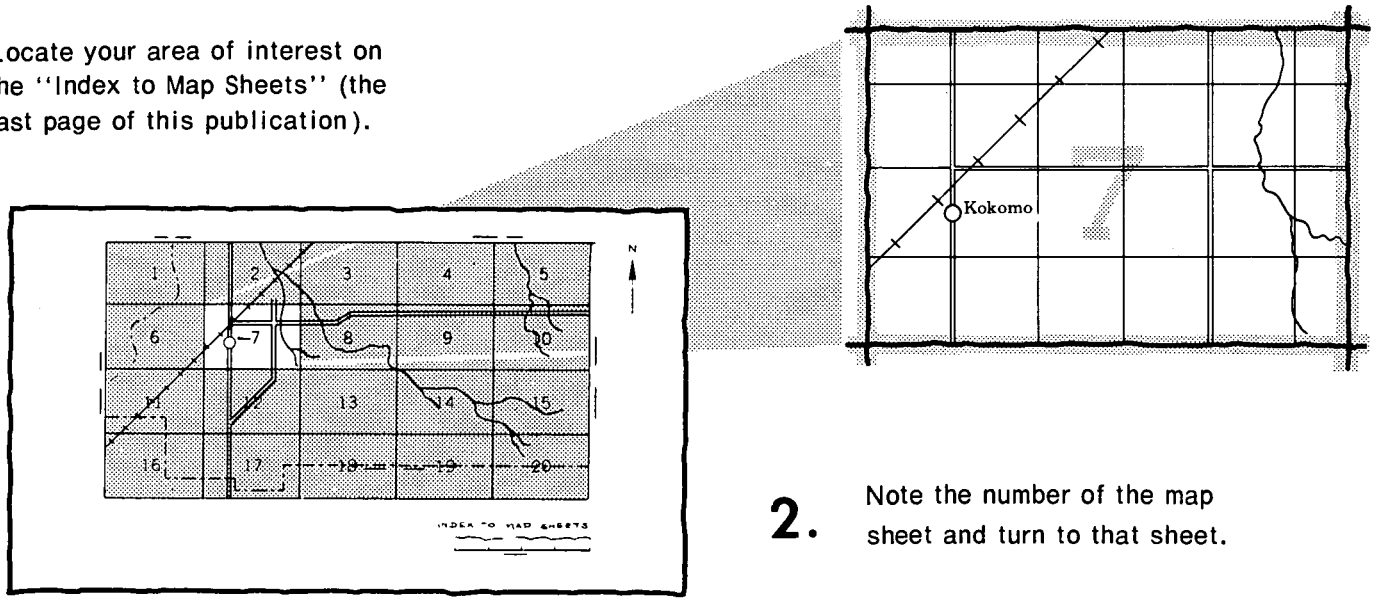
Soil Conservation Service

In cooperation with
North Carolina Department of Natural Resources and Community Development,
North Carolina Agricultural Research Service,
North Carolina Agricultural Extension Service, and
Hertford County Board of Commissioners

Soil Survey of Hertford County North Carolina

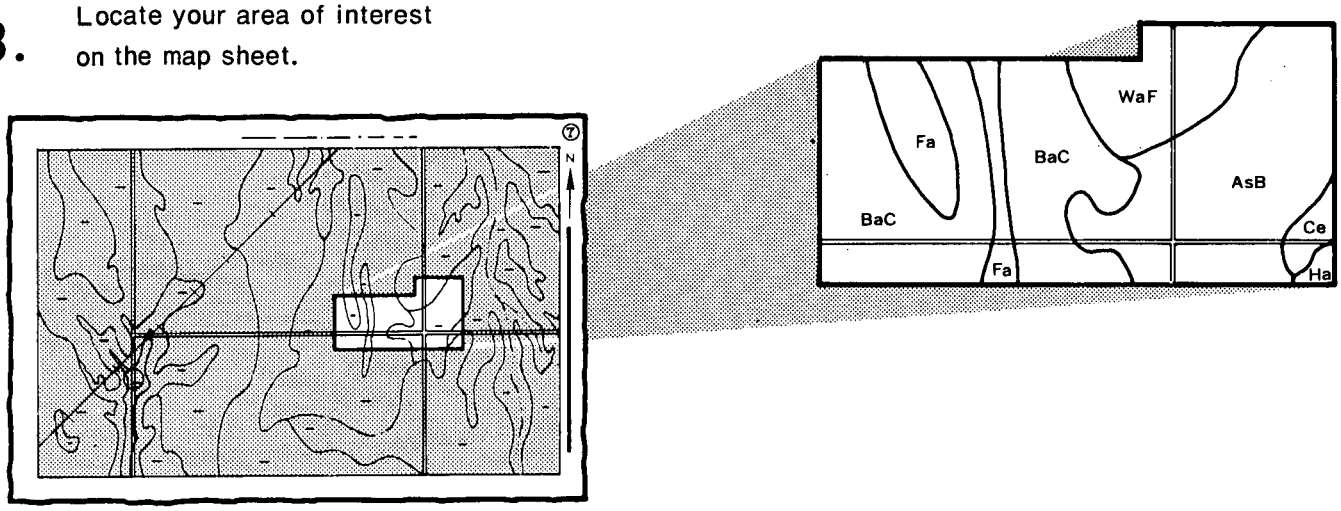
HOW TO USE

1. Locate your area of interest on the "Index to Map Sheets" (the last page of this publication).

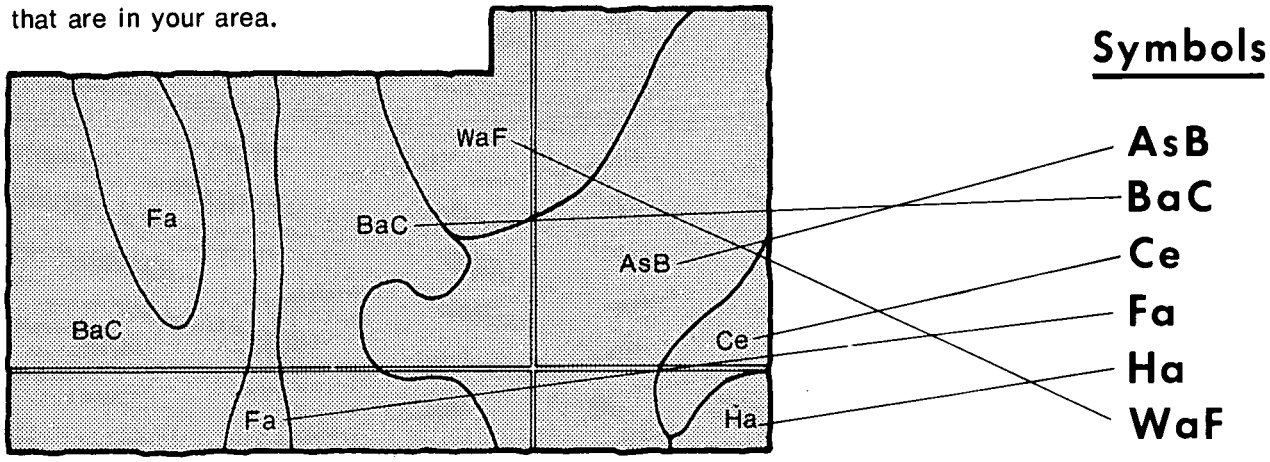


2. Note the number of the map sheet and turn to that sheet.

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

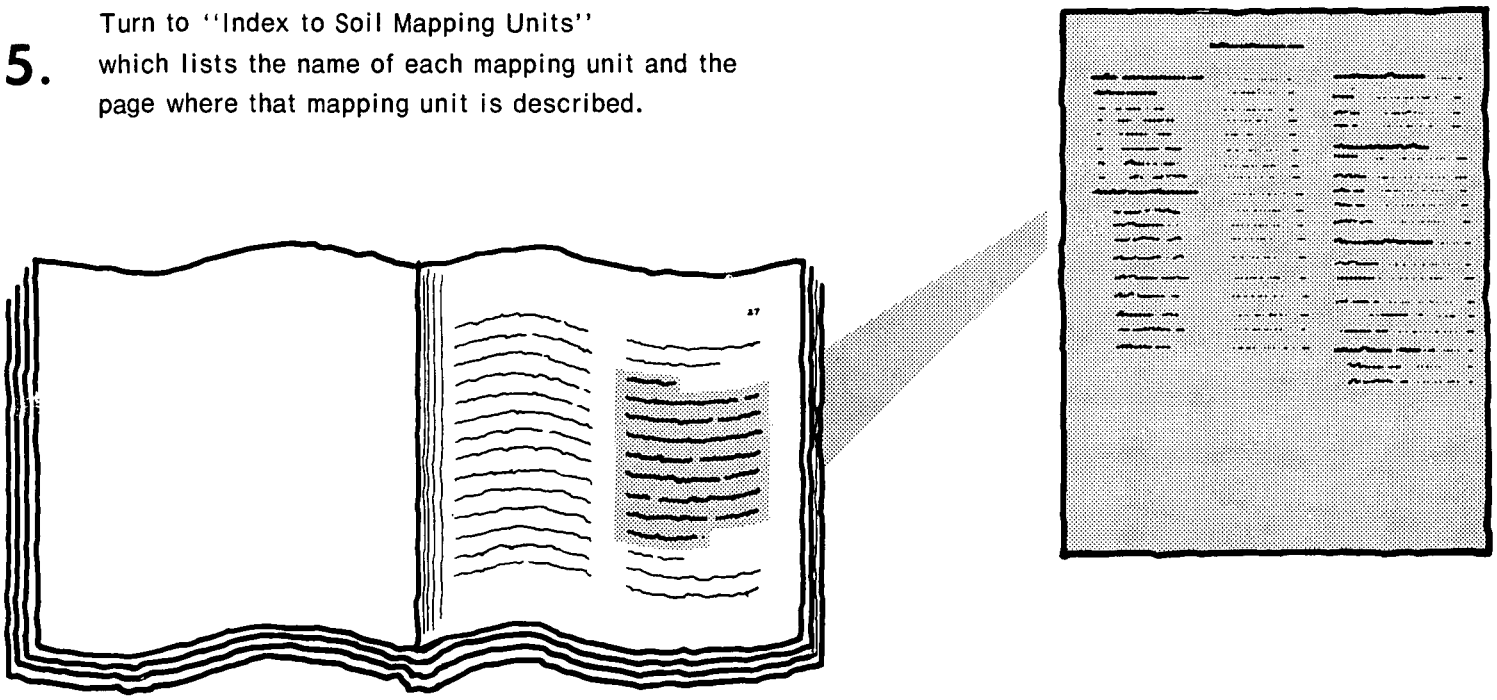


4. List the mapping unit symbols that are in your area.

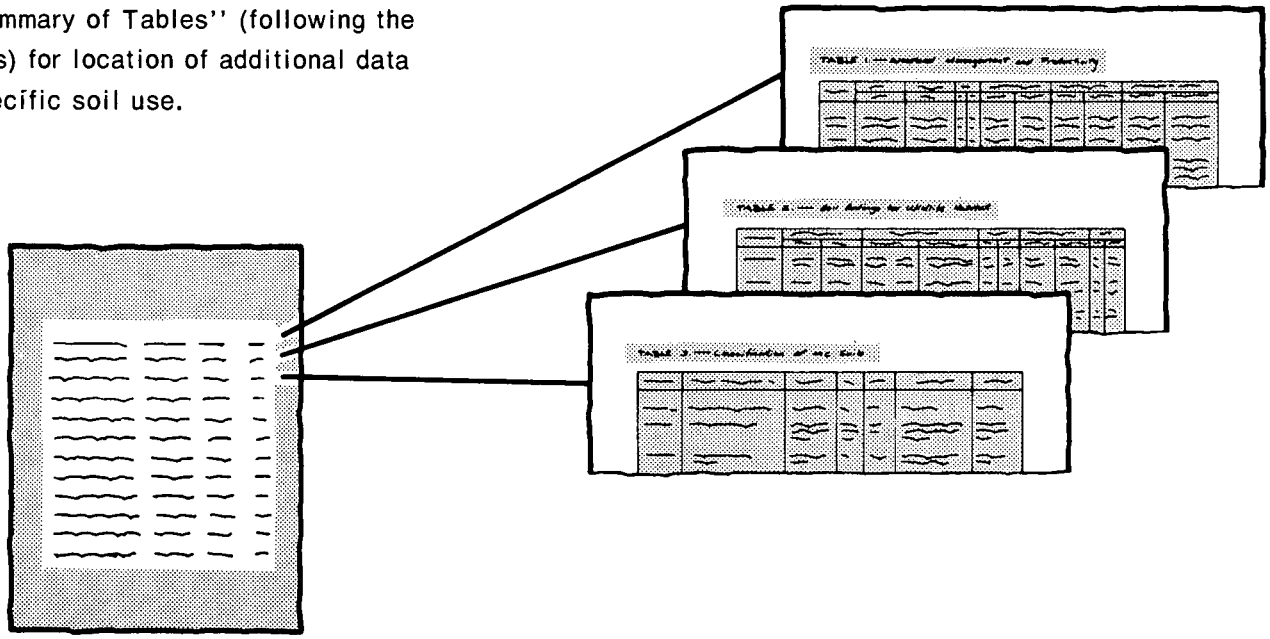


THIS SOIL SURVEY

5. Turn to "Index to Soil Mapping Units" which lists the name of each mapping unit and the page where that mapping 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 soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was completed in 1980. Soil names and descriptions were approved in 1980. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1980. This survey was made cooperatively by the Soil Conservation Service, the North Carolina Department of Natural Resources and Community Development, North Carolina Agricultural Research Service, North Carolina Agricultural Extension Service, and the Hertford County Board of Commissioners. It is part of the technical assistance furnished to the Hertford County Soil and Water Conservation District.

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

This soil survey supersedes a survey of Hertford County published in 1917.

Cover: Peanuts on Carolina fine sandy loam, 0 to 2 percent slopes.

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Soil Series

Issued July 1984

Index to Map Units

Summary of Tables

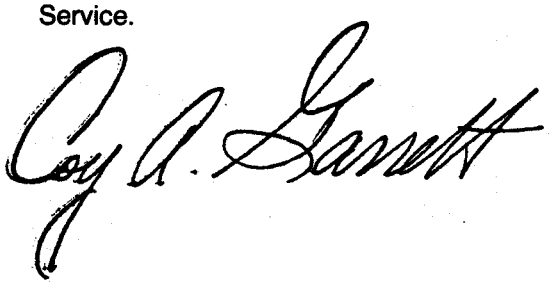
Foreword

This soil survey contains information that can be used in land-planning programs in Hertford County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

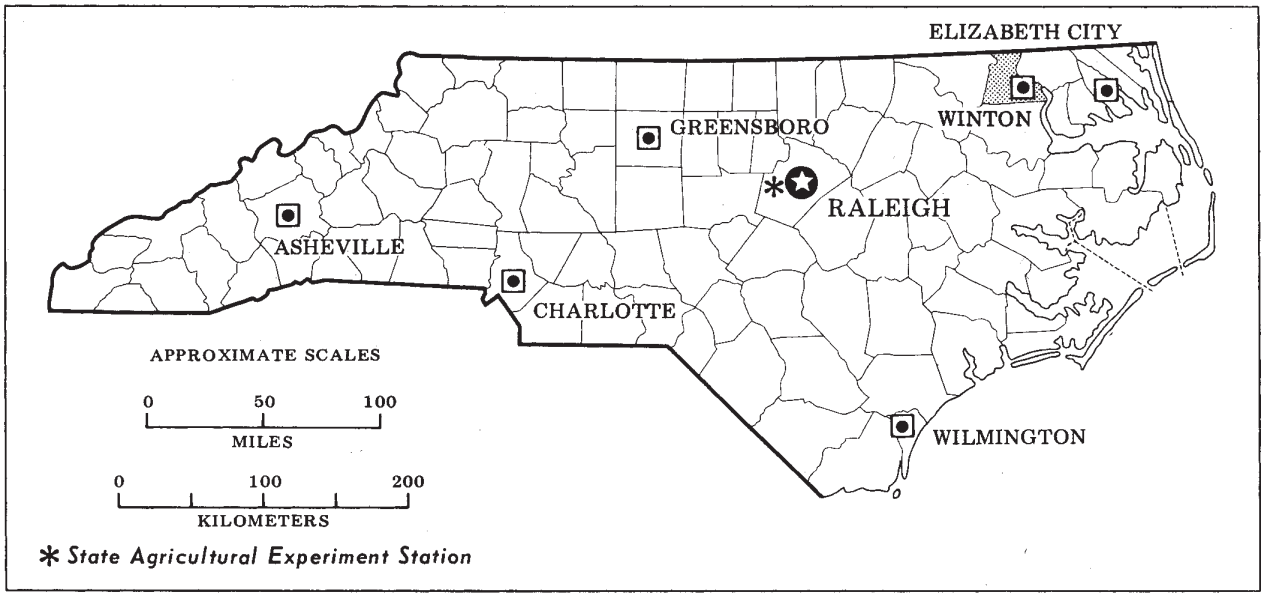
This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey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

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

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the North Carolina Agricultural Extension Service.



Coy A. Garrett
State Conservationist
Soil Conservation Service



Location of Hertford County in North Carolina.

Soil Survey of
Hertford County, North Carolina

By Robert M. Kirby

Soils surveyed by Robert M. Kirby and Michael Kimbro,
Soil Conservation Service,
Eugene Mellette, Hertford County,
and Karl A. Shaffer, North Carolina Department of
Natural Resources and Community Development

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General Nature of the County

Hertford County is in the northeastern part of North Carolina. It is bounded on the north by the Virginia State Line; on the east by Gates and Chowan Counties, from which it is separated by the Chowan River; on the south by Bertie County; and on the west by Northampton County. The area of the county is 356 square miles, or 227,840 acres.

Hertford County was organized in 1759. Its present boundaries were established in 1779. Winton, situated on the Chowan River, was established as the county seat in 1788. The Court House contains records of land transfers dating from 1714. The early settlers were principally European immigrants, although some of them moved into the area from adjoining colonies. North American Indians were well represented in the colonial population.

According to the 1980 Census, the population of the county was 22,246. The towns of Ahoskie and Murfreesboro are major trading and education centers. A major federal and state road system connects the county with Norfolk, Virginia; Raleigh, the state capital; and points south. The Seaboard Coastline Railroad provides access to Norfolk.

Farming is a major enterprise. Corn, soybeans, tobacco, and cotton are the main crops. Lumber and timber products are important to the economy of the county.

Physiography, Relief, and Drainage

The elevation of the county ranges from about 10 feet above sea level on the broad bottom lands along the major streams to about 75 feet in the western part of the county.

Water is plentiful throughout the county. The major towns have municipal water supplies drawn from deep wells. Well water is available at a depth ranging from 10 to 60 feet, and artesian water is available in parts of the county at a depth of 90 to 150 feet.

The county is drained by the Meherrin and Wiccacon Rivers, tributaries of the Chowan River. Major creeks and swamps in this drainage system are the Ahoskie, Bear, Cutawhiskie, Chinkapin, Deep Swamp Branch, and Potecasi.

Climate

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

Hertford County is hot and generally humid in summer because of moist maritime air. Winter is moderately cold; however, it is short because the mountains to the west protect the area from many of the cold waves. Precipitation is evenly distributed throughout the year and is adequate for all crops .

Table 1 gives data on temperature and precipitation for the survey area as recorded at Jackson in the period 1951 to 1978. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 42 degrees F, and the average daily minimum temperature is 31 degrees. The lowest temperature on record, which occurred at Jackson on December 16, 1958, is 1 degree. In summer the average temperature is 77 degrees, and the average daily maximum temperature is 88 degrees. The highest recorded temperature, which occurred on July 31, 1953, is 105 degrees.

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

The total annual precipitation is about 45 inches. Of this, 25 inches, or 55 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 23 inches. The heaviest 1-day rainfall during the period of record was 5.8 inches at Jackson on August 12,1955. Thunderstorms occur on about 40 days each year, and most occur in summer.

The average seasonal snowfall is 6 inches. The greatest snow depth at any one time during the period of record was 16 inches. On an average of 3 days, at least 1 inch of snow is on the ground. The number of such days varies greatly from year to year.

Every few years heavy snow covers the ground for a few days to a week. Every few years, in late summer or autumn, a tropical storm moving inland from the Atlantic Ocean causes extremely heavy rain for 1 to 3 days.

The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 80 percent. The sun shines 65 percent of the time possible in summer and 55 percent in winter. The prevailing wind is from the southwest. Average windspeed is highest, 11 miles per hour, in spring.

How This Survey Was Made

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

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

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

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

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

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

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

Map Unit Composition

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

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

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

General Soil Map Units

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

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

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

Soil Descriptions

1. Norfolk-Bonneau-Goldsboro

Nearly level to sloping, well drained and moderately well drained soils that have a sandy or loamy surface layer and a loamy subsoil; on uplands

The major soils in this unit are on broad ridges and side slopes adjacent to terraces and flood plains. These soils are in three widely separated areas. The largest area is in the western midsection south of the Meherrin River, near Murfreesboro. The second area is in the southeastern part of the county, near Harrelsville, and the third area is in the extreme north-central part, adjacent to the Virginia line.

This map unit makes up 20 percent of the county. It is 41 percent Norfolk soils, 20 percent Bonneau soils, and 12 percent Goldsboro soils. Soils of minor extent, including Craven, Dorovan, Rains, Lynchburg, and Wilbanks soils, make up 27 percent.

The Norfolk soils are nearly level to sloping. They are well drained. Their surface layer is dark grayish brown loamy fine sand. The subsurface layer is light yellowish brown loamy fine sand. The subsoil is yellowish brown sandy clay loam in the upper part and light gray sandy clay loam in the lower part.

The Bonneau soils are nearly level to sloping. They are well drained or moderately well drained. Their surface layer is grayish brown loamy sand. The subsurface layer is yellowish brown loamy sand. The subsoil is yellowish brown and brownish yellow sandy clay loam.

The Goldsboro soils are nearly level. They are well drained. Their surface layer is dark grayish brown fine sandy loam. The subsurface layer is light yellowish brown sandy loam. The subsoil is yellowish brown and brownish yellow sandy clay loam in the upper part and mottled gray, brown, and red sandy clay loam in the lower part.

The major soils in this map unit are used mainly as cropland. In a few areas they are used as pasture and woodland. The Norfolk and Goldsboro soils are well suited to use as cropland, pasture, and woodland. The Bonneau soils are suited to these uses.

The soils in this unit are suited to most urban uses. Wetness and a sandy surface layer are the main limitations. The Norfolk soils are well suited to recreational uses. The Bonneau and Goldsboro soils are suited to these uses. Wetness is the main limitation.

2. Craven-Leaf-Caroline

Nearly level and gently sloping, moderately well drained, poorly drained, and well drained soils that have a loamy surface layer and a clayey or loamy subsoil; on uplands

The major soils in this map unit are on broad ridges and flats and in depressions in the southwestern part of the county. They are divided by narrow flood plains and flat interstream areas of clayey soils.

This map unit makes up 22 percent of the county. It is 63 percent Craven soils, 18 percent Leaf soils, 11 percent Caroline soils, and 8 percent soils of minor extent. The minor soils include Exum, Lenoir, and Winton soils.

The Craven soils are nearly level and gently sloping. They are moderately well drained. Their surface layer is light yellowish brown fine sandy loam. The subsoil is brownish yellow silty clay or clay in the upper part and light gray and brownish yellow clay in the lower part. The underlying material is light gray and brownish yellow clay.

The Leaf soils are nearly level. They are poorly drained. Their surface layer is dark grayish brown loam. The subsoil is grayish brown and gray clay in the upper part and gray clay in the lower part. The underlying material is gray clay.

The Caroline soils are nearly level and gently sloping. They are well drained. Their surface layer is yellowish brown fine sandy loam. The subsurface layer is yellowish brown clay loam. The subsoil is yellowish brown clay loam in the upper part and strong brown and yellowish red clay loam in the lower part.

The Caroline and Craven soils are used mainly as cropland. The Leaf soils are used mainly as woodland and pasture. The Caroline soils are well suited to use as cropland, pasture, and woodland, and the Craven soils are suited to these uses. The Leaf soils are suited to use as pasture and woodland; they are poorly suited to use as cropland. Wetness is the main limitation.

The Caroline soils are suited to most urban and recreation uses. Slow permeability is the main limitation. The Craven and Leaf soils are poorly suited to these uses because of wetness and slow permeability.

3. Leaf-Lenoir-Craven

Nearly level, poorly drained, somewhat poorly drained, and moderately well drained soils that have a loamy surface layer and a clayey subsoil; on uplands

The major soils in this map unit are on large flats and in broad depressions. There are a few gently sloping areas. Most areas of this map unit are in the central and eastern parts of the county; some small areas are in the southwestern and extreme northwestern parts.

This map unit makes up 35 percent of the county. It is 43 percent Leaf soils, 22 percent Lenoir soils, 22 percent Craven soils, and 13 percent soils of minor extent. The minor soils include Goldsboro, Norfolk, and Winton soils.

The Leaf soils are poorly drained. Their surface layer is dark grayish brown loam. The subsoil is grayish brown and gray clay in the upper part and gray clay in the lower part. The underlying material is gray clay.

The Lenoir soils are somewhat poorly drained. Their surface layer is grayish brown loam. The subsurface layer is pale brown loam. The subsoil is light yellowish brown and gray silty clay in the upper part and gray clay and clay loam in the lower part.

The Craven soils are moderately well drained. Their surface layer is light yellowish brown fine sandy loam. The subsoil is brownish yellow silty clay or clay in the upper part and light gray and brownish yellow clay in the lower part. The underlying material is light gray and brownish yellow clay.

The major soils are used mainly as woodland and pasture. In a few areas they are used as cropland. The Leaf and Lenoir soils are poorly suited to use as cropland and suited to use as pasture and woodland. The Craven soils are suited to use as cropland, pasture, and woodland. Wetness is the main limitation.

The Craven soils are suited to most urban and recreation uses. The Leaf and Lenoir soils are poorly suited to these uses. Wetness and slow permeability are the main limitations.

4. Tarboro-Conetoe-Wickham

Nearly level and gently sloping, somewhat excessively drained and well drained soils that are sandy throughout or have a sandy or loamy surface layer and a loamy subsoil; on low river terraces

The major soils in this map unit are on low ridges near streams that flow into the Meherrin, Wiccacon, and Chowan Rivers and Potecasi Creek.

This map unit makes up 8 percent of the county. It is 24 percent Tarboro soils, 23 percent Conetoe soils, 18 percent Wickham soils, and 35 percent soils of minor extent, including Altavista, Leaf, Roanoke, Seabrook, and Tomotley soils.

The Tarboro soils are nearly level and are somewhat excessively drained. The surface layer is brown sand. The underlying material is yellowish brown and brownish yellow sand.

The Conetoe soils are nearly level and are well drained. The surface layer is grayish brown loamy sand. The subsurface layer is light yellowish brown loamy sand. The subsoil is strong brown and brownish yellow sandy loam. The underlying material is reddish yellow loamy sand.

The Wickham soils are nearly level and gently sloping and are well drained. The surface layer is brown sandy loam. The subsurface layer is light yellowish brown sandy loam. The subsoil is yellowish red sandy clay loam in the upper part and strong brown sandy loam in the lower part. The underlying material is strong brown and brownish yellow loamy sand.

The major soils are used mainly as cropland. In a few areas they are used as pasture and woodland. The Wickham soils are well suited to use as cropland, pasture, and woodland. The Conetoe soils are suited to these uses, and the Tarboro soils are suited to pasture but poorly suited to crops and trees. The low available water capacity and soil blowing are the main limitations. The soils are poorly suited to urban and recreation uses because of flooding.

5. Wilbanks

Nearly level, very poorly drained soils that are mainly clayey throughout; on flood plains

The major soil in this map unit is on flood plains of the Cutawhiskie and Ahoskie Creeks in the western part of the county. It is subject to frequent flooding.

This map unit makes up 2 percent of the county. It is 69 percent Wilbanks soils and 31 percent soils of minor extent, including Bibb, Dorovan, Leaf, and Wehadkee soils.

The Wilbanks soils are very poorly drained. The surface layer is dark grayish brown silty clay loam in the upper part and very dark gray, dark gray, black, and dark reddish brown silty clay in the lower part. The underlying material is dark reddish brown silty clay loam.

The soils are almost exclusively in woodland. They are poorly suited to use as cropland; however, they are suited to pasture if drainage is improved. They are poorly suited to most urban and recreation uses. Wetness and flooding are the main limitations.

6. Dorovan-Bibb-Wehadkee

Nearly level, very poorly drained and poorly drained soils that are mucky or loamy and underlain by sandy material or have a loamy surface layer and subsoil; in swamps or on flood plains

The major soils in this map unit are on flood plains and in large undrained swamps along the Meherrin, Chowan, and Wiccacon Rivers and the major creeks in the county.

This map unit makes up 13 percent of the county. It is 52 percent Dorovan soils, 35 percent Bibb soils, 8 percent Wehadkee soils, and 5 percent soils of minor extent, including Wilbanks and Winton soils.

The Dorovan soils are very poorly drained. They have a surface layer of black mucky peat. The subsurface layers are black muck. The underlying material is dark grayish brown fine sand.

The Bibb soils are poorly drained. The surface layer is very dark grayish brown loam. The subsurface layer is dark grayish brown sandy loam. The underlying material is gray sand in the upper part and yellow loamy sand in the lower part.

The Wehadkee soils are poorly drained. The surface layer is grayish brown silt loam. The subsoil is grayish brown and light brownish gray silt loam and loam in the upper part and light brownish gray and gray clay loam and silty clay loam in the lower part.

The major soils are almost exclusively in woodland. They are poorly suited to crops and pasture and to urban and recreation uses. Wetness and flooding are the main limitations. The Bibb and Wehadkee soils are suited to use as woodland. Only in a few areas that are protected from flooding are the Bibb and Wehadkee soils suited to crops and pasture.

Detailed Soil Map Units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under "Use and Management of the Soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

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

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Norfolk loamy fine sand, 0 to 2 percent slopes, is one of several phases in the Norfolk series.

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

A *soil complex* consists of two or more soils in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Craven-Urban land complex, 0 to 2 percent slopes, is an example.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, suitabilities, and capabilities, for many uses. The Glossary defines many of the terms used in describing the soils.

Soil Descriptions

AtA—Altavista fine sandy loam, 0 to 2 percent slopes. This is a moderately well drained soil on stream terraces. Individual areas are long and narrow and range from 5 to 50 acres .

Typically, the surface layer is brown fine sandy loam 10 inches thick. The subsoil is 40 inches thick. It is light yellowish brown or brown sandy clay loam in the upper part and light gray sandy loam in the lower part. The underlying material to a depth of 60 inches is light gray coarse sand and sandy loam.

The permeability is moderate, and the available water capacity is medium. The soil is very strongly acid to medium acid, except for the surface layer where lime has been added. A seasonal high water table is at a depth of 1.5 to 2.5 feet late in winter and early in spring. This soil is subject to rare flooding.

Included with this soil in mapping are a few small areas of the poorly drained Tomotley soils and the well drained Wickham soils. Areas of these soils are intermingled with areas of the Altavista soil. Also included are small areas of soils that have a loamy fine sand surface layer and a few small areas of soils that have either more silt or less clay than is typical for the Altavista soil.

In most areas this soil is used for cultivated crops. In the remaining areas it is used mainly as pasture or woodland.

This soil is well suited to corn, soybeans, peanuts, tobacco, cotton, and small grain. Rare flooding is the main limitation. Winter cover crops, minimum tillage, and crop residue management help maintain tilth and production. No-till planting, field borders, and a crop rotation that includes close-growing crops also help conserve soil. Artificial drainage is generally required to prevent tobacco from drowning during wet periods.

This soil is well suited to use as pasture and hayland.

If this soil is used as woodland, the overstory is dominantly black tupelo, elm, black cherry, yellow-poplar, sweetgum, hickory, red maple, American beech, willow oak, white oak, post oak, southern red oak, water oak, and loblolly pine. The understory is mainly dogwood, sweetbay, sourwood, American holly, southern waxmyrtle, and sassafras. Wetness is the main limitation to woodland use and management.

This soil is poorly suited to most urban uses. Wetness and the hazard of rare flooding are the main limitations. This soil is suited to most recreational uses. Wetness is the main limitation.

This soil is in capability subclass IIw and in woodland group 2w.

AuB—Autryville loamy sand, 0 to 5 percent slopes. This is a well drained soil on broad smooth areas on uplands. Individual areas are irregular in shape and range from 10 to 50 acres.

Typically, the surface layer is brown loamy sand 9 inches thick. The subsurface layer is light yellowish brown loamy sand 14 inches thick. The subsoil extends to a depth of 80 inches. It is strong brown sandy loam in the upper part, yellowish brown loamy sand in the middle part, and yellowish brown sandy loam in the lower part.

The permeability is moderately rapid in the upper part of the subsoil and moderate in the lower part. The available water capacity is low. The soil is very strongly acid or strongly acid except for the surface layer where lime has been added. The seasonal high water table is at a depth of 4 to 6 feet.

Included with this soil in mapping are a few areas of Bonneau soils, intermingled with areas of the Autryville soil. Also included are a few small areas of soil whose surface and subsurface layers combined are less than 20 inches thick.

In about half the areas this soil is used for cultivated crops. In the remaining areas it is mainly used as woodland and pasture. This soil is suited to corn, soybeans, peanuts, tobacco, and small grain. Leaching of plant nutrients, soil blowing, moderately rapid permeability, and low available water capacity are the main limitations. Blowing sand can damage young plants. Winter cover crops, minimum tillage, and crop residue management help conserve moisture. No-till planting, windbreaks, and a crop rotation that includes close growing crops help conserve soil and water. Fertilizer, particularly nitrogen, should be added in split applications.

This soil is suited to use for such forage as coastal bermudagrass and bahiagrass.

If this soil is used as woodland, the overstory is dominantly pine, longleaf pine, red maple, hickory, sweetgum, black tupelo, black cherry, American beach, southern red oak, white oak, and post oak. The understory is mainly dogwood, sassafras, American holly, sourwood, and southern waxmyrtle. The low available water capacity and the sandy surface layer are the main limitations to woodland use and management.

This soil is suited to most urban and recreational uses. Wetness and a sandy surface layer are the main limitations.

This soil is in capability subclass IIs and in woodland group 3s.

BB—Bibb soils. These are nearly level, poorly drained soils on flood plains throughout the county. Fewer than usual detailed observations were made in mapping these soils. The mapping, however, is detailed enough for the major anticipated uses. Individual areas of these soils are long and narrow and generally are 50 to several hundred acres.

Typically, the surface layer is very dark grayish brown loam 8 inches thick. The subsurface layer is dark grayish brown sandy loam 20 inches thick. The underlying material to a depth of 61 inches is gray sand in the upper part and yellow loamy sand in the lower part.

Permeability is moderate, and the available water capacity is high. The soils are very strongly acid or strongly acid except for the surface layer where lime has been added. The seasonal high water table is 0.5 foot to 1.5 feet below the surface. These soils are subject to common flooding.

Included with these soils in mapping are small areas of the very poorly drained Dorovan soils, which are intermingled throughout the mapped areas and areas of soils that are mucky in the upper part and have sandy layers at 14 to 18 inches below the surface. Also included are small areas of soils that have more clay between depths of 10 and 40 inches than is typical for Bibb soils.

In most areas these soils are used as woodland. A small acreage is used as pasture.

These soils are poorly suited to use as cropland or pasture. Flooding and wetness are the main limitations. Lack of suitable outlets is a limitation to the installation of drainage systems. If they are drained and protected from flooding, these soils are suited to use for such pasture forages as fescue and ladino clover.

If these soils are used as woodland, the overstory is dominantly baldcypress, pond pine, red maple, ash, hickory, sweetgum, black tupelo, elm, yellow-poplar, river birch, water oak, willow oak, and swamp white oak. The understory is mainly cedar, American holly, sweetbay, sourwood, reeds, and southern waxmyrtle. Wetness and flooding are the main limitations to woodland use and management.

These soils are poorly suited to most urban and recreational uses because of flooding and wetness.

These soils are in capability subclass Vw and in woodland group 2w.

BoB—Bonneau loamy sand, 0 to 6 percent slopes. This is a well drained or moderately well drained soil on

uplands. Individual areas are irregular in shape and range from 10 to more than 50 acres.

Typically, the surface layer is grayish brown loamy sand 9 inches thick. The subsurface layer is light yellowish brown loamy sand 15 inches thick. The subsoil to a depth of 63 inches is yellowish brown and brownish yellow sandy clay loam.

The permeability is moderate, and the available water capacity is low. The soil is very strongly acid or strongly acid, except for the surface layer where lime has been added. A seasonal high water table is 3.5 to 5 feet below the surface.

Included with this soil in mapping are a few small areas of the well drained Autryville and Norfolk soils and the moderately well drained Goldsboro soils. Areas of these soils are intermingled with areas of the Bonneau soil.

In most areas this soil is used for cultivated crops. In the remaining areas it is used mainly as woodland and pasture.

This soil is suited to corn, soybeans, peanuts, tobacco, and small grain. Wetness, soil blowing, and leaching of plant nutrients are the main limitations. Winter cover crops, minimum tillage, and crop residue management help conserve moisture. No-till planting, windbreaks, and a crop rotation that includes close growing crops help conserve soil and water. Fertilizer, particularly nitrogen, should be added in split applications.

This soil is suited to use for such pasture forage as coastal bermudagrass and bahiagrass.

If this soil is used as woodland, the overstory is dominantly loblolly pine, longleaf pine, red maple, hickory, sweetgum, black tupelo, black cherry, American beech, southern red oak, white oak, and post oak. The understory is mainly dogwood, sassafras, American holly, sourwood, and southern waxmyrtle. The low available water capacity and a sandy surface layer are the main limitations to woodland use and manangement.

This soil is suited to most urban and recreational uses. Wetness and a sandy surface layer are the main limitations.

This soil is in capability subclass IIs and in woodland group 2s.

BoC—Bonneau loamy sand, 6 to 12 percent slopes. This is a well drained or moderately well drained soil on uplands. Individual areas are long and irregular in shape and range from 10 to more than 50 acres.

Typically, the surface layer is brown loamy sand 9 inches thick. The subsurface layer is light yellowish brown loamy sand 15 inches thick. The subsoil to a depth of 63 inches is yellowish brown and brownish yellow sandy clay loam.

The permeability is moderate, and the available water capacity is low. The soil is very strongly acid or strongly acid, except for the surface layer where lime has been added. Erosion is a moderate hazard. A seasonal high water table is 3.5 to 5 feet below the surface.

Included with this soil in mapping are a few small areas of the well drained Norfolk soils. Areas of these soils are intermingled with areas of the Bonneau soil.

In most areas this soil is used for cultivated crops. In the remaining areas it is used mainly as woodland and pasture.

This soil is suited to corn, soybeans, peanuts, tobacco, and small grain. Wetness, the hazard of erosion, soil blowing, and leaching of plant nutrients are the main limitations. Winter cover crops, minimum tillage, and crop residue management help conserve moisture. No-till planting, windbreaks, and a crop rotation that includes close growing crops help conserve soil and water. Fertilizer, particularly nitrogen, should be added in split applications.

This soil is well suited to use for such pasture forage as coastal bermudagrass and bahiagrass.

If this soil is used as woodland, the overstory is dominantly loblolly pine, longleaf pine, red maple, hickory, sweetgum, black tupelo, black cherry, American beech, southern red oak, white oak, and post oak. The understory is mainly dogwood, sassafras, American holly, sourwood, and southern waxmyrtle. The low available water capacity and a sandy surface layer are the main limitations to woodland use and management.

This soil is suited to most urban and recreational uses. Wetness, a sandy surface layer, and slope are the main limitations.

This soil is in capability subclass IIIe and in woodland group 2s.

CaA—Caroline fine sandy loam, 0 to 2 percent slopes. This is a well drained soil on uplands. The individual areas of this soil are irregular in shape and range from 5 to 40 acres.

Typically, the surface layer is yellowish brown fine sandy loam 8 inches thick. The subsoil extends to a depth of 62 inches. It is yellowish brown clay loam in the upper part and strong brown and yellowish red clay loam in the lower part.

Permeability is moderately slow to slow, and the available water capacity is medium. The shrink-swell potential is moderate. The soil is extremely acid to strongly acid except for the surface layer where lime has been added.

Included with this soil in mapping are small areas of the well drained Norfolk soils. Also included are areas of a soil that is eroded. The included soil is redder than is typical for the Caroline series. It is slightly higher on the landscape than the Caroline soil and is intermingled throughout the mapped areas.

In most areas this soil is used for cultivated crops. In the remaining areas it is used as woodland and pasture.

This soil is well suited to corn, soybeans, peanuts, tobacco, cotton, and small grain. There are no major

limitations to use of the soil as cropland. Winter cover crops, minimum tillage, and crop residue management help maintain tilth and moisture content. No-till planting, field borders, and a crop rotation that includes close growing crops help conserve soil and water.

This soil is well suited to use as pasture.

In the wooded areas, the overstory is dominantly loblolly pine, red maple, hickory, yellow-poplar, black tupelo, American elm, black cherry, American beech, southern red oak, water oak, and winter oak. The understory is mainly dogwood, sassafras, sourwood, and southern waxmyrtle. There are no major limitations to woodland use and management.

This soil is suited to most urban and recreation uses. The moderately slow to slow permeability and the moderate shrink-swell potential are the main limitations.

This soil is in capability class I and in woodland group 3o.

CaB—Caroline fine sandy loam, 2 to 6 percent slopes. This is a well drained soil on uplands. The individual areas are irregular in shape and range from 5 to 30 acres.

Typically, the surface layer is brown fine sandy loam 5 inches thick. The subsurface layer is light yellowish brown fine sandy loam 3 inches thick. The subsoil extends to a depth of 62 inches. It is reddish yellow sandy clay loam in the upper part; reddish yellow or brown clay loam in the middle part; and mottled brown, reddish yellow, red, and light gray sandy clay in the lower part.

Permeability is moderately slow to slow, and the available water capacity is medium. The shrink-swell potential is moderate. The soil is extremely acid to strongly acid, except for the surface layer where lime has been added. Erosion is a moderate hazard.

Included with this soil in mapping are some small areas of the well drained Norfolk soils. Also included are a few small areas of a soil that has less clay in the lower part of the subsoil than is typical for Caroline soil. Also included are areas of a soil that is eroded. The included soil is redder than is typical for the Caroline series. It is slightly higher on the landscape than the Caroline soil and is intermingled throughout the mapped areas.

In most areas this soil is used for cultivated crops. In the remaining areas it is used as woodland and pasture.

This soil is well suited to corn, soybeans, peanuts, tobacco, cotton, and small grain. Slope, surface runoff, and susceptibility to erosion are the main limitations. Winter cover crops, minimum tillage, and crop residue management help control runoff and erosion and maintain tilth. Stripcropping, no-till plantings, field borders, and a crop rotation that includes close growing crops also help conserve soil and water.

This soil is well suited to grasses and legumes for pasture forage.

In the wooded areas, the overstory is dominantly loblolly pine, red maple, hickory, yellow-poplar, black tupelo, American elm, black cherry, American beech, southern red oak, water oak, and white oak. The understory is mainly dogwood, sassafras, sourwood, and southern waxmyrtle. There are no major limitations to woodland use and management.

This soil is suited to most urban and recreation uses. The moderately slow to slow permeability and the moderate shrink-swell potential are the main limitations.

This soil is in capability subclass IIe and in woodland group 3o.

CoB—Conetoe loamy sand, 0 to 5 percent slopes. This is a well drained soil on stream terraces. Individual areas are irregular in shape and range from 5 to 100 acres.

Typically, the surface layer is grayish brown loamy sand 9 inches thick. The subsurface layer is light yellowish brown loamy sand 15 inches thick. The subsoil is 15 inches thick. It is strong brown and brownish yellow sandy loam. The underlying material to a depth of 68 inches is reddish yellow loamy sand.

Permeability is moderately rapid, and the available water capacity is low. The soil is very strongly acid to medium acid except where lime has been added. The soil is rarely flooded.

Included with this soil in mapping are a few areas of the somewhat excessively drained Tarboro and well drained Wickham soils. These soils are intermingled throughout the mapped areas.

About half of the acreage of this soil is cultivated. The rest is in woodland and pasture.

This soil is suited to corn, soybeans, peanuts, tobacco, and small grain. The available water capacity, soil blowing, the moderately rapid permeability, and the hazard of flooding are the main limitations. Winter cover crops, minimum tillage, and crop residue management help conserve moisture. No-till planting, windbreaks, and a crop rotation that includes close growing crops also help conserve soil and water. Fertilizers, particularly nitrogen, should be added in split applications.

This soil is suited to such pasture forage as coastal bermudagrass and bahiagrass.

The overstory in the wooded areas consists mainly of loblolly pine, longleaf pine, red maple, hickory, sweetgum, black tupelo, black cherry, American beech, southern red oak, white oak, and post oak. The understory consists mainly of dogwood, sassafras, American holly, sourwood, and southern waxmyrtle. The low available water capacity and the sandy surface layer are the main limitations to woodland use and management.

This soil is poorly suited to most urban and recreation uses. Flooding and sandy material are the main limitations.

This soil is in capability subclass IIs and in woodland group 3s.

CrA—Craven fine sandy loam, 0 to 1 percent slopes. This is a moderately well drained soil on uplands. Individual areas are elliptical in shape and range from 5 to more than 50 acres.

Typically, the surface layer is light yellowish brown fine sand loam 7 inches thick. The subsoil is 45 inches thick. It is brownish yellow and yellowish brown silty clay and clay in the upper part and mottled gray, yellow, and brown clay in the lower part. The underlying material to a depth of 62 inches is mottled light gray and brownish yellow clay loam.

Permeability is slow, and the available water capacity is medium. The shrink-swell potential is moderate. The soil is very strongly acid or strongly acid, except for the surface layer where lime has been added. A seasonal high water table is 2 to 3 feet below the surface.

Included with this soil in mapping are small areas of the somewhat poorly drained Lenoir soils, generally in slight depressions. Also included are a few small areas of soils that have less clay than is typical for Craven soil. Areas of these soils are intermingled with areas of the Craven soil.

About half of the acreage of this soil is used for cultivated crops. Most of the rest is used as woodland. A small acreage is used as pasture.

This soil is suited to corn, soybeans, tobacco, cotton, peanuts, and small grain. Wetness and slow permeability are the main limitations. If it is not properly bedded, tobacco is subject to drowning during wet periods. Winter cover crops, minimum tillage, and crop residue management help maintain tilth and production. No-till planting, field borders, and a crop rotation that includes close growing crops help conserve moisture and prevent compaction of the subsoil. The slow permeability of the subsoil should be considered in installing a drainage system.

This soil is suited to use as pasture and hayland. Wetness is the main limitation.

In wooded areas, the overstory is dominantly black tupelo, elm, black cherry, yellow-poplar, sweetgum, hickory, red maple, American beech, willow oak, white oak, post oak, southern red oak, water oak, and loblolly pine. The understory is mainly dogwood, sweetbay, sourwood, American holly, southern waxmyrtle, and sassafras. Wetness is the main limitation to woodland use and management.

This soil is poorly suited to most urban uses. Wetness, the slow permeability, and the moderate shrink-swell potential are the main limitations. This soil is suited to most recreation uses. Wetness and the slow permeability are the main limitations.

This soil is in capability subclass IIw and in woodland group 3w.

CrB—Craven fine sandy loam, 1 to 4 percent slopes. This is a moderately well drained soil on uplands. Individual areas are irregular in shape and range from 5 to more than 50 acres.

Typically, the surface layer is yellowish brown fine sandy loam 7 inches thick. The subsoil is 49 inches thick. It is yellowish brown and reddish yellow clay in the upper part and yellowish brown and gray clay in the lower part. The underlying material to a depth of 75 inches is yellowish brown sandy loam.

The permeability is slow, and the available water capacity is medium. The shrink-swell potential is moderate. The soil is very strongly acid or strongly acid throughout, except for the surface layer where lime has been added. Erosion is a severe hazard. A seasonal high water table is 2 to 3 feet below the surface.

Included with this soil in mapping is the somewhat poorly drained Lenoir soil in slight depressions. Also included are small areas of soil whose subsoil is more than 30 percent silt. Areas of these soils are intermingled with areas of the Craven soil.

In about half the areas this soil is used for cultivated crops. In the remaining areas it is used mainly as pasture and woodland.

This soil is suited to corn, soybeans, peanuts, tobacco, cotton, and small grain. Wetness, slow permeability, and the hazard of erosion are the main limitations. Winter cover crops, minimum tillage, and crop residue management help maintain tilth and production. No-till planting, field borders, and a crop rotation that includes close growing crops help conserve soil. The slow permeability of the subsoil is a limitation to the use of a drainage system.

This soil is suited to use for pasture forage. Wetness and the slow permeability are the main limitations.

If this soil is used as woodland, the overstory is dominantly black tupelo, elm, black cherry, yellow-poplar, sweetgum, hickory, red maple, American beech, willow oak, white oak, post oak, southern red oak, water oak, and loblolly pine. The understory is mainly dogwood, sweetbay, sourwood, American holly, southern waxmyrtle, and sassafras. Wetness is the main limitation to woodland use and management.

This soil is poorly suited to most urban uses. Wetness, the slow permeability, and the moderate shrink-swell potential are the main limitations. This soil is suited to most recreation uses. Wetness and the slow permeability are the main limitations.

This soil is in capability subclass IIIe and in woodland group 3w.

CrC2—Craven fine sandy loam, 4 to 8 percent slopes, eroded. This is a moderately well drained soil on uplands. Individual areas are long and narrow and range from 5 to 30 acres.

Typically, the surface layer is light yellowish brown fine sandy loam 3 inches thick. The subsoil is 45 inches

thick. It is brownish yellow and very pale brown clay loam in the upper part and brownish yellow and gray clay in the lower part. The underlying material to a depth of 65 inches is yellowish brown sandy loam.

The permeability is slow, and the available water capacity is medium. The shrink-swell potential is moderate. The soil is very strongly acid or strongly acid, except for the surface layer where lime has been added. Erosion is a severe hazard. Sheet erosion and some small gullies are evident in most areas. A seasonal high water table is 2 to 3 feet below the surface.

Included with this soil in mapping are a few areas of the well drained Caroline soils. Also included are areas of soils that have a clay loam surface layer. Areas of these soils are intermingled with areas of the Craven soil.

In most areas this soil is used for cultivated crops. In the remaining areas it is used as woodland and pasture.

This soil is suited to corn, soybeans, peanuts, tobacco, cotton, and small grain. Slope, surface runoff, slow permeability, erosion, and poor tilth are the main limitations. Minimum tillage and crop and residue management help control runoff and erosion and maintain good tilth. Maintaining drainageways in sod, terraces and diversions, stripcropping, field borders, and a crop rotation that includes close growing crops help conserve soil.

This soil is suited to use as pasture forage. Wetness and the slow permeability are the main limitations.

If this soil is used as woodland, the overstory is dominantly black tupelo, elm, black cherry, yellow-poplar, sweetgum, hickory, red maple, American beech, willow oak, white oak, post oak, southern red oak, water oak, and loblolly pine. The understory is mainly dogwood, sweetbay, sourwood, American holly, southern waxmyrtle, and sassafras. Wetness is the main limitation to woodland use and management.

This soil is poorly suited to most urban uses. Wetness, the slow permeability, and the moderate shrink-swell potential are the main limitations. This soil is suited to most recreation uses (fig 1). Wetness and the slow permeability are the main limitations.

This soil is in capability subclass IVe and in woodland group 3w.

CrD2—Craven fine sandy loam, 8 to 12 percent slopes, eroded. This is a moderately well drained soil on uplands. Individual areas are long and narrow and range from 5 to 50 acres.

Typically, the surface layer is light yellowish brown fine sandy loam 3 inches thick. The subsoil is 45 inches thick. It is brownish yellow and very pale brown clay loam in the upper part and brownish yellow and gray clay in the lower part. The underlying material to a depth of 65 inches is yellowish brown sandy loam.

The permeability is slow, and the available water capacity is medium. The medium shrink-swell potential is moderate. The soil is very strongly acid or strongly acid, except for the surface layer where lime has been added. Erosion is a severe hazard. Sheet erosion and some small gullies are evident in most areas. A seasonal high water table is 2 to 3 feet below the surface.

Included with this soil in mapping are a few small areas of moderately well drained Bonneau soils. Also included are areas of soils that have a clay loam surface layer. Areas of these soils are intermingled with areas of the Craven soil.

In most areas this soil is used as woodland. In the remaining areas it is used as pasture.

This soil is poorly suited to corn, soybeans, and small grain. Slope, surface runoff, and the hazard of erosion are the main limitations. Minimum tillage and crop residue management help control runoff and erosion and maintain tilth. Maintaining drainageways in sod, terraces and diversions, stripcropping, contour farming, field borders, and a crop rotation that includes close growing crops help conserve soil and water.

This soil is suited to use for pasture forage. Maintaining adequate protective cover reduces runoff and controls erosion.

If this soil is used as woodland, the overstory is dominantly yellow-poplar, white oak, red maple, post oak, black cherry, southern red oak, water oak, sweet gum, hickory, sycamore, elm, ash, loblolly pine, and beech. The understory is mainly dogwood, sourwood, southern waxmyrtle, holly, and sassafras. There are no significant limitations to woodland use and management.

This soil is poorly suited to most urban uses. Slope, the slow permeability, and the moderate shrink-swell potential are the main limitations. This soil is suited to most recreation uses. Slope and the slow permeability are the main limitations.

This soil is in capability subclass VIe and in woodland group 3w.

CsA—Craven-Urban land complex, 0 to 2 percent slopes. This complex consists of areas of moderately well drained Craven soil and Urban land in or near the cities of Ahoskie and Winton. The areas are too small and too intricately mixed to be mapped separately. About 50 percent of the complex is Craven soil, 40 percent is Urban land, and the rest is included soils. Individual areas are irregular in shape and range from 5 to 640 acres.

Typically, the surface layer of the Craven soil is yellowish brown fine sandy loam 7 inches thick. The subsoil is 49 inches thick. It is yellowish brown and reddish yellow clay in the upper part and yellowish brown and gray clay in the lower part. The underlying material to a depth of 75 inches is yellowish brown sandy loam.

Permeability is slow, and the available water capacity is medium. The shrink-swell potential is moderate. The soil is very strongly acid or strongly acid, except for the

Figure 1.—This pond, in an area of Craven fine sandy loam, 4 to 8 percent slopes, eroded, is used for fishing and boating.

surface layer where lime has been added. A seasonal high water table is 2 to 3 feet below the surface.

Urban land consists of areas where the original soil has been cut, filled, graded, paved, or otherwise modified to the extent that classification is not possible. The areas are used for shopping centers, factories, municipal buildings, apartment complexes, parking lots, or other uses in which buildings are closely spaced or the soil is covered with pavement. The slope is generally modified during construction; the extent of the modification varies greatly.

Included with this complex in mapping are areas of the moderately well drained Goldsboro soils and the somewhat poorly drained Lenoir soils. They are intermingled throughout the mapped areas.

The runoff rate for this complex tends to be high because much of the surface is covered by impervious material. Runoff is particularly heavy during intense storms.

The Craven soil is poorly suited to urban uses. Wetness, the slow permeability, and the moderate shrink-swell potential are the main limitations.

This complex was not assigned to a capability subclass or to a woodland group.

DO—Dorovan soils. These are nearly level, very poorly drained organic soils on flood plains. Although the mapping of this unit is based on fewer detailed observations than for most of the other map units in the county, the detail is sufficient for the major anticipated uses. Individual areas are long and wide and range from 25 to more than 3,000 acres.

Typically, the surface layer consists of black, decomposed organic matter (mucky peat) 6 inches thick.

The subsurface organic layers to a depth of 70 inches are black muck. The underlying material to a depth of 85 inches is dark grayish brown fine sand.

The permeability is moderate, and the available water capacity is high. The organic layers are very strongly acid or strongly acid. A seasonal high water table is less than 0.5 foot below the surface. In many areas the soils are ponded for most of the year. These soils are subject to common flooding.

Included with these soils in mapping are areas of soil whose organic layers are less than 51 inches thick. Also included are areas where the subsurface material is clayey.

These soils are poorly suited to use as cropland or pasture and to urban or recreation uses. The seasonal high water table and flooding are the main limitations.

In all of the areas these soils are used as woodland. The overstory is dominantly blackgum, baldcypress, sweetbay, swamp tupelo, and some scattered loblolly pine. The understory is mainly greenbrier and sweetbay. Wetness and flooding are the main limitations to woodland use and management.

These soils are in capability subclass VIIw and in woodland group 4w.

ExA—Exum very fine sandy loam, 0 to 2 percent slopes. This is a moderately well drained soil in shallow depressions on uplands. Individual areas are irregular in shape and range from 5 to more than 50 acres.

Typically, the surface layer is grayish brown very fine sandy loam 8 inches thick. The subsoil to a depth of 62 inches is light yellowish brown. It is loam in the upper part, silty clay loam in the middle part, and silty clay in the lower part.

The permeability is moderate, and the available water capacity is high. The soil is very strongly acid or strongly acid, except for the surface layer where lime has been added. A seasonal high water table is 2 to 3 feet below the surface.

Included with this soil in mapping are a few small areas of Goldsboro soils. Also included are a few small areas of soils that have a fine sandy loam surface layer. Areas of the included soils are intermingled with areas of the Exum soil.

In most areas this soil is used for cultivated crops. In the remaining areas it is used mainly as woodland and pasture.

This soil is well suited to corn, soybeans, peanuts, tobacco, cotton, and small grain. Wetness is the main limitation. Winter cover crops, minimum tillage, and crop residue management help maintain tilth and production. No-till plantings, field borders, and a crop rotation that includes close growing crops help conserve soil. Artificial drainage is generally required to prevent tobacco from drowning during wet periods.

This soil is well suited to use for pasture forage.

If this soil is used as woodland, the overstory is dominantly black tupelo, elm, black, cherry, yellow-poplar, sweetgum, hickory, red maple, American beech, willow oak, post oak, southern red oak, water oak, and loblolly pine. The understory is mainly dogwood, sweetbay, sourwood, American holly, southern waxmyrtle, and sassafras. Wetness is the main limitation to woodland use and management.

This soil is suited to most urban and recreation uses. Wetness is the main limitation.

This soil is in capability subclass IIw and in woodland group 2w.

GoA—Goldsboro fine sandy loam, 0 to 2 percent slopes. This is a moderately well drained soil on uplands. Individual areas are irregular in shape and range from 5 to 100 acres.

Typically, the surface layer is dark grayish brown fine sandy loam 7 inches thick. The subsurface layer is light yellowish brown sandy loam 3 inches thick. The subsoil is 52 inches thick. It is yellowish brown and brownish yellow sandy clay loam in the upper part and mottled gray, strong brown, and red sandy clay loam in the lower part.

The permeability is moderate, and the available water capacity is medium. The soil is very strongly acid or strongly acid, except for the surface layer where lime has been added. A seasonal high water table is 2 to 3 feet below the surface.

Included with this soil in mapping are a few small areas of moderately well drained Exum soils, somewhat poorly drained Lynchburg soils, and well drained Norfolk soils. Also included are a few small areas of soils that have slopes of more than 2 percent and areas of a soil that has less clay than is typical for the Goldsboro soil. Areas of the included soils are intermingled with areas of the Goldsboro soil.

In most areas this soil is used for cultivated crops. In the remaining areas it is used mainly as woodland and pasture.

This soil is well suited to corn, soybeans, peanuts, tobacco, cotton, and small grain. Wetness is the main limitation. Winter cover crops, minimum tillage, and crop residue management help maintain tilth and production. No-till planting, field borders, and a crop rotation that includes close growing crops help conserve soil. Artificial drainage is generally required to prevent tobacco from drowning during wet periods.

This soil is well suited to use for pasture forage.

If this soil is used as woodland, the overstory is dominantly black tupelo, elm, black cherry, yellow-poplar, sweetgum, hickory, red maple, American beech, willow oak, white oak, post oak, southern red oak, water oak, and loblolly pine. The understory is mainly dogwood, sweetbay, sourwood, American holly, southern waxmyrtle, and sassafras. Wetness is the main limitation to woodland use and management.

This soil is suited to most urban and recreational uses. Wetness is the main limitation.

This soil is in capability subclass IIw and in woodland group 2w.

GpA—Goldsboro-Urban land complex, 0 to 2 percent slopes. This map unit consists of areas of the moderately well drained Goldsboro soil and Urban land in or near the city of Murfreesboro. The areas are too small and too intricately mixed to be mapped separately. About 50 percent of the map unit is Goldsboro soil, 30 percent is Urban land, and the rest is included soils. Most areas are irregular in shape and range from 5 to 30 acres.

Typically, the surface layer of the Goldsboro soil is dark grayish brown fine sandy loam 7 inches thick. The subsurface layer is light yellowish brown sandy loam 3 inches thick. The subsoil is 52 inches thick. It is yellowish brown and brownish yellow sandy clay loam in the upper part and mottled gray, strong brown, and red sandy clay loam in the lower part.

The permeability is moderate, and the available water capacity is medium. The soil is very strongly acid or strongly acid, except for the surface layer where lime has been added. A seasonal high water table is 2 to 3 feet below the surface.

Urban land consists of areas where the original soil has been cut, filled, graded, paved, or otherwise modified to the extent that it cannot be assigned to a soil series. These areas are now used for shopping centers, factories, municipal buildings, apartment complexes, parking lots, or other uses where buildings are closely spaced or the soil is covered with pavement. The slope is generally modified during construction; the extent of the modification varies greatly.

Included with this complex in mapping are small areas of Norfolk soils. Areas of these soils are intermingled with areas of this complex.

Because of the prevalence of areas where the soil is covered with impervious material, the runoff rate for this complex is higher than that for the Goldsboro soils that do not include Urban land. Runoff is particularly heavy during intense storms.

This complex is suited to urban uses. Wetness is the main limitation.

This complex has not been assigned to a capability subclass or a woodland group.

LF—Leaf loam. This is a nearly level, poorly drained soil on uplands. Fewer than usual detailed observations were made in mapping this soil. The mapping, however, is detailed enough for the major anticipated uses. The individual areas are irregular in shape and range from 10 to more than 4,000 acres.

Typically, the surface layer is very dark grayish brown loam 4 inches thick. The subsoil is 58 inches thick. It is grayish brown and gray clay in the upper part and gray clay in the lower part.

Permeability is very slow, and the available water capacity is high. The shrink-swell potential is high. The soil is very strongly acid or strongly acid except for the surface layer where lime has been added. A seasonal high water table is within 0.5 foot to 1.5 feet of the surface.

Included with this soil in mapping are small areas of the somewhat poorly drained Lenoir soils and the poorly drained Rains soils. These soils are intermingled throughout the mapped areas.

This soil is used mainly as woodland. In some areas it is used as pasture and for cultivated crops.

If it is drained, this soil is suited to corn, soybeans, and small grain. It is poorly suited to tobacco, cotton, and peanuts. Wetness and the very slow permeability are the main limitations. Minimum tillage, cover crops, and a cropping system that includes grasses and legumes help maintain tilth and production. Tillage is sometimes delayed in spring because of wetness. The lack of suitable outlets and the very slow permeability restrict the use of a drainage system.

This soil is suited to such pasture forage as fescue and ladino clover.

In wooded areas, the overstory is dominantly loblolly pine, pond pine, white oak, red maple, hickory, sweetgum, black tupelo, elm, water oak, and willow oak. The understory is mainly cedar, American holly, sweetbay, sourwood, reeds, southern waxmyrtle, sassafras, and blueberry. Wetness is the main limitation to woodland use and management.

This soil is poorly suited to most urban and recreational uses. Wetness, the very slow permeability, and the high shrink-swell potential are the main limitations.

This soil is in capability subclass IVw and in woodland group 2w.

Ln—Lenoir loam. This is a nearly level, somewhat poorly drained soil on uplands. The individual areas are irregular in shape and range from 10 to 200 acres.

Typically, the surface layer is grayish brown loam 3 inches thick. The subsoil is about 63 inches thick. It is pale brown, light yellowish brown, and gray silty clay in the upper part and light olive gray and gray clay and clay loam in the lower part.

Permeability is slow, and the available water capacity is medium. The shrink-swell potential is moderate. The soil is very strongly acid or strongly acid, except for the surface layer where lime has been added. A seasonal high water table is 1 foot to 2.5 feet below the surface.

Included with this soil in mapping are small areas of the poorly drained Leaf and Rains soils. Areas of these soils are intermingled with areas of the Lenoir soil.

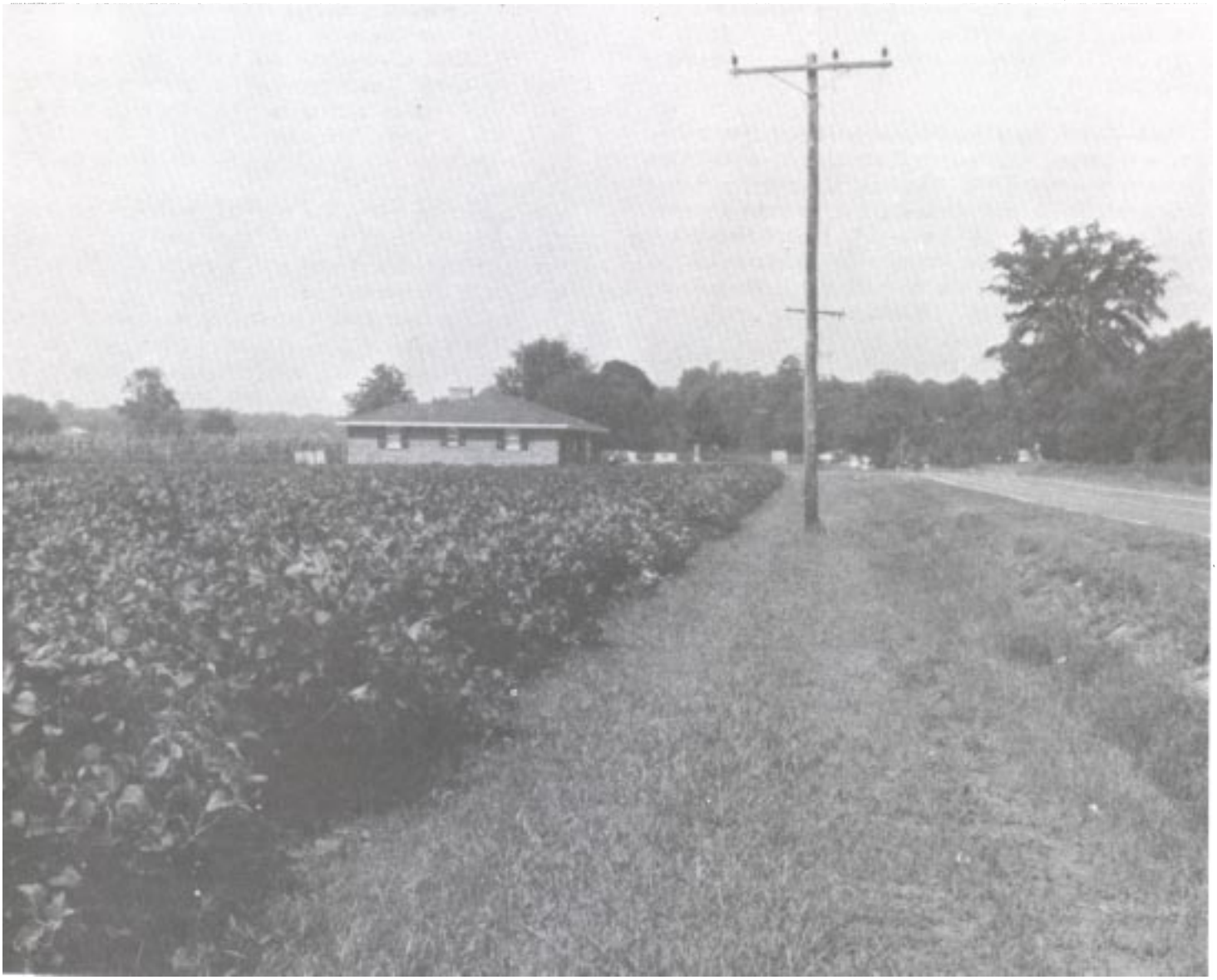


Figure 2.—Soybeans and field border, in an area of Lenoir loam.

In most areas this soil is used as woodland. In the remaining areas it is used mainly as pasture. In a few areas it is used for cultivated crops.

If it is drained, this soil is suited to corn, soybeans, and small grain (fig. 2). It is poorly suited to tobacco, cotton, and peanuts. Wetness is the main limitation. Minimum tillage, cover crops, and a cropping system that includes grasses and legumes help maintain tilth and production. Tillage is sometimes delayed in spring because of wetness. The lack of suitable outlets and the slow permeability restrict the use of a drainage system.

This soil is suited to such pasture forage as fescue and ladino clover.

In wooded areas, the overstory is dominantly loblolly pine, pond pine, white oak, red maple, hickory, sweetgum, black tupelo, elm, water oak, and willow oak. The understory is mainly cedar, American holly, sweetbay, sourwood, reeds, southern waxmyrtle, sassafras, and blueberry. Wetness is the main limitation to woodland use and management.

This soil is poorly suited to most urban and recreation uses. Wetness, the slow permeability, and the moderate shrink-swell potential are the main limitations.

This soil is in capability subclass IIIw and in woodland group 2w.

Ly—Lynchburg fine sandy loam. This is a nearly level, somewhat poorly drained soil on uplands. Individual areas are irregular in shape and range from 5 to 30 acres.

Typically, the surface layer is very dark grayish brown fine sandy loam 7 inches thick. The subsoil extends to a depth of 62 inches. It is pale brown fine sandy loam and sandy clay loam in the upper part and light gray sandy clay loam in the lower part.

The permeability is moderate, and the available water capacity is medium. The soil ranges from extremely acid to strongly acid, except for the surface layer where lime has been added. A seasonal high water table is 0.5 foot to 1.5 feet below the surface.

Included with this soil in mapping are a few areas of moderately well drained Goldsboro soils and poorly drained Rains soils. Also included are a few areas of a soil that has a sandy surface layer more than 20 inches thick. Areas of these soils are intermingled with areas of the Lynchburg soil.

In most areas this soil is used for cultivated crops. In the remaining areas it is used as woodland and pasture.

If it is drained, this soil is suited to corn, soybeans, peanuts, tobacco, cotton, and small grain. Winter cover crops, minimum tillage, and crop residue management help maintain tilth and production. No-till planting, field borders, and a crop rotation that includes close growing crops help conserve soil. Artificial drainage is generally required to prevent tobacco from drowning during wet periods.

This soil is suited to use for pasture forage.

If this soil is used as woodland, the overstory is dominantly black tupelo, elm, black cherry, yellow-poplar, sweetgum, hickory, red maple, American beech, willow oak, white oak, post oak, southern red oak, water oak, and loblolly pine. The understory is mainly dogwood, sweetbay, sourwood, American holly, southern waxmyrtle, and sassafras. Wetness is the main limitation to woodland use and management.

This soil is poorly suited to most urban and recreation uses. Wetness is the main limitation.

This soil is in capability subclass IIw and in woodland group 2w.

NoA—Norfolk loamy fine sand, 0 to 2 percent slopes. This is a well drained soil on uplands. Individual areas are irregular in shape and range from 5 to 30 acres.

Typically, the surface layer is dark grayish brown loamy fine sand 9 inches thick. The subsurface layer is light yellowish brown loamy fine sand 8 inches thick. The subsoil extends to a depth of 68 inches. It is yellowish brown sandy clay loam in the upper part and light gray sandy clay loam in the lower part.

The permeability is moderate, and the available water capacity is medium. The soil is very strongly acid or strongly acid, except for the surface layer where lime has been added. A seasonal high water table is 4 to 6 feet below the surface.

Included with this soil in mapping are a few small areas of moderately well drained Goldsboro soils, well drained Caroline soils, and moderately well drained Bonneau soils. Areas of the Bonneau and Goldsboro soils are intermingled with areas of the Norfolk soil.

In most areas this soil is used for cultivated crops. A few acres are used as pasture and woodland.

This soil is well suited to corn, soybeans, peanuts, tobacco, cotton, and small grain. There are no major limitations. Winter cover crops, minimum tillage, and crop residue management help maintain tilth. No-till planting, field borders, and a crop rotation that includes close growing crops help conserve soil and water.

This soil is well suited to use for pasture forage.

If this soil is used as woodland, the overstory is dominantly loblolly pine, red maple, hickory, yellow-poplar, black tupelo, American elm, black cherry, American beech, southern red oak, water oak, and white oak. The understory is mainly dogwood, sassafras, sourwood, and southern waxmyrtle. There are no major limitations to woodland use and management.

This soil is suited to most urban uses. Wetness is the main limitation. This soil is well suited to recreation uses.

This soil is in capability class I and in woodland group 2o.

NoB—Norfolk loamy fine sand, 2 to 6 percent slopes. This is a well drained soil on uplands. Individual areas are irregular in shape and range from 3 to more than 60 acres.

Typically, the surface layer is grayish brown loamy fine sand 7 inches thick. The subsurface layer is light yellowish brown loamy fine sand 5 inches thick. The subsoil extends to a depth of 66 inches. It is yellowish brown sandy clay loam in the upper part and brownish yellow or reddish yellow sandy clay loam in the lower part.

The permeability is moderate, and the available water capacity is medium. The soil is very strongly acid or strongly acid, except for the surface layer where lime has been added. Erosion is a moderate hazard. A seasonal high water table is 4 to 6 feet below the surface.

Included with this soil in mapping are a few areas of the well drained Caroline soils and the moderately well drained Bonneau soils. Also included are a few small areas where the soil is eroded.

In most areas this soil is used for cultivated crops. In the remaining areas it is used mainly as pasture or woodland.

This soil is well suited to corn, soybeans, peanuts, tobacco, cotton, and small grain. Winter cover crops,

minimum tillage, and crop residue management help control runoff and erosion and maintain tilth. Stripcropping, no-till planting, field borders and a crop rotation that includes close growing crops help conserve soil and water.

This soil is well suited to use for pasture forage.

If this soil is used as woodland, the overstory is dominantly loblolly pine, red maple, hickory, yellow-poplar, black tupelo, American elm, black cherry, American beech, southern red oak, water oak, and white oak. The understory is mainly dogwood, sassafras, sourwood, and southern waxmyrtle. There are no major limitations to woodland use and management.

This soil is suited to most urban uses. Wetness is the main limitation. This soil is well suited to recreation uses.

This soil is in capability subclass IIe and in woodland group 2o.

NoC—Norfolk loamy fine sand, 6 to 10 percent slopes. This is a well drained soil on uplands. Individual areas are long and narrow and range from 5 to 30 acres.

Typically, the surface layer is brown loamy fine sand 6 inches thick. The subsurface layer is light yellowish brown loamy fine sand 5 inches thick. The subsoil extends to a depth of 66 inches. It is yellowish brown sandy clay loam in the upper part and brownish yellow or reddish yellow sandy clay loam in the lower part.

The permeability is moderate, and the available water capacity is medium. The soil is very strongly acid or strongly acid, except for the surface layer where lime has been added. Erosion is a severe hazard. A seasonal high water table is 4 to 6 feet below the surface.

Included with this soil in mapping are a few areas of the moderately well drained Bonneau soils. Also included are small areas of soils that have a sandy clay loam surface layer. Areas of the included soils are intermingled with areas of the Norfolk soil.

In most areas this soil is used as woodland. In the remaining areas it is used mainly as pasture or for cultivated crops.

This soil is suited to corn, soybeans, peanuts, tobacco, cotton, and small grain. Surface runoff, slope, and the hazard of erosion are the main limitations. Winter cover crops, minimum tillage, and crop residue management help control runoff and erosion and maintain tilth. Stripcropping, no-till planting, field borders, terraces, and a crop rotation that includes close growing crops help conserve soil and water.

This soil is well suited to use for pasture forage.

If this soil is used as woodland, the overstory is dominantly loblolly pine, red maple, hickory, yellow-poplar, black tupelo, American elm, black cherry, American beech, southern red oak, water oak, and white oak. The understory is mainly dogwood, sassafras, sourwood, and southern waxmyrtle. There are no major limitations to woodland use and management.

This soil is suited to most urban and recreation uses. Slope and the hazard of erosion are the main limitations.

This soil is in capability subclass IIIe and in woodland group 2o.

Ra—Rains fine sandy loam. This is a nearly level, poorly drained soil on uplands. Individual areas are irregular in shape and range from 5 to more than 50 acres.

Typically, the surface layer is very dark brown fine sandy loam 9 inches thick. The subsoil is light brownish gray and light gray sandy clay loam 53 inches thick.

The permeability is moderate, and the available water capacity is medium. The soil is very strongly acid or strongly acid, except for the surface layer where lime has been added. A seasonal high water table is 1 foot below the surface. In low-lying areas this soil is subject to ponding for brief periods.

Included with this soil in mapping are a few small areas of the moderately well drained Goldsboro soils and the somewhat poorly drained Lynchburg soils. Areas of these soils are intermingled with areas of the Rains soil.

In about half the areas this soil is used for cultivated crops. In the remaining areas it is used mainly as woodland and pasture.

If it is drained, this soil is suited to corn, soybeans, and small grain. Wetness is the main limitation. It is poorly suited to tobacco, cotton, and peanuts. Minimum tillage, cover crops, and a cropping system that includes grasses and legumes help maintain tilth and production. Tillage is sometimes delayed in spring because of wetness. Lack of suitable outlets is a limitation to the use of a drainage system.

This soil is suited to use for such pasture forage as fescue and ladino clover.

If this soil is used as woodland, the overstory is dominantly loblolly pine, pond pine, white oak, red maple, hickory, sweetgum, black tupelo, elm, water oak, and willow oak. The understory is mainly cedar, American holly, sweetbay, sourwood, reeds, southern waxmyrtle, sassafras, and blueberry. Wetness is the main limitation to woodland use and management.

This soil is poorly suited to most urban and recreation uses. Wetness is the main limitation.

This soil is in capability subclass IVw, undrained, and subclass IIIw, drained, and in woodland group 2w.

Ro—Roanoke loam. This is a nearly level, poorly drained soil on stream terraces. Individual areas are irregular in shape and range from 5 to more than 100 acres.

Typically, the surface layer is dark grayish brown loam 7 inches thick. The subsoil is 48 inches thick. It is dark gray clay and clay loam in the upper part and dark gray sandy clay loam in the lower part. The underlying material to a depth of 62 inches is gray sandy loam.

The permeability is slow, and the available water capacity is medium. The shrink-swell potential is moderate. The soil is very strongly acid or strongly acid, except for the surface layer where lime has been added. A seasonal high water table is 1 foot below the surface. This soil is subject to rare flooding for brief periods.

Included with this soil in mapping are a few areas of the poorly drained Tomotley soils and the moderately well drained Seabrook soils. Areas of these soils are intermingled with areas of the Roanoke soil.

In about half the areas this soil is used as woodland In the remaining areas it is used mainly as pasture and for cultivated crops.

If it is drained and protected from flooding, this soil is suited to corn, soybeans, and small grain. It is poorly suited to tobacco, cotton, and peanuts. Wetness and flooding are the main limitations. Minimum tillage, cover crops, and a cropping system that includes grasses and legumes help maintain tilth and production. Tillage is sometimes delayed in spring because of wetness. Lack of suitable outlets and the slow permeability are limitations to the use of a drainage system.

This soil is suited to use for such pasture forage as fescue and ladino clover.

If this soil is used as woodland, the overstory is dominantly baldcypress, pond pine, loblolly pine, red maple, ash, hickory, sweetgum, black tupelo, elm, river birch, water oak, willow oak, and swamp oak. The understory is mainly cedar, American holly, sweetbay, sourwood, reeds, and southern waxmyrtle. Wetness and flooding are the main limitations to woodland use and management.

This soil is poorly suited to most urban and recreational uses. Flooding, wetness, the slow permeability, and the moderate shrink-swell potential are the main limitations.

This soil is in capability subclass Vw, undrained, and subclass IIIw, drained, and in woodland group 2w.

RuA—Rumford loamy sand, 0 to 3 percent slopes. This is a well drained or somewhat excessively drained soil on uplands. Individual areas are irregular in shape and range from 10 to 30 acres.

Typically, the surface layer is brown loamy sand 6 inches thick. The subsurface layer is yellowish brown loamy sand 8 inches thick. The subsoil is strong brown sandy loam 24 inches thick. The underlying material to a depth of 63 inches is brownish yellow and yellow fine sand and loamy sand.

The permeability is moderately rapid, and the available water capacity is low. The soil is very strongly acid or strongly acid, except for the surface layer where lime has been added.

Included with this soil in mapping are a few areas of well drained Norfolk soils. Areas of these soils are intermingled with areas of the Rumford soil.

In about two-thirds of the areas this soil is used for cultivated crops. In the remaining areas it is used mainly as woodland.

This soil is suited to corn, soybeans, peanuts, tobacco, and small grain. The low available water capacity, moderately rapid permeability, soil blowing, and leaching of plant nutrients are the main limitations. Winter cover crops, minimum tillage, and crop residue management help conserve moisture. No-till plantings, windbreaks, and a crop rotation that includes close growing crops help conserve soil and water. Fertilizer, particularly nitrogen, should be added in split applications.

This soil is suited to use for such pasture forage as coastal bermudagrass and bahiagrass.

If this soil is used as woodland, the overstory is dominantly loblolly pine, longleaf pine, red maple, hickory, sweetgum, black tupelo, black cherry, American beech, southern red oak, white oak, and post oak. The understory is mainly dogwood, sassafras, American holly, sourwood, and southern waxmyrtle. The low available water capacity is the main limitation.

This soil is well suited to most urban uses. It is suited to most recreation uses. The sandy surface layer is the main limitation.

This soil is in capability subclass IIs and in woodland group 3o.

Se—Seabrook loamy sand. This is a nearly level, moderately well drained soil on stream terraces. Individual areas are irregular in shape and range from 5 to 30 acres.

Typically, the surface layer is dark brown loamy sand 8 inches thick. The underlying material to a depth of 61 inches is yellowish brown sand in the upper part, pale brown sand in the middle part, and light brownish gray and gray sand in the lower part.

The permeability is rapid, and the available water capacity is low. The soil ranges from very strongly acid to slightly acid, except for the surface layer where lime has been added. A seasonal high water table is 2 to 4 feet below the surface. This soil is subject to rare flooding.

Included with this soil in mapping are a few small areas of the somewhat excessively drained Tarboro soils. These soils are in slightly higher positions on the landscape than the Seabrook soil.

In most areas this soil is used as woodland. In the remaining areas it is used mainly for cultivated crops and as pasture.

If it is drained, this soil is suited to corn, soybeans, peanuts, tobacco, and small grain. Wetness and susceptibility to leaching are the main limitations. The low available water capacity is a limitation during dry periods. Winter cover crops, minimum tillage, and crop residue management help maintain tilth and production. No-till planting, field borders, and a crop rotation that includes close growing crops also help conserve soil and

water. Artificial drainage is generally required to prevent tobacco from drowning during wet periods. Fertilizer, especially nitrogen, should be added in split applications.

This soil is suited to use for pasture forage.

If this soil is used as woodland, the overstory is dominantly black, tupelo, elm, black cherry, yellow-poplar, sweetgum, hickory, red maple, American beech, willow oak, white oak, post oak, southern red oak, water oak, and loblolly pine. The understory is mainly dogwood, sweetbay, sourwood, American holly, southern waxmyrtle, and sassafras. Wetness is the main limitation to woodland use and management.

This soil is poorly suited to most urban and recreation uses. Wetness, rapid permeability, and the hazard of flooding are the main limitations.

This soil is in capability subclass IIIs and in woodland group 3s.

TaB—Tarboro sand, 0 to 5 percent slopes. This is a somewhat excessively drained soil on stream terraces throughout the county. The individual areas are long and narrow and are 5 to more than 50 acres.

Typically, the surface layer is brown sand 7 inches thick. The underlying material to a depth of 85 inches is yellowish brown and brownish yellow sand.

Permeability is rapid, and the available water capacity is low. The soil ranges from strongly acid to slightly acid if lime has not been added. This soil is subject to rare flooding for brief periods.

Included with this soil in mapping are a few small areas of well drained Conetoe soils and moderately well drained Seabrook soils. The Conetoe soils are intermingled throughout the mapped areas. The Seabrook soils are in slightly lower positions on the landscape than the Tarboro soil.

About half of the acreage of this soil is cultivated. The rest is mainly used as woodland. A small acreage is used as pasture.

This soil is poorly suited to corn and soybeans. The low available water capacity, the leaching of plant nutrients, flooding, rapid permeability, and soil blowing are the main limitations. Blowing sand can damage young plants. Minimum tillage, crop residue management, windbreaks, and close growing grasses and legumes in a cropping system help control soil blowing and conserve moisture. Fertilizers, particularly nitrogen, should be added in split applications.

The overstory in the wooded areas consists mainly of loblolly pine, longleaf pine, sweetgum, southern red oak, blackjack oak, white oak, post oak, and red maple. The understory consists mainly of dogwood, sassafras, and American holly. The available water capacity and the sandy surface layer are the main limitations.

This soil is poorly suited to most urban and recreation uses because of flooding, although a rare occurrence, the rapid permeability, and the sandy surface layer.

This soil is in capability subclass IIIs and in woodland group 4s.

To—Tomotley fine sandy loam. This is a nearly level, poorly drained soil on terraces. Individual areas are irregular in shape and range from 5 to more than 50 acres.

Typically, the surface layer is dark grayish brown fine sandy loam about 11 inches thick. The subsurface layer is light brownish gray fine sandy loam 4 inches thick. The subsoil is light gray sandy clay loam 17 inches thick. The underlying material to a depth of 60 inches is light gray and white sand and coarse sand.

The permeability is moderate to moderately slow, and the available water capacity is medium. The soil is very strongly acid or strongly acid, except for the surface layer where lime has been added. A seasonal high water table is within 1 foot of the surface. This soil is subject to rare flooding for brief periods.

Included with this soil in mapping are a few small areas of poorly drained Roanoke soils. These soils are on the slightly higher terraces.

In most areas this soil is used as woodland. In the remaining areas it is used for cultivated crops.

If it is drained, this soil is suited to corn, soybeans, and small grain. It is poorly suited to tobacco, cotton, and peanuts. Wetness is the main limitation. Minimum tillage, cover crops, and a cropping system that includes grasses and legumes help maintain tilth and production. Tillage is sometimes delayed in spring because of wetness. Lack of suitable outlets is a limitation to the use of a drainage system.

This soil is suited to use for such pasture forage as fescue and ladino clover.

If this soil is used as woodland, the overstory is dominantly loblolly pine, sweetgum, and water tupelo. The understory is mainly sweetbay, sourwood, and southern waxmyrtle. If the soil is not drained and bedded, tree seeds and seedlings have a low survival rate or grow poorly. Competing vegetation can be controlled by site preparation, spraying, cutting, or girdling. Wetness is a limitation to the use of equipment for planting and harvesting trees.

This soil is poorly suited to most urban and recreation uses. Wetness and flooding are the main limitations.

This soil is in capability subclass IVw, undrained, and subclass IIIw, drained, and in woodland group 2w.

Ud—Udorthents, sandy. This map unit consists of areas where the soil materials have been removed for road subgrade material, building construction, or other uses. There are some areas where the soil overburden has been removed to expose large areas of sandy material that is being mined to make concrete.

This map unit is so variable that most soil interpretations require onsite investigation. The borrow pits support vegetation, mainly pines and shrubs,

although the suitability for growing plants has not been established.

This map unit is not assigned to a capability subclass or a woodland group.

WaB—Wakulla sand, 0 to 4 percent slopes. This is a somewhat excessively drained soil on uplands. Individual areas are irregular in shape and range from 5 to more than 50 acres.

Typically, the surface layer is dark grayish brown sand 8 inches thick. The subsurface layer is yellowish brown sand 18 inches thick. The underlying material to a depth of 72 inches is yellowish brown and brown loamy sand and sand.

The permeability is rapid, and the available water capacity is low. The soil is very strongly acid or strongly acid, except for the surface layer where lime has been added.

Included with this soil in mapping are a few small areas of the well drained Norfolk soils and the well drained or somewhat excessively drained Rumford soils. Areas of these soils are intermingled with areas of the Wakulla soil.

In about half the areas this soil is used for cultivated crops. In the remaining areas it is used mainly as woodland. In a few acres it is used as pasture.

This soil is suited to a few crops, peanuts, for example. It is poorly suited to corn and soybeans. The low available water capacity, leaching of plant nutrients, and soil blowing are the main limitations. Blowing sand can damage young plants. Minimum tillage, crop residue management, windbreaks, and a cropping system that includes close growing grasses and legumes help control soil blowing and conserve moisture. Fertilizer, particularly nitrogen, should be added in split applications.

This soil is suited to use for such pasture forage as coastal bermudagrass and bahiagrass.

If this soil is used as woodland, the overstory is dominantly loblolly pine, longleaf pine, sweetgum, southern red oak, blackjack oak, white oak, post oak, and red maple. The understory is mainly dogwood, sassafras, and American holly. The low available water capacity is the main limitation.

This soil is suited to most urban and recreation uses. The sandy surface layer is the main limitation.

This soil is in capability subclass IIIs and in woodland group 3s.

We—Wehadkee silt loam. This is a nearly level, poorly drained soil on flood plains of the Meherrin River and its major tributaries. The individual areas in places are long and narrow; in other places they are broad flats. The areas are 50 to more than 100 acres.

Typically, the surface layer is grayish brown silt loam 4 inches thick. The underlying material to a depth of 61 inches is grayish brown and light brownish gray silt loam and loam in the upper part and light brownish gray and gray clay loam and silty clay loam in the lower part.

Permeability is moderate, and the available water capacity is high. The soil is very strongly acid to slightly acid unless the surface has been limed. The seasonal high water table is at or near the surface most of the year. This soil is subject to common flooding.

Included with this soil in mapping are small areas of soils that are better drained, some areas of soils that are sandier throughout, and soils that have a thin organic surface layer. The included soils are intermingled throughout the mapped areas.

This soil is mainly used for mixed hardwoods. A small acreage is used as pasture.

This soil is poorly suited to most agricultural uses because of the seasonal high water table and the hazard of flooding. Outlets for drainage ditches are difficult to establish. If it is drained and protected from flooding, this soil is suited to corn, soybeans, small grain, and pasture. Winter cover crops, minimum tillage, and crop residue management help maintain tilth and production.

If this soil is used as woodland, the overstory is dominantly yellow-poplar, sweetgum, water oak, and loblolly pine. The understory is mainly sweetbay, sourwood, American holly, and southern waxmyrtle. Wetness is the main limitation to woodland use and management.

This soil is poorly suited to most urban and recreation uses. Wetness and the hazard of flooding are the main limitations.

This soil is in capability subclass IVw, drained, and in subclass Vlw, drained, and in woodland group 1w.

WkA—Wickham sandy loam, 0 to 2 percent slopes. This is a well drained soil on stream terraces in the northern part of the county. The individual areas are irregular in shape and range from 5 to 100 acres.

Typically, the surface layer is brown sandy loam 4 inches thick. The subsurface layer is light yellowish brown sandy loam 11 inches thick. The subsoil is 28 inches thick. It is yellowish red sandy clay loam in the upper part and strong brown sandy loam in the lower part. The underlying material to a depth of 67 inches is strong brown and brownish yellow loamy sand.

Permeability is moderate, and the available water capacity is medium. The soil is very strongly acid or strongly acid except for the surface layer where lime has been added. This soil is subject to rare flooding.

Included with this soil in mapping are a few small areas of the moderately well drained Altavista soils, the well drained Conetoe soils, and the somewhat excessively drained Tarboro soils. Also included are some small areas of soils that have sandy material at a depth of less than 40 inches. The included soils are intermingled throughout the mapped areas.

Most of the acreage of this soil is cultivated. The rest is mainly used as woodland and pasture.

This soil is well suited to corn, soybeans, peanuts, tobacco, cotton, and small grain. Flooding, although a rare occurrence, is the main limitation. Winter cover crops, minimum tillage, and crop residue management help to control runoff and erosion and to maintain tilth. No-till planting, field borders, and a crop rotation that includes close growing crops help conserve soil and water.

This soil is well suited to grasses and legumes for pasture forage.

In wooded areas, the overstory consists mainly of loblolly pine, red maple, hickory, yellow-poplar, black tupelo, American elm, black cherry, American beech, southern red oak, and white oak. The understory consists mainly of dogwood, sassafras, sourwood, and southern waxmyrtle. There are no major limitations to woodland use and management.

This soil is poorly suited to most urban and recreational uses. Flooding is the main limitation.

This soil is in capability class I and in woodland group 2o.

WkB—Wickham sandy loam, 2 to 6 percent slopes. This is a well drained soil on stream terraces in the northern part of the county. The individual areas are irregular in shape and range from 5 to 60 acres.

Typically, the surface layer is brown sandy loam 4 inches thick. The subsurface layer is light yellowish brown sandy loam 13 inches thick. The subsoil is 26 inches thick. It is yellowish red sandy clay loam in the upper part and strong brown sandy loam in the lower part. The underlying material to a depth of 67 inches is strong brown and brownish yellow loamy sand.

Permeability is moderate, and the available water capacity is medium. The soil is very strongly acid or strongly acid except for the surface layer where lime has been added. This soil is subject to rare flooding.

Included with this soil in mapping are a few small areas of the well drained Conetoe soils and the somewhat excessively drained Tarboro soils and some small areas of soils that have sandy material at a depth of less than 40 inches. The included soils are intermingled throughout the mapped areas.

Most of the acreage of this soil is cultivated. The rest is mainly used as woodland and pasture.

This soil is well suited to corn, soybeans, peanuts, tobacco, cotton, and small grain. Winter cover crops, minimum tillage, and crop residue management help to control runoff and erosion and to maintain tilth. Conservation practices such as no-till planting, field borders, and a crop rotation that includes close growing crops help conserve soil and water.

This soil is well suited to grasses and legumes for pasture forage.

In wooded areas, the overstory consists mainly of loblolly pine, red maple, yellow-poplar, hickory, black tupelo, American elm, black cherry, American beech, southern red oak, water oak, and white oak. The understory consists mainly of dogwood, sassafras, sourwood, and southern waxmyrtle. There are no major limitations to woodland use and management.

This soil is poorly suited to most urban and recreational uses. Flooding is the main limitation.

This soil is in capability subclass IIe and in woodland group 2o.

WN—Wilbanks silty clay loam. This is a nearly level, very poorly drained soil on flood plains in the southwestern part of the county. Fewer than usual detailed observations were made in mapping this soil. The mapping, however, is detailed enough for the major anticipated uses. There are two mapped areas of this soil; the areas are long and narrow and are more than 600 acres.

Typically, the surface layer is 50 inches thick. It is dark grayish brown silty clay loam in the upper part and very dark gray, dark gray, black, and dark reddish brown silty clay in the lower part. The underlying material to a depth of 64 inches is dark reddish brown silty clay loam.

Permeability is slow to moderately slow, and the available water capacity is high. The shrink-swell potential is moderate. The soil is very strongly acid or strongly acid, except for the surface layer where lime has been added. A seasonal high water table is at or near the surface for 3 to 5 months in most years. This soil is subject to frequent flooding for brief periods.

Included with this soil in mapping are a few areas of Bibb and Dorovan soils. Areas of these soils are intermingled throughout with areas of the Wilbanks soil.

Most of the acreage of this soil is in mixed hardwoods. A small acreage has been cleared for agricultural uses.

This soil is poorly suited to most agricultural uses because of the seasonal high water table and the hazard of flooding. Outlets for drainage ditches are difficult to establish. If it is drained and protected from flooding, this soil is suited to corn, soybeans, small grain, and pasture. Winter cover crops, minimum tillage, and crop residue management help maintain tilth and production. The moderately slow permeability of the subsoil is a limitation to the use of a drainage system.

If this soil is used as woodland, the overstory is dominantly water tupelo, sweetgum, water oak, and loblolly pine. The understory is mainly sweetbay, sourwood, American holly, and southern waxmyrtle. Wetness is the main limitation to woodland use and management.

This soil is poorly suited to most urban and recreation uses. Wetness, slow to moderately slow permeability, the moderate shrink-swell potential, and the hazard of flooding are the main limitations.

This soil is in capability subclass IVw, drained, and in subclass VIw, undrained, and in woodland group 1w.

WT—Winton soils, 12 to 60 percent slopes. These are well drained and moderately well drained soils on bluffs along rivers and their major tributaries. Although the mapping of this unit is based on fewer detailed observations than for most of the other map units in the county, the detail is sufficient for the major anticipated uses. Individual areas are long and narrow and range from 25 to 200 acres.

Typically, the surface layer is dark grayish brown fine sandy loam 4 inches thick. The subsurface layer is grayish brown sandy loam 7 inches thick. The subsoil is brownish yellow clay loam and sandy loam 24 inches thick.

The permeability is moderately slow to moderate, and the available water capacity is medium. The soil ranges from very strongly acid to medium acid throughout. A perched water table may be present for short periods. Erosion is a severe hazard if the soil is exposed.

Included with these soils in mapping are a few areas of the moderately well drained Bonneau and Craven soils and the well drained Norfolk soils. Areas of these soils are generally intermingled on the upper part of the slopes of this map unit. Also included are areas of soils that have a sandy surface layer that is more than 20 inches thick, and areas of soils that are sandy throughout. Areas of these soils are intermingled on the lower parts of the slopes of the map unit.

Most areas of these soils are used as woodland.

These soils are poorly suited to agricultural, urban, and recreation uses. Slope is the main limitation.

If these soils are used as woodland, the overstory is dominantly southern red oak, sweetgum, and beech. The understory is mainly sourwood, American holly, and flowering dogwood. Slope is the main limitation to woodland use and management.

These soils are in capability subclass VIIe and in woodland group 3r.

Prime Farmland

In this section, prime farmland is defined and discussed, and the prime farmland soils in Hertford County are listed.

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

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

Prime farmland soils may presently be in use as cropland, pasture, or woodland, or they may be in other uses. They either are used for producing food or fiber or are available for these uses. Urban or built-up land and water areas cannot be considered prime farmland.

Prime farmland soils usually get an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The acidity or alkalinity level of the soils is acceptable. The soils have few or no rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods and are not subject to frequent flooding during the growing season. The slope ranges mainly from 0 to 6 percent.

Soils that have a high water table, are subject to flooding, or are droughty may qualify as prime farmland soils if the limitations are overcome by drainage, flood control, or irrigation. Onsite evaluation is necessary to determine the effectiveness of corrective measures. More information on the criteria for prime farmland soils can be obtained at the local office of the Soil Conservation Service.

About 82,297 acres, or about 36 percent of the county, is prime farmland. The areas of prime farmland are distributed fairly evenly throughout the county.

A recent trend in land use has been the conversion of some prime farmland to urban and industrial uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are wet, more erodible, droughty, or difficult to cultivate and less productive than prime farmland.

The following map units, or soils, make up prime farmland in Hertford County. On some soils included in the list, appropriate measures have been applied to overcome a hazard or limitation, such as flooding, wetness, or droughtiness. The location of each map unit is shown on the detailed soil maps at the back of this publication. The extent of each unit is given in table 4. The soil qualities that affect use and managment are described in the section "Detailed soil map units." This list does not constitute a recommendation for a particular land use.

AtA Altavista fine sandy loam, 0 to 2 percent slopes
CaA Caroline fine sandy loam, 0 to 2 percent slopes
CaB Caroline fine sandy loam, 2 to 6 percent slopes
CrA Craven fine sandy loam, 0 to 1 percent slopes
CrB Craven fine sandy loam, 1 to 4 percent slopes
ExA Exum very fine sandy loam, 0 to 2 percent slopes
GoA Goldsboro fine sandy loam, 0 to 2 percent slopes
NoA Norfolk loamy fine sand, 0 to 2 percent slopes
NoB Norfolk loamy fine sand, 2 to 6 percent slopes
NoC Norfolk loamy fine sand, 6 to 10 percent slopes
WkA Wickham sandy loam, 0 to 2 percent slopes
WkB Wickham sandy loam, 2 to 6 percent slopes

Important Farmland

Farmland of state and local importance consists of soils other than those designated prime farmland. In one or more ways, their characteristics do not meet the requirements for prime farmland. However, they are suited to the economic production of crops if managed according to modern farming methods, including practices needed to control excess water.

Farmland of state and local importance may presently be used as cropland, pasture, woodland, or in other uses. It either is used for producing food or fiber or is available for these uses. Urban or build-up land and water areas cannot be considered important farmland.

For detailed information on the criteria used in designating important farmland, consult the local staff of the Soil Conservation Service.

About 7,577 acres, or 3 percent of the county, is farmland of state and local importance. The following map units make up important farmland.

BoB Bonneau loamy sand, 0 to 6 percent slopes
RuA Rumford loamy sand, 0 to 3 percent slopes

Use and Management of the Soils

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

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

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where wetness can cause difficulty in excavation.

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

Crops and Pasture

A.B. Whitley III, district conservationist, Hertford County, Winton, N.C., and Foy Hendrix, conservation agronomist, Soil Conservation Service, Raleigh, N.C., helped prepare this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed Soil Map Units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

According to the 1978 Census of Agriculture, Hertford County had approximately 56,272 acres in crops and 1,518 acres in pasture and hayland. Corn was grown on 20,899 acres; tobacco on 2,906 acres; soybeans on 9,883 acres; peanuts on 14,415 acres; cotton on 423 acres; and small grain on 247 acres. All other crops made up the remaining 7,499 acres. Pasture and hayland is planted almost entirely in tall fescue. The acreage available for crop production has changed very little since 1970. Losses of cropland to urban growth have been offset by new land clearing operations.

Soil erosion is a hazard on about 52 percent of the cropland in the county. This hazard is most serious on the Craven soils that have slopes of more than 2 percent. Erosion is also a hazard on the more sloping Bonneau, Caroline, Norfolk, and Wickham soils. Bonneau, Conetoe, Goldsboro, Norfolk, Rumford, Seabrook, Tarboro, and Wickham soils are subject to wind erosion.

Erosion is damaging for various reasons. The topsoil is washed away, reducing productivity and soil tilth. Costly and potentially harmful herbicides, fertilizers, and lime are removed from the field as well as the valuable topsoil and organic matter. Erosion degrades water quality by increasing the amount of sediment deposited in streams, lakes, and reservoirs. Effectively controlling erosion maintains soil productivity and improves water quality.

Practices that control erosion provide protective surface cover, reduce runoff, and increase infiltration. Maintaining plant cover on the soil for an extended period of time, through the use of winter cover crops, for example, reduces erosion losses to an amount that does not adversely affect soil productivity.

Establishing parallel terraces and contour tillage systems on the sloping Autryville, Caroline, Craven, Norfolk, and Wickham soils is difficult, because of the short, irregular slopes. The large four- to eight-row

equipment presently used by producers presents problems. On these soils, conservation tillage effectively controls erosion; a conservation cropping system that includes substantial plant cover should be used. Grassed waterways, generally planted in tall fescue, provide safe disposal of surface water runoff. Field borders of fescue help filter sediment from runoff water.

A compacted traffic pan has formed between the topsoil and subsoil in several of the soils in Hertford County. Traffic pans are commonly observed in Bonneau, Caroline, Goldsboro, Rumford, and Wickham soils. These pans reduce infiltration, root penetration, and permeability. The hazard of erosion is increased on sloping soils that also have a traffic pan. A conservation tillage system that includes the use of rippers, subsoilers, and chisels effectively reduces pans. The formation of a traffic pan is related to the number of trips across the field and the amount of tillage done during wet periods.

Terraces and diversions reduce erosion by intercepting excess surface runoff and safely routing this water to suitable outlets, grassed waterways, for example. These practices are practical and highly effective on soils that have a uniform slope pattern, some of the Norfolk, Bonneau, Craven, Caroline, and Wickham soils, for example.

Contour tillage is an effective conservation practice on many of the soils in Hertford County. Like terraces and diversions, it is most effective on soils that have uniform slopes, although it can be adapted to a wide range of slope patterns.

Wind erosion is commonly a problem on soils that have a sandy surface layer. Many tons of topsoil are lost from Bonneau, Conetoe, Goldsboro, Norfolk, Rumford, Seabrook, Tarboro, and Wickham soils each year. This windblown material can be carried many miles, generally during March, April, and May. Damage from wind erosion can be greatly reduced through use of a conservation cropping system that includes cover crops and crop residue management. Windbreaks of tall-growing small grain can be used to reduce late wind damage to young row crops. Windbreaks of pine and a shrub understory are effective in large open areas.

Information on the design and applicability of erosion control practices for each kind of soil can be obtained from the local office of the Soil Conservation Service.

Excessive wetness is a problem on approximately 24,000 acres presently used as cropland in Hertford County. Many of the poorly drained and somewhat poorly drained soils, Rains, Lynchburg, Leaf, Lenoir, Roanoke, and Tomotley soils, for example, require extensive drainage to obtain a high level of production. An extensive drainage system includes tile drainage, open ditches, and land smoothing. Land smoothing allows the successful production of crops such as corn, soybeans, and small grain. Peanuts and tobacco can be grown on Goldsboro, Exum, Lynchburg, and Craven soils if an adequate system of surface and subsurface drainage is installed and maintained.

Most of the wet soils respond well to artificial drainage, although the Leaf, Lenoir, and Craven soils, for example, respond more slowly than others. The less responsive soils require an extensive surface drainage system, including open channels and land grading.

Soil tilth is an important factor in crop production. Seed germination and water infiltration are influenced by soil tilth. Soils that have good tilth have a surface layer which is granular and porous.

The surface layer of most of the soils in Hertford County is loamy sand, sandy loam, or fine sandy loam and is low in organic matter. Soils that have a fine textured surface layer of loam or silt loam, Leaf, Lenoir, Roanoke, and Wehadkee soils, for example, are subject to crusting after intense rainfall. Other soils, the more sloping Craven soils, for example, have an eroded surface layer which tends to crust. Adding crop residue, manure, and mulch helps reduce crusting and improve soil structure and tilth.

Fall plowing generally is not a recommended practice on the soils in Hertford County because most of the soils form a hard crust after intense fall rains. This crust slows water infiltration and increases runoff and erosion during the winter. A protective cover of crop residue helps prevent erosion.

The poorly drained and somewhat poorly drained soils, Rains, Lenoir, Leaf, Lynchburg, Roanoke, and Tomotley soils, for example, tend to have poor soil tilth because they stay wet until late in spring. If they are plowed when wet, they become cloddy when dry, and a good seedbed is difficult to prepare.

The soils in Hertford County are not high enough in natural fertility to produce economic returns on crops. They are naturally acid, and lime must be added to make them suitable for most crops. However, extensive use of fertilizer on the better drained soil used for tobacco has resulted in a high level of phosphorus. Many farmers add fertilizer that does not have phosphorus to these soils in an effort to utilize the phosphorus already present.

Lime is perhaps the most important addition to the soil because the acidity level affects the availability of many plant nutrients and influences the activity of beneficial bacteria. Lime provides calcium (Ca) and, if dolomitic lime is used, magnesium (Mg). Lime neutralizes exchangeable aluminum (AL) and thus counteracts the adverse effect aluminum has on many of the important crops grown in the county.

Soils that have a sandy surface layer tend to be low in magnesium as well as calcium, and a soil test is necessary to determine whether calcitic or dolomitic lime should be used. Also, the desired pH level differs according to the soil properties and crop to be grown.

Nitrogen is required for all crops. Application of nitrogen is generally not required for peanuts, clover, some rotation of soybeans, or alfalfa after it has been

established. No soil test is available for predicting nitrogen requirements. Appropriate rates are discussed in the section "Yields Per Acre." Because nitrogen can be readily leached from sandy soils, it is sometimes necessary to apply it on these soils more than once during the growing season.

The need for phosphorus can be predicted from soil tests. It is necessary to determine phosphate requirements for specific crops by sampling each field and obtaining soil test recommendations. In Hertford County it is particularly important to have a soil test of each field to determine phosphate requirements because phosphorus tends to build up in the soil.

The use of herbicides for weed control on cropland is a common practice in Hertford County. Successful use of herbicides reduces the amount of tillage needed. Soil properties such as the content of organic matter and texture of the surface layer affect the rate of herbicide application. Table 15 gives a general range of organic matter content for each soil in the county, and Table 14 gives the surface texture.

In some areas, the content of organic matter for a particular soil is outside the range shown in the table. The level can be higher than the range if the soil has received a high amount of animal or manmade waste. Virgin soils that have been converted to cultivation sometimes have a higher level of organic matter in their surface layer than similar soils that have been cultivated for a long period of time. Conservation tillage can increase the content of organic matter in the surface layer. A low level of organic matter is common in soils where the surface layer has been partly or completely removed by erosion, land smoothing, or other activities. Current soil tests should be used to determine the content of organic matter for a specific soil. On sandy soils that are less than 2 percent organic matter, rapid leaching of herbicides can damage young plants or prevent normal seed germination. The effectiveness of herbicides commonly decreases if the level of organic matter exceeds 6 to 10 percent.

Although the major pasture and hayland grass is tall fescue, other species of grasses, coastal bermuda, common bermuda, and bahiagrass, for example, are better adapted to some of the soils. Producers of livestock should plant the grass that is best adapted to the soil. Planting the adapted grass and using good management techniques, including rotation, proper annual fertilization, weed control, and controlled grazing result in higher returns from pasture and hayland.

The deep, well drained and moderately well drained Norfolk, Craven, Exum, Caroline, and Goldsboro soils are suited to all of the major grasses common to the area. Fescue, fescue and clover, common bermuda, and bahiagrass produce from 6 to 9 animal-unit-months of grazing each year. Coastal bermudagrass produces an average of 10 animal-unit-months.

The deep, sandy Conetoe, Bonneau, Wakulla, and Tarboro soils that are subject to moisture stress and fertilizer leaching are not well suited to fescue. These soils are best suited to such grasses as coastal bermudagrass and common bermudagrass. These grasses produce 5 to 9 animal-unit-months of grazing.

The wetter Bibb, Leaf, Rains, Roanoke, and Wehadkee soils are best suited to fescue or to a mixture of fescue and legume. These soils produce from 5 to 9 animal-unit-months of grazing per year, depending on the management techniques used.

Effective pasture and hayland management includes summer grasses such as bermudagrass and cool season grasses or a grass-legume mixture. If proper fencing for rotation of grazing stock and careful application of fertilizer are used, pasture can be grazed from March through November. Hayland crops of coastal bermudagrass and field gleanings can be used during the winter as livestock feed.

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.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

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

A high level of management includes maintaining proper soil reaction and fertility level as indicated by standard soil tests. A suitable rate of nitrogen application for corn on soils which have a yield potential of 125 to 150 bushels per acre is 140 to 160 pounds per acre. If the yield potential is only 100 bushels per acre a rate of 100 to 120 pounds per acre is feasible. Application of nitrogen in excess of the potential yield is generally a sound practice. Excess fertilizer that cannot be used by a crop results in pollution as well as unnecessary expense. If corn or cotton is planted after soybeans or peanuts are harvested, the rate of nitrogen application can be reduced 20 to 30 pounds per acre.

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the crops grown, that good quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

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

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the North Carolina Agricultural Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor does it consider possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland and for engineering purposes.

In the capability system, soils are generally grouped at two levels: capability class and subclass. These levels are defined in the following paragraphs.

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 miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w,* or *s,* 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); and *s* shows that the soil is limited mainly because it is shallow, droughty, or stony.

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* or *s* because the soils in class V are subject to little or no erosion. 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 shown in table 6. The capability classification of each map unit is given in the section "Detailed Soil Map Units."

Woodland Management and Productivity

Edwin J. Young, state staff forester, Soil Conservation Service, Raleigh, N.C., helped prepare this selection.

Forests are of economic, recreational, and environmental importance in Hertford County. They provide wood products, scenic beauty, wildlife habitat, outdoor recreation, and protection of water quality. However, the clearing of land for farming, urban development, and other uses has significantly reduced the acreage of commercial forest.

Commercial forest land is land capable of producing crops of wood for industrial use. In 1974, commercial forests covered 53 percent of the land areas, or 145,722 acres (*5*). Farmers owned 77,090 acres of forestland, corporate and individual private landowners, 37,135 acres; forest product industries, 31,325 acres; county and municipal governments, 92 acres; and state government, 80 acres.

Loblolly pine is an important commerical timber species in Hertford County because it grows fast, is adapted to the soil and climate, has a high market value, and is easy to establish and manage (fig. 3). If a site is suited to pine, foresters encourage landowners to plant pine instead of hardwoods. Pine can be produced rapidly and in greater volume than hardwoods. Unless vigorous methods of hardwood control, burning and mechanical site preparation, for example, are applied when reestablishing pine after harvest cutting, hardwoods tend to eventually replace pines.

Loblolly pine grows on a wide variety of soils. It growns best on adequately drained soils that have a thick surface layer and a firm subsoil. However, good yields can also be obtained on poorly drained soils if

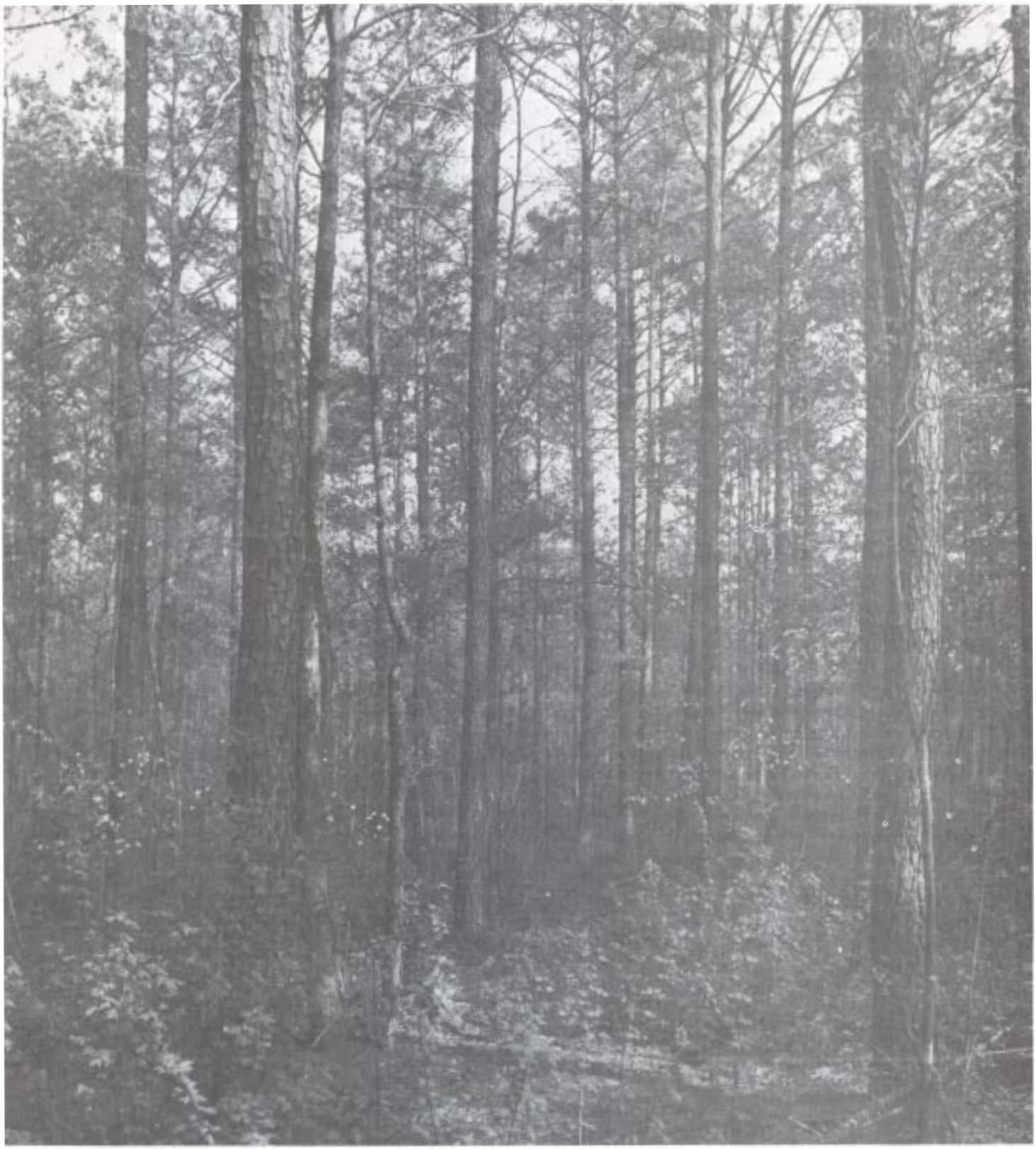


Figure 3.—Loblolly pine is an important species on commerical forest land. This forest is in an area of Lenoir loam.

bedding elevates seedings above standing water. The deep, excessively drained sands have relatively low site quality.

Four forest types have been identified in the county (*5*):

Loblolly-shortleaf (41,266 acres). Loblolly pine and shortleaf pine make up more than 50 percent of the stand. Red and white oaks, gum, hickory, and yellow-poplar make up the rest. The understory commonly consists of hardwood seedlings and saplings, which are more tolerant of shade than pine. In a shaded understory, hardwoods compete so strongly with pines for light and moisture that few pine seedlings can survive. If a mature stand of pine is cut, the dense understory of young hardwoods becomes dominant.

Oak-pine (32,699 acres). Hardwoods make up 50 percent or more of the stand. Pines make up 25 to 50 percent, in association with upland oaks, gum, hickory, and yellow-poplar. If the forest is left undisturbed, it tends to become predominantly oak and other upland hardwoods. The understory commonly consists of hardwood seedlings and saplings, which are more tolerant of shade than pine. In a shaded understory, hardwoods compete so strongly with pines for light and moisture that few pine seedlings can survive. If a mature stand of pine is cut, the dense understory of young hardwoods becomes dominant.

Oak-hickory (44,053 acres). Upland oaks and hickory make up more than 50 percent of the stocking. Common associates include elm, maple, and yellow-poplar.

Oak-gum cypress (27,704 acres). This forest type is divided into two broad species associations, tupelo-cypress swamps and mixed bottomland hardwoods. Most sites are characterized by an abundant supply of water and include both alluvial and residual soils. Deep swamps are dominated by water tupelo and baldcypress; some red maple, swamp cottonwood, and green ash and many understory species are included.

Swamp tupelo grows on soils that have a seasonal high water table. Other species suited to wet soils are red maple, sweetbay, redbay, and Carolina ash. Water tupelo, baldcypress, and swamp tupelo grow well on saturated soils and soils that are subject to flooding. The species composition of mixed bottomland hardwoods depends ultimately on the degree and duration of flooding and the seasonal high water table.

Table 7 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination (woodland suitability) symbol for each soil. Soils assigned the same ordination symbol require the same general 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 *w* indicates excessive water in or on the soil; *s*, sandy texture; and *r*, steep slopes. The letter *o* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: w, s, and r.

In table 7, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

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

The *potential productivity* of merchantable or *common 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. It was calculated at 35 years for American sycamore and 50 years for all other species. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown 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 suited to the soils and to commercial wood production.

Recreation

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

In table 8, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

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

Camp areas require site preparation such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface absorbs rainfall readily but remains firm and is not dusty when dry. Strong slopes can greatly increase the cost of constructing campsites.

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

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is firm after rains and is not dusty when dry.

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

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

John P. Edwards, biologist, Soil Conservation Service, Raleigh, N.C., helped prepare this selection.

The relationship of wildlife to soils is mainly an indirect one, through plants. Wildlife species are associated with a type of plant community, which, in turn, is directly related to the kind of soil. Soil, water, and plants can be managed to produce suitable habitat for wildlife populations.

The wildlife habitat in Hertford County is highly varied mainly because of the different types of landforms and land uses. The soils support a wide variety of plants that provide food, cover, and protection for wildlife. Upland species, for example, squirrel, rabbit, white-tailed deer, quail, mourning dove, fox, and songbirds, are abundant throughout the county. Furbearers, for example, raccoon, muskrat, mink, and opossum, are also abundant. Waterfowl, for example, mallard, black duck, and wood duck, frequent the Chowan, Merrin, and Wiccacon Rivers and their tributaries.

Some areas of the county are characterized by many small farms; areas of woodland and cropland are relatively small and are intermixed. The edges of fields provide desirable habitat. In addition, some areas have numerous ditches bordered by shrubs and trees, and some areas have abandoned fields. These areas provide excellent habitat for all wildlife and are particularly abundant near the town of Ahoskie. Leaf, Lenoir, and Craven soils are dominant in these areas.

A plan for the management of wildlife habitat is needed in areas where woodland is being converted to cropland. Field borders, minimum tillage, crop residue, field windbreaks, and maintenance of hardwood corridors can help maintain the existing wildlife habitat. Rains and Roanoke soils are dominant in these areas.

In one section of the county, timber management is carried out on a large scale. This area provides excellent wildlife habitat. The reforestation of loblolly pine is the dominant element in woodland management. In most of this area, however, hardwood shelterbelts or corridors are maintained along natural drainage patterns. Leaf and Lenoir soils are dominant in this area.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect

the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 9, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

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

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

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, and oats.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, orchardgrass, lovegrass, bromegrass, and clover.

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

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

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

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, and slope. Examples of wetland plants are smartweed, wild millet, wildrice, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and beaver ponds.

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

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines (fig. 4). These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include bobwhite quail, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, and deer.

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

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the

Figure 4.—Adequate food and cover are necessary to maintain a wildlife population. This area of wildlife habitat is on Roanoke loam.

most limiting features are identified. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals and the mineralogy of the sand and silt fractions. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey can be used to make additional interpretations.

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

Building Site Development

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

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

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

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

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, and the available water capacity in the upper 40 inches affect plant growth. Flooding, wetness, slope, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 11 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the

limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

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

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

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

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

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

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

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

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

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

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

Soil texture, wetness, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

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

Construction Materials

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

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low

embankments, generally less than 6 feet high and less exacting in design than higher embankments.

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

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

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

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

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

A soil rated as a probable source has a layer of clean sand that is up to 12 percent silty fines. This material must be at least 3 feet thick. All other soils are rated as an improbable source.

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

Plant growth is affected by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They have slopes of less than 8 percent, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, or soils that have slopes of 8 to 12 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have slopes of more than 12 percent, or have a seasonal water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

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

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

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil. Excessive slope can affect the storage capacity of the reservoir area.

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

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of organic matter. A high water table affects the amount of usable material. It also affects trafficability.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; and subsidence of organic layers. Excavating and grading and the stability of ditchbanks are affected by slope and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity. Availability of drainage outlets is not considered in the ratings.

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

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope and wetness affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind or water erosion, and slow or restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Wetness and slope affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, and slow or restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

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

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

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

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

Engineering Index Properties

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

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

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (*1*).

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

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

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

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

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

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

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earth-moving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

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

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

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

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value the more susceptible the soil is to sheet and rill erosion by water.

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

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

1. Sands, coarse sands, fine sands, and very fine sands. These soils are generally not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.

2. Loamy sands, loamy fine sands, and loamy very fine sands. These soils are very highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

3. Sandy loams, coarse sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

4L. Calcareous loamy soils that are less than 35 percent clay and more than 5 percent finely divided calcium carbonate. These soils are erodible. Crops can be grown if intensive measures to control wind erosion are used.

4. Clays, silty clays, clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control wind erosion are used.

5. Loamy soils that are less than 18 percent clay and less than 5 percent finely divided calcium carbonate and sandy clay loams and sandy clays that are less than 5 percent finely divided calcium carbonate. These soils are slightly erodible. Crops can be grown if measures to control wind erosion are used.

6. Loamy soils that are 18 to 35 percent clay and less than 5 percent finely divided calcium carbonate, except silty clay loams. These soils are very slightly erodible. Crops can easily be grown.

7. Silty clay loams that are less than 35 percent clay and less than 5 percent finely divided calcium carbonate. These soils are very slightly erodible. Crops can easily be grown.

8. Stony or gravelly soils and other soils not subject to wind erosion.

Organic matter is the plant and animal residue in the soil at various stages of decomposition.

In table 15, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

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

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

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

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

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

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a 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, the temporary inundation of an area, is caused by overflowing streams or by runoff from adjacent slopes. Water standing for short periods after rainfall or snowmelt is not considered flooding, nor is water in swamps and marshes.

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

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, common, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *common* that it is likely under normal conditions; *occasional* that it occurs, on the average, no more than once in 2 years; and *frequent* that it occurs, on the average, 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.

The information is based on evidence in the soil profile, namely thin strata of sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

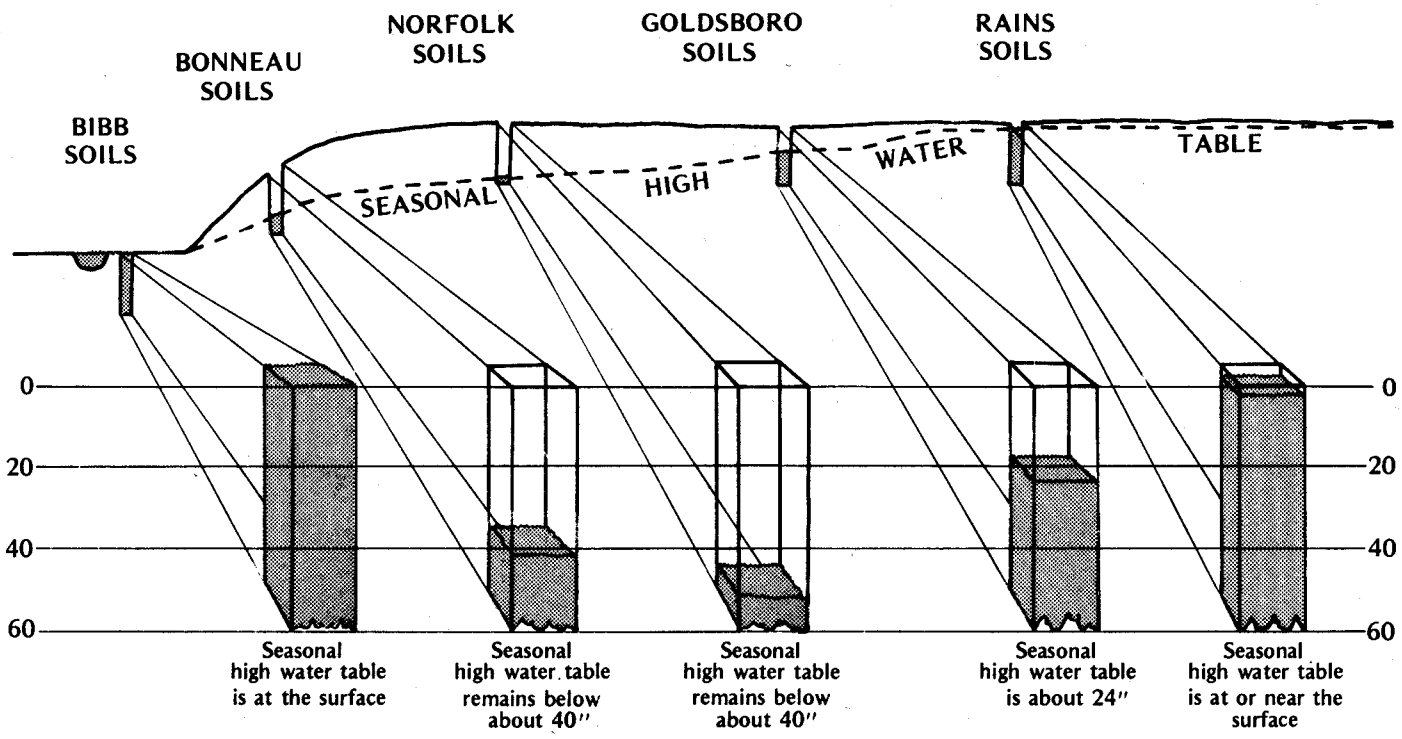


Figure 5.—A representative landscape showing the location of some important soils and the depth to the seasonal high water table.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years (fig. 5). The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 16 are the depth to the seasonal high water table; the kind of water table—that is, perched or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 16.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Only saturated zones within a depth of about 6 feet are indicated. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

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

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

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

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*4*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 17 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Ultisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Udults (*Ud*, meaning humid climate, plus *ult*, from Ultisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hapludults (*Hapl*, meaning minimal horizonation, plus *udult*, the suborder of the Ultisols that formed in a humid climate).

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

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, thermic Typic Hapludults.

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

Soil Series and Their Morphology

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

Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described (fig. 6). The detailed description of each soil horizon follows standards in the Soil Survey Manual (*3*). Many of the technical terms used in the descriptions are defined in Soil Taxonomy (*4*). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

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

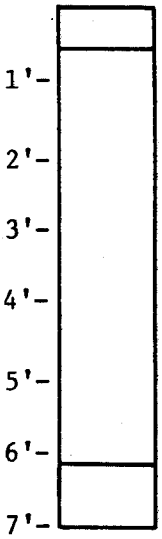
Altavista Series

The Altavista series consists of moderately well drained soils on stream terraces. These soils formed in fluvial material. Permeability is moderate. The slope ranges from 0 to 2 percent.

Typical pedon of Altavista fine sandy loam, 0 to 2 percent slopes, 4 miles southeast of Como, 0.5 mile east of State Road 1308 on State Road 1306, and 60 feet north of the road:

Ap—0 to 10 inches; brown (10YR 4/3) fine sandy loam; weak medium granular structure; very friable; many

Profile of Dorovan Series



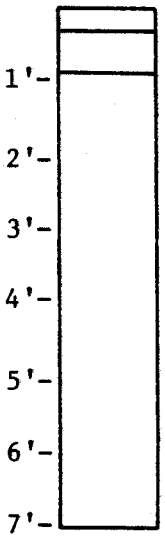
0-6" black mucky peat

6-70" black muck

70-85" dark grayish brown fine sand

Main use: Woodland
Limitation: Wetness and flooding

Profile of Leaf Series



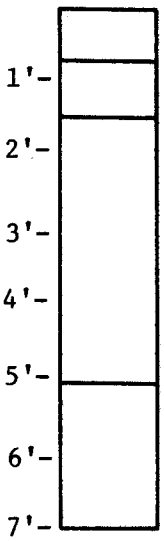
0-4" very dark grayish brown loam

4-10" grayish brown clay

10-62" gray clay

Main use: Woodland
Limitations: Wetness, very slow permeability, and shrink-swell potential

Profile of Norfolk Series



0-9" dark grayish brown loamy fine sand

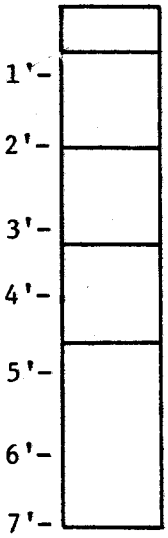
9-17" light yellowish brown loamy fine sand

17-61" yellowish brown sandy clay loam

61-68" light gray sandy clay loam

Main use: Corn, soybeans, peanuts, tobacco, and cotton
Limitations: None

Profile of Wakulla Series



0-8" dark grayish brown sand

8-26" yellow sand

26-39" yellowish brown loamy sand

39-55" mottled yellowish brown and gray sand

55-72" brown coarse sand

Main use: Peanuts
Limitations: Leaching of plant nutrients, wind erosion, and droughtiness

Figure 6.—Some soil properties, major uses, and limitations of four contrasting soils in Hertford County.

fine and medium roots; medium acid; abrupt smooth boundary.

Bt1—10 to 22 inches; light yellowish brown (2.5Y 6/4) sandy clay loam; few fine faint brownish yellow (10YR 6/8) mottles; weak medium subangular blocky structure; friable, slightly sticky; few fine roots; thin patchy clay films on faces of peds; medium acid; clear wavy boundary.

Bt2—22 to 29 inches; light yellowish brown (2.5Y 6/4) sandy clay loam; common medium distinct brownish yellow (10YR 6/8) and light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; thin patchy clay films on faces of peds; few fine roots; few fine flakes of mica; strongly acid; clear wavy boundary.

Btg—29 to 38 inches; light gray (10YR 7/2) sandy clay loam; common medium prominent brownish yellow (10YR 6/8) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; thin patchy clay films on faces of peds; few fine flakes of mica; strongly acid; gradual wavy boundary.

BCg—38 to 50 inches; light gray (10YR 7/2) sandy loam; pockets of sandy clay loam; common medium prominent brownish yellow (10YR 6/8) mottles; weak fine subangular blocky structure; friable, slightly sticky; few fine flakes of mica; strongly acid; gradual wavy boundary.

Cg—50 to 60 inches; light gray (10YR 7/1) coarse sand; some lenses of sandy loam; common distinct yellow (10YR 8/8) stains; massive; friable; few fine flakes of mica; strongly acid.

Altavista soils have a loamy Bt horizon that ranges from 15 to 40 inches thick. These soils are very strongly acid to medium acid, except where lime has been added.

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

The BA horizon, where present, has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 to 6. It is fine sandy loam or sandy loam. The Bt horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 4 to 8. Gray mottles are within 30 inches of the surface, or the lower Bt horizon has a gray matrix and mottles of high chroma. The Bt horizon is clay loam, sandy clay loam, or loam. The BC horizon is similar in color to the Bt horizon, or it has a gray matrix, or it is mottled. It is sandy loam or loamy sand.

The C horizon is coarse sand, sand, or loamy sand.

Autryville Series

The Autryville series consists of well drained soils on Coastal Plain uplands. Permeability is moderately rapid in the upper part of the subsoil and moderate in the lower part. The slope ranges from 0 to 5 percent.

Typical pedon of Autryville loamy sand, 0 to 5 percent slopes, 3 miles west of Coma, 0.1 mile south of the intersection of State Road 1310 and State Road 1315, 0.4 mile east on a farm road, and 50 feet north of the road:

Ap—0 to 9 inches; brown (10YR 5/3) loamy sand; weak fine granular structure parting to single grained; very friable to loose; many fine roots; medium acid; abrupt smooth boundary.

E—9 to 23 inches; light yellowish brown (2.5Y 6/4) loamy sand; weak fine granular structure; very friable; many fine roots; strongly acid; gradual wavy boundary.

Bt—23 to 40 inches; strong brown (7.5YR 5/6) sandy loam; some yellow (10YR 7/6) lenses in the upper part; weak medium subangular blocky structure; friable; few fine roots; very strongly acid; gradual wavy boundary.

E'—40 to 55 inches; yellowish brown (10YR 5/6) loamy sand; weak fine granular structure parting to single grained; very friable to loose; very strongly acid; clear irregular boundary.

B't—55 to 80 inches; yellowish brown (10YR 5/6) sandy loam; lenses of sandy clay loam; common medium distinct light gray (10YR 7/1) and yellowish red (5YR 5/6) mottles; weak fine subangular blocky structure; friable; clay material is slightly sticky and slightly plastic; very strongly acid.

Autryville soils have bisequal sandy and loamy horizons more than 60 inches thick. These soils are very strongly acid or strongly acid, except where lime has been added.

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

The E horizon has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 3 or 4.

The Bt horizon has hue of 7.5 YR or 10YR, value of 5 or 6, and chroma of 4 to 8. It is sandy clay loam or sandy loam.

The E' horizon has hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 2 to 8. It is loamy sand or sand.

The B't horizon has hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 2 to 8. It is sandy loam or sandy clay loam.

Bibb Series

The Bibb series consists of poorly drained soils on flood plains. These soils formed in recent alluvium. Permeability is moderate. The slope is less than 2 percent.

Typical pedon of Bibb loam, 1 mile west of Murfreesboro on State Road 1157, 0.4 mile east of North Hampton and the Hertford County line:

A1—0 to 8 inches; very dark grayish brown (10YR 3/2) loam; weak fine granular structure; friable; many fine roots; strongly acid; abrupt wavy boundary.
Ag—8 to 28 inches; dark grayish brown (10YR 4/2) sandy loam; few fine prominent strong brown (7.5YR 5/8) mottles; weak fine granular structure; friable; few fine roots; strongly acid; clear wavy boundary.
Cgl—28 to 33 inches; gray (10YR 6/1) sand; massive; loose; few fine roots; strongly acid; clear wavy boundary.
Cg2—33 to 61 inches; yellow (10YR 7/8) loamy sand; coarse sand and silt stratified with decomposed organic matter; massive; loose; few fine roots; strongly acid.

Bibb soils have a loamy horizon in the 10- to 40-inch control section. These soils are very strongly acid or strongly acid, except where lime has been added.

The A1 horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. The A2 horizon, if present, has hue of 10YR, value of 3 to 7, and chroma of 0 to 2. If the A horizon is black or very dark gray, it is less than 10 inches thick.

The C horizon has hue of 10YR to 2.5Y, value of 3 to 7, and chroma of 0 to 8. Some pedons have few to many mottles of red, yellow, and brown. The 10- to 40-inch control section is sandy loam, loam, or fine sandy loam, or it is stratified.

Bonneau Series

The Bonneau series consists of well drained or moderately well drained soils on Coastal Plain uplands. Permeability is moderate. The slope ranges from 0 to 12 percent.

Typical pedon of Bonneau loamy sand, 0 to 6 percent slopes, 3 miles west of Como, 0.25 mile south of State Road 1315 on State Road 1310, and 100 feet west of the road:

Ap—0 to 9 inches; grayish brown (10YR 5/2) loamy sand; weak medium granular structure parting to single grained; very friable to loose; many fine roots; slightly acid; abrupt smooth boundary.
E—9 to 24 inches; light yellowish brown (2.5Y 6/4) loamy sand; weak medium granular structure parting to single grained; very friable to loose; few fine roots; strongly acid; gradual wavy boundary.
Bt1—24 to 35 inches; yellowish brown (10YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable; few fine roots; strongly acid; gradual wavy boundary.
Bt2—35 to 49 inches; brownish yellow (10YR 6/8) sandy clay loam; thin lenses of sandy loam, few medium distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable, slightly sticky; very strongly acid; gradual wavy boundary.
Bt3—49 to 63 inches; brownish yellow (10YR 6/8) sandy clay loam; common fine distinct light red (2.5YR 6/8) and common medium prominent light gray (10YR 7/1) mottles; weak medium subangular blocky structure; friable, slightly sticky; very strongly acid.

Bonneau soils have a loamy Bt horizon that ranges from 30 to more than 60 inches thick. These soils are very strongly acid or strongly acid, except where lime has been added.

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

The E horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 to 6.

The BE horizon, where present, has hue of 10YR, value of 5 or 6, and chroma of 4 to 8. It is sandy loam. The Bt horizon has hue of 7.5YR to 10YR, value of 5 or 6, and chroma of 4 to 8. Mottles that have chroma of 2 are within a depth of 38 to 52 inches. The Bt horizon is sandy clay loam or sandy loam.

Caroline Series

The Caroline series consists of well drained soils on Coastal Plain uplands. Permeability is moderately slow to slow. The slope ranges from 0 to 6 percent.

Typical pedon of Caroline fine sandy loam, 0 to 2 percent slopes, 3.5 miles southwest of St. Johns 1.1 miles east of State Road 1118 on State Road 1123 and 70 feet south of the road:

Ap—0 to 8 inches; yellowish brown (10YR 5/6) fine sandy loam; weak fine granular structure; friable; many fine roots; medium acid; clear smooth boundary.
BA—8 to 11 inches; yellowish brown (10YR 5/6) clay loam; weak medium subangular blocky structure; friable, slightly sticky; many fine roots; strongly acid; abrupt wavy boundary.
Bt1—11 to 16 inches; yellowish brown (10YR 5/6) clay loam; moderate medium subangular blocky structure; friable, sticky and plastic; few thin patchy clay films on faces of peds; very strongly acid; clear smooth boundary.
Bt2—16 to 28 inches; strong brown (7.5YR 5/6) clay loam; common medium prominent yellowish red (5YR 5/8) mottles; moderate fine and medium subangular blocky structure; firm, sticky and plastic; few thin patchy clay films on faces of peds; strongly acid; gradual smooth boundary.
Bt3— 28 to 40 inches; strong brown (7.5YR 5/8) clay loam; common medium distinct yellowish red (5YR 5/6), brownish yellow (10YR 6/6), and red (2.5YR 5/6) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; common flakes of mica; very strongly acid; gradual wavy boundary.

Bt4—40 to 48 inches; yellowish red (5YR 5/8) clay loam; few fine prominent reddish yellow (7.5YR 6/8) mottles; weak medium subangular blocky structure; firm, sticky and plastic; common flakes of mica; very strongly acid; gradual smooth boundary.
BC—48 to 62 inches; mottled yellowish red (5YR 5/8) and strong brown (7.5YR 5/8) clay loam; weak medium subangular blocky structure; firm to friable, sticky and slightly plastic; common fine flakes of mica; very strongly acid.

Caroline soils have a clayey Bt horizon that ranges from 37 to 90 inches in thickness. These soils are extremely acid to strongly acid, except for the surface layer where lime has been added.

The Ap horizon has hue of 7.5YR to 10YR, value of 4 to 6, and chroma of 4 to 6.

The BA horizon has hue of 7.5YR to 10YR, value or 4 or 5, and chroma of 6 to 8. It is clay loam or sandy clay loam. The Bt horizon has hue of 5YR to 10YR, value of 4 or 5, and chroma of 6 to 8. It is clay, clay loam, or sandy clay. The BC and C horizons are mottled in shades of red, yellow, brown, and gray. They are clay loam or sandy clay loam.

Conetoe Series

The Conetoe series consists of well drained soils on stream terraces. Permeability is moderately rapid. These soils formed in fluvial material. The slope ranges from 0 to 5 percent.

Typical pedon of Conetoe loamy sand, 0 to 5 percent slopes, 4.8 miles south of Cofield on North Carolina Highway 45, 0.7 mile east on State Road 1443, 0.2 mile north on a farm road, and 50 feet east of the road:

Ap—0 to 9 inches; grayish brown (10YR 5/2) loamy sand; weak medium granular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.
E—9 to 24 inches; light yellowish brown (2.5Y 6/4) loamy sand; weak fine granular structure; very friable; many fine roots; strongly acid; clear wavy boundary.
Bt—24 to 35 inches; strong brown (7.5YR 5/8) sandy loam; weak fine subangular blocky structure; very friable; few fine roots; few flakes of mica; very strongly acid; gradual wavy boundary.
BC—35 to 39 inches; brownish yellow (10YR 6/8) sandy loam; weak fine subangular blocky structure; very friable; common flakes of mica; very strongly acid; gradual wavy boundary.
C—39 to 68 inches; reddish yellow (7.5YR 6/8) loamy sand; weak medium granular structure parting to single grained; very friable to loose; common flakes of mica; very strongly acid.

Conetoe soils have a loamy Bt horizon 10 to 30 inches thick. These soils range from very strongly acid to medium acid, except where lime has been added.

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

The E horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 4 to 6.

The Bt horizon has hue of 7.5 or 10YR, value of 5 to 7, and chroma of 6 to 8. It is typically sandy loam. The BC horizon is similar in color to the Bt horizon. It is sandy loam or loamy sand.

The C horizon has hue of 7.5YR to 10YR, value of 6 or 7, and chroma of 3 to 8. It is loamy sand or sand.

Craven Series

The Craven series consists of moderately well drained soils on Coastal Plain uplands. Permeability is slow. The slope ranges from 0 to 12 percent.

Typical pedon of Craven fine sandy loam, 0 to 1 percent slopes, 300 feet northwest of intersection of North Carolina Highway 561 and North Carolina Highway 35 and 75 feet north of North Carolina 35:

Ap—0 to 7 inches; light yellowish brown (2.5Y 6/4) fine sandy loam; weak fine granular structure; friable; common fine roots; strongly acid; clear smooth boundary.
Bt1—7 to 20 inches; brownish yellow (10YR 6/6) silty clay; moderate medium subangular blocky structure; firm, slightly sticky and slightly plastic; few fine roots; common fine and medium pores; few patchy clay films on faces of peds; strongly acid; clear wavy boundary.
Bt2—20 to 36 inches; yellowish brown (10YR 5/6) clay; common medium distinct strong brown (7.5YR 5/6), light gray (10YR 7/1), and red (2.5YR 5/8) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; few fine and medium pores; thin continuous clay films on faces of peds; very strongly acid; gradual wavy boundary.
Btg—36 to 52 inches; mottled light gray (10YR 7/2), strong brown (7.5YR 5/6), and brownish yellow (10YR 6/6) clay; weak medium subangular blocky structure; firm, sticky and plastic; few fine pores; thin continuous clay films on faces of peds; few fine flakes of mica; very strongly acid; gradual wavy boundary.
Cg—52 to 62 inches; mottled light gray (10YR 7/1) and brownish yellow (10YR 6/6) clay loam; massive; firm, very sticky and very plastic; few fine flakes of mica; very strongly acid.

Craven soils have a clayey Bt horizon that is 20 to 50 inches thick. These soils are very strongly acid or strongly acid, except where lime has been added.

The A horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 2 to 4.

The BA horizon, where present, has hue of 10YR, value of 5 or 6, and chroma of 4 to 6. It is loam or clay loam. The upper part of the Bt horizon has hue of 10YR, value of 5 to 7, and chroma of 4 to 8. The lower part of the Bt horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 to 4. In many pedons there are few to many mottles of gray, strong brown, yellowish red, brownish yellow, and red in the lower part of the Bt horizon. The Bt horizon is dominantly clay, although the range includes clay loam and silty clay.

The C horizon is gray and has mottles in shades of yellow, brown, gray, and red. It is sandy loam, loamy sand, sandy clay loam, clay loam, or clay.

Dorovan Series

The Dorovan series consists of very poorly drained soils on flood plains. Permeability is moderate. The slope is less than 1 percent.

Typical pedon of Dorovan muck, 0.1 mile south of the Meherrin River ferry crossing and 50 feet west of State Road 1175:

Oe—0 to 6 inches; black (10YR 2/1) mucky peat consisting of partially decomposed moss, leaves, roots, and twigs mixed with a small amount of well decomposed organic matter; 50 percent fiber after rubbing; nonsticky; very strongly acid; gradual wavy boundary.

Oa1—6 to 25 inches; black (10YR 2/1) muck that remains black (10YR 2/1) when rubbed and pressed; about 30 percent fiber unrubbed, less than 5 percent rubbed; fibers that remain after rubbing are partly decomposed fragments of wood less than 2 millimeters in diameter; massive; nonsticky; common roots and partly decomposed tree limbs; very strongly acid; gradual wavy boundary.

Oa2—25 to 70 inches; black (10YR 2/1) muck that remains black (10YR 2/1) when rubbed and pressed; about 30 percent fiber unrubbed, less than 5 percent rubbed; fibers that remain after rubbing are partly decomposed fragments of wood less than 2 millimeters in diameter; massive, slightly sticky; few roots; decomposed tree limbs and twigs; few logs; very strongly acid; gradual wavy boundary.

Cg—70 to 85 inches; dark grayish brown (10YR 4/2) fine sand; single grained; nonsticky; few small partly decayed fragments of wood; very strongly acid.

The organic material is 51 to more than 80 inches thick. The organic layers are very strongly acid or strongly acid. Logs and wood fragments make up 0 to 5 percent of the organic layers. The organic layers are underlain by sandy and loamy mineral material.

The Oe horizon, where present, has hue of 10YR, value of 2 to 4, and chroma of 1 to 3. It is muck or mucky peat. It is 40 to 90 percent fiber unrubbed and 20 to 60 percent rubbed.

The Oa1 horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. It is muck. Fiber content is 15 to 40 percent unrubbed and 2 to 6 percent rubbed. Mineral content ranges from 10 to 30 percent. A root mat and layer of fibric litter 6 to 12 inches thick commonly covers the Oal horizon.

The layers below the Oa1 horizon have hue of 10YR, value of 2 or 3, and chroma of 0 to 2, or they are neutral. They are muck. Fiber content is 10 to 25 percent unrubbed and commonly 5 percent or less rubbed. Mineral content ranges from 5 to 20 percent.

The C horizon, if present, has hue of 10YR, value of 3 or 4, and chroma of 1 to 2. It is stratified sandy or loamy fluvial deposits.

Exum Series

The Exum series consists of moderately well drained soils on Coastal Plain uplands. Permeability is moderate. The slope is 0 to 2 percent.

Typical pedon of Exum very fine sandy loam, 0 to 2 percent slopes, 2 miles south of Ahoskie on State Road 1101, 0.75 mile south of intersection of State Road 1101 with State Road 1100, and 700 feet east of the road:

Ap—0 to 8 inches; grayish brown (2.5Y 5/2) very fine sandy loam; weak medium granular structure; very friable; many fine and medium roots; strongly acid; abrupt smooth boundary.

BA—8 to 11 inches; light yellowish brown (2.5Y 6/4) loam; weak medium granular parting to weak fine subangular blocky structure; very friable; many fine and medium roots; strongly acid; clear smooth boundary.

Bt1—11 to 18 inches; light yellowish brown (2.5Y 6/4) silty clay loam; moderate fine subangular blocky structure; friable to firm, sticky and slightly plastic; few fine roots; very strongly acid; gradual wavy boundary.

Bt2—18 to 40 inches; light yellowish brown (2.5Y 6/4) silty clay loam; many medium distinct light gray (10YR 7/2) and few fine prominent reddish yellow (7.5YR 6/8) mottles; moderate fine subangular blocky structure; friable to firm, sticky and slightly plastic; few fine roots; many fine pores; thin patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt3—40 to 62 inches; light yellowish brown (2.5Y 6/4) silty clay; many medium prominent light gray (10YR 7/2) and reddish yellow (7.5YR 6/8) mottles; strong medium subangular blocky structure; friable to firm, sticky and plastic; many fine pores; thin patchy clay films on faces of peds; very strongly acid.

Exum soils have a loamy and silty Bt horizon that ranges from 40 to more than 60 inches thick. These soils are very strongly acid or strongly acid, except where lime has been added.

The Ap or A horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 to 3.

The BA horizon, where present, has hue of 10YR or 2.5Y, value of 5 to 6, and chroma of 3 to 8. The Bt horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 3 to 8. Gray mottles are in the lower part of the Bt horizon, within 30 inches of the surface. In some pedons, the Bt horizon is mottled in shades of brown, yellow, and gray. The Bt horizon is loam, clay loam, silty clay, or silty clay loam. The BC horizon, where present, is similar in color and texture to the Bt horizon.

Goldsboro Series

The Goldsboro series consists of moderately well drained soils on Coastal Plain uplands. Permeability is moderate. The slope ranges from 0 to 2 percent.

Typical pedon of Goldsboro fine sandy loam, 0 to 2 percent slopes, 2.9 miles west of Britts Store on State Road 1310, 200 feet south of State Road 1314, and 150 feet east of State Road 1310:

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; very friable; many fine and medium roots; medium acid; abrupt smooth boundary.

BA—7 to 10 inches; light yellowish brown (2.5Y 6/4) sandy loam; weak fine subangular blocky structure; friable; few fine roots; very strongly acid; clear wavy boundary.

Bt1—10 to 26 inches; yellowish brown (10YR 5/6) sandy clay loam; weak fine and medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; very strongly acid; clear smooth boundary.

Bt2—26 to 45 inches; brownish yellow (10YR 6/6) sandy clay loam; common medium distinct light gray (10YR 7/2) and strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; very strongly acid; gradual smooth boundary.

Btg—45 to 62 inches; mottled gray (10YR 6/1), pale brown (10YR 6/3), strong brown (7.5YR 5/8), and red (2.5YR 4/8) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; very strongly acid.

Goldsboro soils have a loamy Bt horizon that ranges from 40 to more than 60 inches in thickness. These soils are very strongly acid, except where lime has been added.

The A or Ap horizon has hue of 10YR, value of 3 to 6, chroma of 1 or 2.

The BA horizon, where present, has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 to 6. It is sandy loam or fine sandy loam. The upper part of the Bt horizon has hue of 7.5YR to 2.5Y, value of 5 or 6, and chroma of 4 to 8. The lower part of the Bt horizon has hue similar to the upper part, value of 3 to 8, and chroma of 1 to 8. Gray mottles are within 30 inches of the surface. The BC horizon, where present, has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. It is sandy loam or loam.

Leaf Series

The Leaf series consists of poorly drained soils on Coastal Plain uplands. Permeability is very slow. The slope is less than 1 percent.

Typical pedon of Leaf loam, 0.3 mile south of Earleys on State Road 1106, 1.3 miles southwest on private road, 0.15 mile south, and 100 feet east:

A—0 to 4 inches; very dark grayish brown (10YR 3/2) loam; weak fine granular structure; friable; many fine roots; strongly acid; abrupt smooth boundary.

Btg1—4 to 10 inches; grayish brown (2.5Y 5/2) clay; common medium distinct brownish yellow (10YR 6/8) mottles; weak fine subangular blocky structure; firm, sticky and plastic; many fine roots; strongly acid; abrupt smooth boundary.

Btg2—10 to 36 inches; gray (10YR 5/1) clay; common medium distinct brownish yellow (10YR 6/8) mottles; moderate medium subangular blocky structure; very firm, sticky and plastic; few fine roots; continuous clay films on faces of peds; very strongly acid; gradual smooth boundary.

Btg3—36 to 62 inches; gray (10YR 5/1) clay; common medium distinct strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; very firm, sticky and plastic; patchy clay films on faces of some peds; few flakes of mica; few sand grains; very strongly acid.

Leaf soils have a clayey Bt horizon 30 to more than 60 inches thick. These soils are very strongly acid or strongly acid, except where lime has been added.

The A, or Ap, horizon has hue of 10YR or 2.5Y, value of 3 or 4, and chroma of 1 or 2.

The E horizon, where present, has hue of 10YR, value of 5 or 6, and chroma of 1 or 2.

The Bt horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2. It is mottled in shades of red, yellow, or brown. The Bt horizon is silty clay loam, clay, or silty clay.

Lenoir Series

The Lenoir series consists of somewhat poorly drained soils on Coastal Plain uplands. Permeability is slow. The slope is less than 1 percent.

Typical pedon of Lenoir loam, 1 mile west of Piland's Cross Roads on State Road 1445, 200 feet north on a forest road, and 40 feet east of the road:

Ap—0 to 3 inches; grayish brown (10YR 5/2) loam; few fine prominent yellowish brown (10YR 5/6) mottles; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; clear smooth boundary.

BA—3 to 6 inches; pale brown (10YR 6/3) loam; few medium distinct light brownish gray (10YR 6/2), light gray (10YR 7/1), and yellowish brown (10YR 5/6) mottles; weak subangular blocky structure; friable; few medium roots; very strongly acid; gradual wavy boundary.

Bt—6 to 19 inches; light yellowish brown (2.5Y 6/4) silty clay; many medium distinct light brownish gray (2.5Y 6/2) and yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few fine roots; few medium pores; very strongly acid; gradual wavy boundary.

Btg1—19 to 35 inches; gray (10YR 6/1) silty clay; many medium distinct reddish yellow (7.5YR 6/8) and yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; thin patchy clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg2—35 to 55 inches; light olive gray (5Y 6/2) clay; many medium distinct gray (5Y 6/1) and reddish yellow (7.5YR 6/8) mottles; weak medium subangular blocky structure; firm, sticky and plastic; very strongly acid; gradual wavy boundary.

BC—55 to 65 inches; gray (5Y 6/1) clay loam; many medium prominent reddish yellow (7.5YR 6/8) mottles; weak medium subangular blocky structure; friable to firm, sticky and plastic; very strongly acid.

Lenoir soils have a clayey Bt horizon 45 to more than 60 inches thick. These soils are very strongly acid or strongly acid, except where lime has been added.

The Ap or A horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 1 or 2.

The E horizon, where present, has hue of 10YR, value of 5 or 6, and chroma of 1 to 4.

The BA horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 3 to 6. Mottles are few to common, and some have chroma of 2 or less. The upper part of the Bt horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 to 6. Mottles are few to common, and some have chroma of 2 or less. The lower part of the Bt horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2. The Bt horizon is clay loam, silty clay, or clay. The BC horizon has hue of 10YR to 5Y, value of 5 to 7, and chroma of 1 or 2.

Lynchburg Series

The Lynchburg series consists of somewhat poorly drained soils on Coastal Plain uplands. Permeability is moderate. The slope is 0 to 2 percent.

Typical pedon of Lynchburg fine sandy loam, 0.75 mile south of the Virginia-North Carolina State Line on State Road 1310, 0.3 mile north of the intersection of State Road 1310 with State Road 1314, and 0.15 mile east of the road:

Ap—0 to 7 inches; very dark grayish brown (10YR 4/2) fine sandy loam; weak medium granular structure; very friable; many fine and medium roots; strongly acid; abrupt smooth boundary.

BA—7 to 10 inches; pale brown (10YR 6/3) fine sandy loam; weak medium subangular blocky structure; friable; few fine roots; very strongly acid; abrupt smooth boundary.

Bt—10 to 20 inches; pale brown (10YR 6/3) sandy clay loam; few fine distinct light gray (10YR 7/2) and yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; very strongly acid; gradual wavy boundary.

Btg—20 to 62 inches; light gray (10YR 7/2) sandy clay loam; sandy loam below a depth of 55 inches; many medium prominent yellowish brown (10YR 5/8) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; very strongly acid.

Lynchburg soils have a loamy Bt horizon that ranges from 45 to more than 60 inches thick. These soils are extremely acid to strongly acid, except where lime has been added.

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

The BA horizon, where present, has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. It is fine sandy loam. The upper part of the Bt horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 3 to 6. It has few to many mottles that have chroma of 2 or less. The lower part of the Bt horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. It has common to many mottles that have chroma of more than 2. In some pedons the Bt horizon is mottled in shades of yellow, brown, and gray. The Bt horizon is sandy clay loam or sandy clay in the lower part. The BCg horizon, where present, has hue of 10YR, value of 6 or 7, and chroma of 1. It is sandy loam.

Norfolk Series

The Norfolk series consists of well drained soils on Coastal Plain uplands. Permeability is moderate. The slope ranges from 0 to 10 percent.

Typical pedon of Norfolk loamy fine sand, 0 to 2 percent slopes, 0.3 mile south of the Virginia-North Carolina State Line on State Road 1310, 40 feet north of the intersection of State Road 1310 with State Road 1323, and 500 feet east on a farm road:

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) loamy fine sand; weak fine structure; very friable; many fine and medium roots; slightly acid; abrupt smooth boundary.

E—9 to 17 inches; light yellowish brown (2.5Y 6/4) loamy fine sand; weak fine granular structure; very friable; few fine roots; strongly acid; abrupt wavy boundary.

Bt1—17 to 23 inches; yellowish brown (10YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; thin patchy clay films on faces of peds; very strongly acid; clear wavy boundary.

Bt2—23 to 40 inches; yellowish brown (10YR 5/6) sandy clay loam; few prominent yellowish red (5YR 5/8) and common medium distinct strong brown (7.5YR 5/8) mottles; weak medium subangular blocky structure; friable, sticky and slightly plastic; thin patchy clay films on faces of peds; very strongly acid; clear wavy boundary.

Bt3—40 to 46 inches; yellowish brown (10YR 5/6) sandy clay loam; many medium distinct strong brown (7.5YR 5/8) and few medium prominent yellowish red (5YR 5/8) mottles; weak coarse subangular blocky structure; friable, sticky and slightly plastic; very strongly acid; gradual wavy boundary.

Bt4—46 to 61 inches; yellowish brown (10YR 5/8) sandy clay loam; many coarse prominent yellowish red (5YR 5/8), common medium distinct strong brown (7.5YR 5/8), and few fine faint light gray (10YR 7/2) mottles; weak fine subangular blocky structure; friable, slightly sticky; very strongly acid; gradual wavy boundary.

Btg—61 to 68 inches; light gray (10YR 7/2) sandy clay loam; common medium prominent red (10R 4/8), many medium faint brownish yellow (10YR 6/8), and many medium prominent reddish yellow (7.5YR 6/8) mottles; weak medium subangular blocky structure; friable, sticky; very strongly acid.

Norfolk soils have a loamy Bt horizon that ranges from 40 to more than 60 inches thick. These soils are very strongly acid or strongly acid, except where lime has been added.

The A or Ap horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 4.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 4.

The BA or BE horizon, where present, has hue of 10YR, value of 5 or 6, and chroma of 4 to 8. It is sandy loam. The Bt horizon has hue of 7.5YR to 2.5Y, value of 5 or 6, and chroma of 6 to 8. Gray mottles are at a depth of 36 inches or more. In some pedons, the lower part of the Bt horizon is mottled in shades of red, brown, and gray. The BC horizon, where present, is mottled in shades of gray, brown, yellow, or red. The B horizon is dominantly sandy clay loam.

Rains Series

The Rains series consists of poorly drained soils on Coastal Plain uplands. These soils are on broad flats and in slight depressions. Permeability is moderate. The slope is 0 to 1 percent.

Typical pedon of Rains fine sandy loam, 2.9 miles west of Britts store on State Road 1315 and 100 feet west of State Road 1310:

Ap—0 to 9 inches; very dark brown (10YR 2/2) fine sandy loam; weak fine granular structure; very friable; common fine and medium roots; very strongly acid; abrupt wavy boundary.

Btg1—9 to 28 inches; light brownish gray (10YR 6/2) sandy clay loam; common fine faint brownish yellow (10YR 6/6) mottles; weak fine subangular blocky structure; friable; many fine roots; very strongly acid; clear wavy boundary.

Btg2—28 to 35 inches; light brownish gray (10YR 6/2) sandy clay loam; common fine faint yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable, slightly sticky and slightly plastic; very strongly acid; clear smooth boundary.

Btg3—35 to 62 inches; light gray (10YR 7/2) sandy clay loam; few fine and medium distinct brownish yellow (10YR 6/8) mottles; weak medium subangular blocky structure; friable, sticky and slightly plastic; few pores; very strongly acid.

Rains soils have a loamy Bt horizon that ranges from 30 to more than 60 inches in thickness. These soils are very strongly acid or strongly acid, except where lime has been added.

The A, or Ap, horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. If the A, or Ap, horizon is very dark gray or black, it is less than 10 inches thick.

The E horizon, if present, has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 or 2.

The BAg horizon, where present, has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2. It is sandy loam or fine sandy loam. The Btg horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2. It is sandy clay loam. The BCg horizon, where present, has hue of 10YR, value of 4 to 7, and chroma of 1. It is

sandy loam, sandy clay loam, or sandy clay. The Btg and BCg horizons have few to many mottles that have chroma higher than that of the matrix.

Roanoke Series

The Roanoke series consists of poorly drained soils on river terraces. Permeability is slow. The slope is less than 2 percent.

Typical pedon of Roanoke loam, 1 mile south of Como on U.S. Highway 258, 0.25 mile east on State Road 1306, and 1,600 feet south:

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) loam; weak fine granular structure; friable; many fine roots; strongly acid; abrupt smooth boundary.

Btg1—7 to 10 inches; dark gray (10YR 4/1) clay; common medium distinct brownish yellow (10YR 6/8) mottles; weak fine subangular blocky structure; firm, slightly sticky and slightly plastic; many fine roots; few fine and medium pores; very strongly acid; clear smooth boundary.

Btg2—10 to 28 inches; dark gray (10YR 4/1) clay; few medium distinct brownish yellow (10YR 6/8) mottles; moderate medium subangular blocky structure; very firm, sticky and plastic; few medium roots; common thin faint patchy clay films on faces of peds; very strongly acid; gradual smooth boundary.

Btg3—28 to 33 inches; dark gray (10YR 4/1) clay; common medium distinct white (10YR 8/2) and brownish yellow (10YR 6/8) mottles; moderate medium subangular blocky structure; firm, sticky and plastic; few medium roots; common thin faint patchy clay films on faces of peds; very strongly acid; gradual smooth boundary.

Btg4—33 to 44 inches; dark gray (10YR 4/1) clay loam, few lenses of sand; many medium distinct white (10YR 8/2) and brownish yellow (10YR 6/8) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few flakes of mica; very strongly acid; gradual smooth boundary.

BCg—44 to 55 inches; dark gray (10YR 4/1) sandy clay loam; common medium distinct white (10YR 8/2) and few medium distinct brownish yellow (10YR 6/8) mottles; weak medium subangular blocky structure; friable, slightly sticky; few fine flakes of mica; very strongly acid; clear smooth boundary.

Cg—55 to 62 inches; gray (10YR 6/1) sandy loam, pockets of sandy clay loam; few medium distinct very pale brown (10YR 7/4) and brownish yellow (10YR 6/8) mottles; massive; friable; common fine flakes of mica; very strongly acid.

Roanoke soils have a clayey Bt horizon 15 to 40 inches thick. These soils are very strongly acid or strongly acid, except where lime has been added.

The A, or Ap, horizon has hue of 10YR, value of 4 or 5, and chroma of 1 or 2. If the A, or Ap, horizon is black or very dark gray, it is less than 10 inches thick.

The E horizon, where present, has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2.

The Btg and BCg horizons have hue of 10YR, value of 4 to 7, and chroma of 1 or 2. The Btg horizon is clay, silty clay, or clay loam. The BCg horizon is clay loam or sandy clay loam.

The Cg horizon is sandy or loamy material.

Rumford Series

The Rumford series consists of well drained or somewhat excessively drained soils on Coastal Plain uplands. Permeability is moderately rapid. The slope ranges from 0 to 3 percent.

Typical pedon of Rumford loamy sand, 0 to 3 percent slopes, 1.8 miles northeast of Mapleton on State Road 1305 and 400 feet north of the road:

Ap—0 to 6 inches; brown (10YR 4/3) loamy sand; weak fine granular structure; very friable to loose; common fine roots; strongly acid; abrupt smooth boundary.

E—6 to 14 inches; yellowish brown (10YR 5/4) loamy sand; weak fine granular structure; very friable to loose; common fine roots; strongly acid; diffuse smooth boundary.

BE—14 to 29 inches; strong brown (7.5YR 5/8) sandy loam; pockets of sandy clay; weak medium subangular blocky structure; very friable; few fine roots; very strongly acid; diffuse smooth boundary.

Bt—29 to 38 inches; strong brown (7.5YR 5/8) sandy loam; weak fine subangular blocky structure; very friable; few fine roots; very strongly acid; diffuse smooth boundary.

C1—38 to 57 inches; brownish yellow (10YR 6/6) fine sand; single grained; loose; friable; 2 percent quartz pebbles in lower part; very strongly acid; diffuse smooth boundary.

C2—57 to 63 inches; yellow (10YR 7/6) loamy sand; few medium faint white (10YR 8/2) mottles; weak fine subangular blocky structure; very friable; very strongly acid.

Rumford soils have a loamy Bt horizon 15 to 30 inches thick. These soils are very strongly acid or strongly acid throughout, except for the surface layer where lime has been added.

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

The E horizon has hue of 10YR, value of 4 to 6, and chroma of 3 or 4.

The Bt horizon has hue of 7.5YR or 10YR, value of 5 to 7, and chroma of 6 to 8. It is sandy loam.

The C horizon has hue of 10YR, value of 5 to 7, and chroma of 1 to 8. It is fine sand or loamy sand.

Seabrook Series

The Seabrook series consists of moderately well drained soils on Coastal Plain uplands. Permeability is rapid. These soils formed in sandy fluvial sediment. The slope is less than 2 percent.

Typical pedon of Seabrook loamy sand, 2.2 miles southwest of Barretts Cross Roads, 0.2 mile west of U.S. Highway 258, and 200 feet east of a farm road:

Ap—0 to 8 inches; dark brown (10YR 3/3) loamy sand; weak fine granular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.

C1—8 to 24 inches; yellowish brown (10YR 5/4) sand; massive; loose; very strongly acid; gradual wavy boundary.

C2—24 to 35 inches; pale brown (10YR 6/3) sand; few coarse distinct light brownish gray (10YR 6/2) mottles; massive; loose; very strongly acid; gradual wavy boundary.

C3—35 to 81 inches; light brownish gray (2.5Y 6/2) sand; massive; loose; few reddish ironstone nodules 1/4 to 1/2 inch in diameter at a depth of about 55 inches; very strongly acid.

Seabrook soils have a sandy horizon more than 72 inches thick. These soils range from very strongly acid to slightly acid.

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

The C horizon has hue of 10YR or 2.5Y and value of 5 to 7. Chroma is 3 to 8 in the upper part and 1 or 2 in the lower part. The C horizon is sand or loamy sand.

Tarboro Series

The Tarboro series consists of somewhat excessively drained soils on Coastal Plain stream terraces. Permeability is rapid. These soils formed in sandy fluvial deposits. The slope ranges from 0 to 5 percent.

Typical pedon of Tarboro sand, 0 to 5 percent slopes, 1.2 miles southwest of Barretts Cross Roads, 0.1 mile west of U.S. Highway 258, and 20 feet south of a farm road:

Ap—0 to 7 inches; brown (10YR 4/3) sand; single grained; loose; common fine and medium roots; strongly acid; clear wavy boundary.

C1—7 to 40 inches; yellowish brown (10YR 5/8) sand; single grained; loose; common fine and medium roots; few medium opaque sand grains; strongly acid; gradual wavy boundary.

C2—40 to 54 inches; yellowish brown (10YR 5/6) sand; lenses of brownish yellow (10YR 6/6) loamy sand in the lower part; single grained; loose; few fine roots; few medium opaque sand grains; strongly acid; gradual wavy boundary.

C3—54 to 85 inches; brownish yellow (10YR 6/6) sand; single grained; loose; strongly acid.

Tarboro soils have sandy material to a depth of 80 inches or more. These soils range from strongly acid to slightly acid, except where lime has been added.

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

The C horizon has hue of 10YR to 2.5Y, value of 4 to 8, and chroma of 3 to 8. It is sand or loamy sand.

Tomotley Series

The Tomotley series consists of poorly drained soils on low river terraces on the Coastal Plain. Permeability is moderate to moderately slow. The slope is less than 1 percent.

Typical pedon of Tomotley fine sandy loam, 3.5 miles southeast of Como on State Road 1306, 0.5 mile east of State Road 1308, and 20 feet north of the road:

Ap—0 to 11 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; very friable; many fine roots; strongly acid; clear smooth boundary.

E—11 to 15 inches; light brownish gray (10YR 6/2) fine sandy loam; many coarse prominent pale brown (10YR 6/2) mottles; weak fine granular structure; very friable; many fine roots; very strongly acid; gradual wavy boundary.

Btg1—15 to 20 inches; light gray (10YR 7/2) sandy clay loam; few fine distinct yellowish brown (10YR 5/8) and many common distinct pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; very strongly acid; gradual wavy boundary.

Btg2— 20 to 35 inches; light gray (10YR 7/1) sandy clay loam, thin pockets of sandy loam in lower part; common medium prominent brownish yellow (10YR 6/8) mottles; weak medium subangular blocky structure; friable; thin patchy clay films on faces of peds; few fine flakes of mica; very strongly acid; gradual wavy boundary.

BCg—35 to 44 inches; light gray (10YR 7/1) sandy loam, pockets of loamy sand; many medium prominent brownish yellow (10YR 6/8) mottles; weak medium subangular blocky structure; very friable; few fine flakes of mica; very strongly acid; gradual wavy boundary.

C1g—44 to 50 inches; light gray (2.5Y 7/2) sand; few fine faint brownish yellow (10YR 6/8) and white (10YR 8/2) mottles; massive; loose; few flakes of mica; very strongly acid; gradual wavy boundary.

C2g—50 to 60 inches; light gray (5Y 7/1) coarse sand; few fine faint light gray (2.5Y 7/2) mottles; massive; loose; few fine flakes of mica; very strongly acid.

Tomotley soils are loamy to a depth of 30 to 60 inches. These soils are very strongly acid or strongly acid, except where lime has been added.

The A, or Ap, horizon has hue of 10YR, value of 3 or 4, and chroma of 1 or 2. If the A, or Ap, horizon is black or very dark gray it is less than 10 inches thick. The BA horizon, if present, has hue of 10YR, value of 4 to 6, and chroma of 1 or 2.

The Bt and BC horizons have hue of 10YR to 5Y, value of 5 to 7, and chroma of 2 or less. The Bt and BC horizons, in places, have hue in shades of yellow, brown, red, or gray. The Bt horizon is sandy clay loam or clay loam. The BC horizon is sandy loam or sandy clay loam.

The C horizon is variable in texture, ranging from sand to clay. In some pedons it is stratified.

Wakulla Series

The Wakulla series consists of somewhat excessively drained soils on Coastal Plain uplands. Permeability is rapid. The slope ranges from 0 to 4 percent.

Typical pedon of Wakulla sand, 0.3 mile east of Harrellsville on North Carolina Highway 45, 1.7 miles northeast on State Road 1441, 1.1 miles north on State Road 1450, 0.1 mile east on a private road, and 200 feet east of the road:

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) sand; single grained; loose; few fine and medium roots; strongly acid; abrupt smooth boundary.

E—8 to 26 inches; yellowish brown (10YR 5/4) sand; single grained; loose; few fine and medium roots; very strongly acid; clear wavy boundary.

Bt—26 to 39 inches; yellowish brown (10YR 5/6) loamy sand; weak fine subangular blocky structure; few fine roots; some clay bridging between sand grains; very strongly acid; gradual wavy boundary.

C1—39 to 55 inches; mottled yellowish brown (10YR 5/6) and light gray (2.5Y 7/2) sand; single grained; loose; very strongly acid; gradual wavy boundary.

C2—55 to 72 inches; brown (10YR 4/3) coarse sand; single grained; loose; few pebbles; very strongly acid.

Wakulla soils have a loamy Bt horizon 12 to 30 inches thick. These soils are very strongly acid or strongly acid throughout, except for the surface layer where lime has been added.

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

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 4.

The Bt horizon has hue of 10YR, value of 5 to 7, and chroma of 6 to 8. It is loamy sand.

The C horizon has hue of 10YR, value of 5 to 8, and chroma of 1 to 8. It is sand or coarse sand.

Wehadkee Series

The Wehadkee series consists of poorly drained soils on flood plains. These soils formed in recent alluvium. Permeability is moderate. The slope is less than 2 percent.

Typical pedon of Wehadkee silt loam, 2.7 miles north of Barretts Cross Roads on State Road 1310, 2.9 miles northwest on State Road 1311, 0.5 mile south on a private road, and 20 feet west of the road:

A—0 to 4 inches; grayish brown (10YR 5/2) silt loam; few fine distinct dark yellowish brown (10YR 4/6) mottles; moderate medium granular structure; friable; many fine, medium, and coarse roots; very strongly acid; clear wavy boundary.

BAg—4 to 15 inches; grayish brown (10YR 5/2) silt loam; few fine distinct dark yellowish brown (10YR 4/6) mottles; weak medium subangular blocky structure; friable; many fine, medium, and coarse roots; very strongly acid; clear wavy boundary.

Bg1—15 to 20 inches; light brownish gray (10YR 6/2) loam; common coarse prominent yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; common fine roots; few fine flakes of mica; very strongly acid; gradual wavy boundary.

Bg2—20 to 42 inches; light brownish gray (10YR 6/2) clay loam; many coarse prominent strong brown (7.5YR 5/8) and common medium prominent yellowish brown (10YR 5/6) mottles; weak medium and coarse subangular blocky structure; friable; few roots; common fine flakes of mica; strongly acid; gradual wavy boundary.

Bg3—42 to 61 inches; gray (10YR 6/1) silty clay loam; many coarse distinct yellowish brown (10YR 5/6) mottles; massive; firm; common fine flakes of mica; slightly acid.

Wehadkee soils have a loamy B horizon that ranges from 30 to more than 60 inches in thickness. These soils range from very strongly acid to slightly acid.

The A horizon has hue of 10YR, value of 5 or 6, and chroma of 1 to 4.

The C horizon has hue of 10YR, value of 4 to 6, and chroma of 0 to 2. It is silt loam, loam, clay loam, or silty clay loam.

These soils are a taxadjunct to the Wehadkee series because they are more acid than is typical for Wehadkee soils. This difference, however, does not affect the use and management of the soils.

Wickham Series

The Wickham series consists of well drained soils on low river terraces on the Coastal Plain. Permeability is moderate. The slope ranges from 0 to 6 percent.

Typical pedon of Wickham sandy loam, 0.5 mile north of Parker's Ferry on State Road 1306 and 20 feet west of the road:

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

E—4 to 15 inches; light yellowish brown (2.5Y 6/4) sandy loam; weak medium granular structure; very friable; common fine roots; many fine flakes of mica; strongly acid; clear smooth boundary.

Bt—15 to 35 inches; yellowish red (5YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky; many fine flakes of mica; common fine roots; strongly acid; clear wavy boundary.

BC—35 to 43 inches; strong brown (7.5YR 5/8) sandy loam; many red and brown mottles; weak medium subangular blocky structure; very friable; common fine flakes of mica; strongly acid; clear wavy boundary.

C1—43 to 57 inches; strong brown (7.5YR 5/8) coarse loamy sand; many medium distinct brownish yellow (10YR 6/8) and yellowish red (5YR 5/6) mottles; single grained; loose; common fine flakes of mica; very strongly acid; gradual wavy boundary.

C2—57 to 67 inches; brownish yellow (10YR 6/6) coarse sand; single grained; loose; common fine flakes of mica; very strongly acid.

Wickham soils have a loamy Bt horizon 24 to 40 inches thick. These soils are very strongly acid or strongly acid, except where lime has been added.

The Ap horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 4.

The E horizon has hue of 10YR to 2.5Y, value of 4 to 6, and chroma of 3 to 8.

The BA or BE horizon, where present, has hue of 10YR, value of 4 to 6, and chroma of 4 to 8. It is sandy loam or fine sandy loam. The Bt horizon has hue of 5YR to 7.5YR, value of 4 to 6, and chroma of 4 to 8. It is sandy clay loam. The BC horizon has hue of 5YR to 10YR, value of 4 to 6, and chroma of 6 or 8. It is sandy loam or loamy sand.

The C horizon has hue of 7.5YR to 10YR, value of 5 to 8, and chroma of 3 to 8. It is coarse sand, sand, or loamy sand.

Wilbanks Series

The Wilbanks series consists of very poorly drained soils on flood plains. Permeability is slow to moderately slow. These soils formed in stratified clayey and loamy fluvial or marine sediment. The slope is less than 1 percent.

Typical pedon of Wilbanks silty clay loam, 2.8 miles south of St. John on State Road 1123 and State Road 1112, 0.3 mile south of State Road 1111, and 0.6 mile west on a farm road:

A1—0 to 5 inches; dark grayish brown (10YR 4/2) silty clay loam; weak fine granular structure; friable, slightly sticky; many fine and medium roots; strongly acid; abrupt wavy boundary.

A2—5 to 10 inches; very dark gray (10YR 3/1) silty clay; common medium prominent reddish brown (5YR 4/4) mottles; weak medium subangular blocky structure; firm, sticky and plastic; few fine roots; very strongly acid; gradual wavy boundary.

A3—10 to 18 inches; dark gray (5Y 4/1) silty clay; common medium distinct reddish brown (5YR 4/4) mottles; weak medium subangular blocky structure; firm, very sticky and very plastic; many fine roots; very strongly acid; clear smooth boundary.

A4—18 to 44 inches; black (2/1) silty clay; few medium prominent reddish brown (5YR 4/4) mottles; weak medium angular blocky structure; very firm, very sticky and plastic; many fine roots; few fine flakes of mica; very strongly acid; clear smooth boundary.

A5—44 to 50 inches; dark reddish brown (5YR 3/2) silty clay; weak medium blocky structure; firm, sticky and plastic; many fine roots; few fine flakes of mica; strongly acid; clear smooth boundary.

Cg—50 to 64 inches; dark reddish brown (5YR 3/2) silty clay loam; massive; firm to friable; many fine and medium roots; many flakes of mica; strongly acid.

Wilbanks soils have loamy and clayey horizons that average more than 35 percent clay in the 10- to 40-inch control section. These soils are very strongly acid or strongly acid in the 10- to 40-inch control section and in the surface layer, except where lime has been added. The C horizon below a depth of 40 inches ranges from very strongly acid to neutral.

The Al horizon has hue of 10YR or 5Y, value of 4 to 6, and chroma of 1 or 2. The A2, A3, A4, and A5 horizons have hue of 10YR, 5YR to 5Y, value of 2 to 4, and chroma of 1 or 2; or they have hue of 2.5Y, value of 3, and chroma of 2; or they are neutral and have value of 2 or 3.

The C horizon has hue of 5YR or 10YR, value of 3 to 7, and chroma of 1 or 2. It is sand, loamy sand, sandy loam, loam, sandy clay loam, clay loam, silty clay loam, silty clay, sandy clay, or clay or it is stratified.

Winton Series

The Winton series consists of well drained or moderately well drained soils on steep bluffs along rivers

or their major tributaries. Permeability is moderately slow or moderate. The slope ranges from 12 to 60 percent.

Typical pedon of Winton soils, 12 to 60 percent slopes, in the town of Winton; 75 feet south of the end of Fason Street, behind the County Agricultural Building:

A—0 to 4 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; very friable; many fine medium and coarse roots; strongly acid; clear smooth boundary.

E—4 to 11 inches; grayish brown (10YR 5/2) sandy loam; weak fine granular structure; very friable; few fine medium and coarse roots; strongly acid; clear wavy boundary.

Bt—11 to 24 inches; brownish yellow (10YR 6/6) clay loam; few fine distinct reddish yellow (7.5YR 6/6) and pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; friable, slightly sticky and slightly plastic; few medium and coarse roots; few fine flakes of mica; few thin discontinuous clay films on faces of peds; very strongly acid; gradual smooth boundary.

BC—24 to 35 inches; brownish yellow (10YR 6/6) sandy loam; pockets of light gray (10YR 7/1) clay; few fine distinct reddish yellow (7.5YR 6/8) mottles; weak fine subangular blocky structure; friable; few fine flakes of mica; very strongly acid; gradual wavy boundary.

C—35 to 62 inches; light gray (2.5Y 7/2) fine sand; pockets of light gray (10YR 7/1) sandy clay loam; few fine distinct brownish yellow (10YR 6/6) mottles; single grained; very friable; few fine flakes of mica; strongly acid.

Winton soils have a loamy Bt horizon that ranges from 10 to 35 inches in thickness. These soils are very strongly acid to medium acid.

The A horizon has hue of 7.5YR or 2.5Y, value of 3 to 5, and chroma of 1 to 4.

The E horizon has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 2 to 6. The E horizon is fine sandy loam, sandy loam, loam, or loamy sand.

The Bt horizon has hue of 7.5 to 2.5, value of 4 to 6, and chroma of 3 to 8. Where the Bt horizon is more than 18 inches thick, gray or light gray mottles are within a depth of 24 inches. In some pedons the lower Bt horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 or 2; mottles in shades of red, brown, and yellow are in these pedons. The Bt horizon is sandy clay loam, sandy loam, or clay loam. The BC horizon is similar in color to the Bt horizon; it has a gray matrix or has mottles of low and high chroma. The BC horizon is fine sandy loam, sandy loam, or loamy sand.

The C horizon has hue of 10YR to 2.5Y, value of 3 to 8, and chroma of 0 to 8, or it is mottled. It ranges from sand to clay and is commonly stratified.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly such soil formed in recent alluvium or on steep rocky slopes.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

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	9 to 12
Very high	more than 12

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 coating, clay skin.

Coarse textured soil. Sand or loamy sand.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

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. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively

drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Fast intake (in tables). The rapid movement of water into the soil.

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.

Fine textured soil. Sandy clay, silty clay, and clay.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an upper case letter represents the major horizons. Numbers or lower case letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual*. The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is in part a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these. The combined A and B horizons are generally called the solum, or true soil.

If a soil does not have a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Arabic numeral 2 precedes the letter C.

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.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

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.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

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.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

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).

Muck. Dark colored, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of 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

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

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.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

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.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

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 layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Recorded in the period 1951-78 at Jackson, N.C.]

Month	Temperature						Precipitation				
	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[1]	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	50.4	29.2	39.9	75	7	32	3.61	2.16	4.91	8	2.1
February	53.6	31.1	42.4	76	10	26	3.79	2.35	5.08	7	1.8
March	61.7	37.7	49.7	85	20	130	3.92	2.77	4.96	8	.8
April	73.2	46.4	59.8	91	28	297	3.11	1.89	4.19	6	.0
May	79.7	55.3	67.6	95	35	546	4.02	2.11	5.69	8	.0
June	86.1	62.7	74.4	99	47	732	3.73	2.27	5.03	7	.0
July	89.1	67.1	78.1	100	54	871	5.37	2.83	7.58	8	.0
August	87.7	66.5	77.1	98	51	840	5.41	2.70	7.75	8	.0
September	82.7	59.9	71.3	97	41	639	3.62	1.46	5.43	5	.0
October	72.7	48.9	60.8	90	27	341	3.19	1.03	4.95	5	.0
November	63.0	38.6	50.8	83	19	98	2.89	1.60	4.03	5	.0
December	53.3	31.1	42.2	76	10	52	3.64	2.12	4.99	7	1.6
Yearly:											
Average	71.1	47.9	59.5	---	---	---	---	---	---	---	---
Extreme	---	---	---	102	7	---	---	---	---	---	---
Total	---	---	---	---	---	4,604	46.30	42.38	51.07	82	6.3

[1] A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 °F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Recorded in the period 1951-78 at Jackson, N.C.]

Probability	Temperature		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	March 30	April 12	April 25
2 years in 10 later than--	March 23	April 7	April 20
5 years in 10 later than--	March 11	March 28	April 10
First freezing temperature in fall:			
1 year in 10 earlier than--	November 4	October 25	October 16
2 years in 10 earlier than--	November 9	October 29	October 19
5 years in 10 earlier than--	November 20	November 7	October 26

TABLE 3.--GROWING SEASON

[Recorded in the period 1951-78 at Jackson, N.C.]

Probability	Length of growing season if daily minimum temperature is--		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	230	201	182
8 years in 10	238	209	188
5 years in 10	254	224	199
2 years in 10	269	239	210
1 year in 10	277	247	216

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
AtA	Altavista fine sandy loam, 0 to 2 percent slopes	1,390	0.6
AuB	Autryville loamy sand, 0 to 5 percent slopes	596	0.3
BB	Bibb soils	10,668	4.7
BoB	Bonneau loamy sand, 0 to 6 percent slopes	7,288	3.2
BoC	Bonneau loamy sand, 6 to 12 percent slopes	2,616	1.1
CaA	Caroline fine sandy loam, 0 to 2 percent slopes	4,359	1.9
CaB	Caroline fine sandy loam, 2 to 6 percent slopes	1,728	0.8
CoB	Conetoe loamy sand, 0 to 5 percent slopes	4,303	1.9
CrA	Craven fine sandy loam, 0 to 1 percent slopes	27,646	12.1
CrB	Craven fine sandy loam, 1 to 4 percent slopes	18,377	8.1
CrC2	Craven fine sandy loam, 4 to 8 percent slopes, eroded	3,529	1.6
CrD2	Craven fine sandy loam, 8 to 12 percent slopes, eroded	945	0.4
CsA	Craven-Urban land complex, 0 to 2 percent slopes	1,203	0.5
DO	Dorovan soils	16,008	7.0
ExA	Exum very fine sandy loam, 0 to 2 percent slopes	735	0.3
GoA	Goldsboro fine sandy loam, 0 to 2 percent slopes	5,625	2.5
GpA	Goldsboro-Urban land complex, 0 to 2 percent slopes	468	0.2
LF	Leaf loam	46,095	20.2
Ln	Lenoir loam	19,380	8.5
Ly	Lynchburg fine sandy loam	2,352	1.0
NoA	Norfolk loamy fine sand, 0 to 2 percent slopes	8,398	3.7
NoB	Norfolk loamy fine sand, 2 to 6 percent slopes	9,666	4.2
NoC	Norfolk loamy fine sand, 6 to 10 percent slopes	981	0.4
Ra	Rains fine sandy loam	6,497	2.9
Ro	Roanoke loam	1,852	0.8
RuA	Rumford loamy sand, 0 to 3 percent slopes	287	0.1
Se	Seabrook loamy sand	905	0.4
TaB	Tarboro sand, 0 to 5 percent slopes	4,487	2.0
To	Tomotley fine sandy loam	1,431	0.6
Ud	Udorthents, sandy	1,032	0.5
WaB	Wakulla sand, 0 to 4 percent slopes	258	0.1
We	Wehadkee silt loam	2,558	1.1
WkA	Wickham sandy loam, 0 to 2 percent slopes	1,766	0.8
WkB	Wickham sandy loam, 2 to 6 percent slopes	1,626	0.7
WN	Wilbanks silty clay loam	4,447	2.0
WT	Winton soils, 12 to 60 percent slopes	5,138	2.3
	Water	1,200	0.5
	Total	227,840	100.0

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE

[Yields in the N columns are for nonirrigated soils; those in the I columns are for irrigated soils. Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Soil name and map symbol	Corn		Soybeans		Peanuts		Tobacco		Improved bermudagrass		Grass-clover		Cotton	
	N	I	N	I	N	I	N	I	N	I	N	I	N	I
	Bu	Bu	Bu	Bu	Lb	Lb	Lb	Lb	AUM*	AUM*	AUM*	AUM*	Lb	Lb
AtA---- Altavista	120	150	30	40	---	---	2,000	2,600	9.0	---	9.0	---	500	550
AuB---- Autryville	75	125	20	35	3,000	3,700	2,200	2,500	9.0	---	8.5	---	600	680
BB---- Bibb	100	130	25	35	---	---	---	---	---	---	---	---	---	---
BoB---- Bonneau	75	110	20	30	2,900	3,600	2,400	2,700	8.5	---	---	---	550	---
BoC---- Bonneau	75	110	20	30	2,800	3,300	2,400	2,700	8.0	---	---	---	550	---
CaA---- Caroline	115	150	30	40	3,000	3,700	2,400	2,700	---	---	---	---	1,000	---
CaB---- Caroline	110	150	30	40	3,000	3,700	2,400	2,700	---	---	---	---	1,000	---
CoB---- Conetoe	70	120	20	35	2,700	3,400	2,000	2,200	---	---	---	---	---	---
CrA---- Craven	115	150	30	40	2,900	3,400	2,000	2,400	---	---	10.0	---	600	---
CrB---- Craven	90	140	30	40	2,700	3,400	2,000	2,400	---	---	10.0	---	600	---
CrC2---- Craven	80	130	20	---	1,800	---	1,800	2,400	---	---	8.0	---	---	---
CrD2---- Craven	---	---	---	---	---	---	---	---	---	---	7.5	---	---	---
CsA---- Craven-Urban land	---	---	---	---	---	---	---	---	---	---	---	---	---	---
DO---- Dorovan	---	---	---	---	---	---	---	---	---	---	---	---	---	---
ExA---- Exum	125	175	40	50	3,900	4,600	3,000	3,000	---	---	---	---	750	---
GoA---- Goldsboro	125	175	35	45	3,600	4,300	3,000	3,000	11.5	---	11.5	---	700	---
GpA---- Goldsboro-Urban land	---	---	---	---	---	---	---	---	---	---	---	---	---	---
LF---- Leaf	60	75	20	35	---	---	---	---	---	---	8.0	---	---	---

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn		Soybeans		Peanuts		Tobacco		Improved bermudagrass		Grass-clover		Cotton	
	N	I	N	I	N	I	N	I	N	I	N	I	N	I
	Bu	Bu	Bu	Bu	Lb	Lb	Lb	Lb	AUM*	AUM*	AUM*	AUM*	Lb	Lb
Ln---------- Lenoir	70	90	25	35	2,700	3,000	2,000	---	---	---	10.0	---	425	---
Ly---------- Lynchburg	115	165	30	40	3,300	---	---	---	---	---	10.0	---	700	---
NoA---------- Norfolk	110	160	30	40	4,000	4,700	60	---	---	---	10.5	---	800	---
NoB---------- Norfolk	100	150	30	40	3,700	4,300	2,500	---	---	---	10.0	---	700	---
NoC---------- Norfolk	90	---	20	---	3,300	---	50	---	---	---	9.5	---	---	---
Ra---------- Rains	110	150	30	40	3,000	3,200	2,300	---	---	---	9.0	---	450	---
Ro---------- Roanoke	120	---	40	---	---	---	---	---	---	---	6.8	---	---	---
RuA---------- Rumford	80	125	20	30	3,000	3,700	2,000	2,300	---	---	9.5	---	---	---
Se---------- Seabrook	70	100	20	30	2,600	3,300	2,000	2,300	9.0	---	---	---	---	---
TaB---------- Tarboro	50	90	15	25	2,000	2,500	1,800	2,000	---	---	6.0	---	---	---
To---------- Tomotley	120	---	40	---	---	---	---	---	---	---	---	---	---	---
Ud---------- Udorthents	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WaB---------- Wakulla	45	---	20	---	---	---	1,700	---	---	---	---	---	---	---
We---------- Wehadkee	---	---	---	---	---	---	---	---	---	---	---	---	---	---
WkA---------- Wickham	120	170	30	40	3,400	4,100	2,800	3,000	---	---	10.0	---	800	---
WkB---------- Wickham	115	160	30	40	3,300	4,000	2,800	3,000	---	---	9.5	---	800	---
WN---------- Wilbanks	90	---	30	---	---	---	---	---	---	---	8.0	---	---	---
WT**---------- Winton	---	---	---	---	---	---	---	---	---	---	---	---	---	---

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 6.--CAPABILITY CLASSES AND SUBCLASSES

[Absence of an entry indicates no acreage]

Class	Total acreage	Major management concerns (Subclass)		
		Erosion (e)	Wetness (w)	Soil problem (s)
		Acres	Acres	Acres
I	14,523	---	---	---
II	63,536	13,020	38,042	12,474
III	47,677	22,647	19,380	5,650
IV	49,624	3,529	46,095	---
V	10,668	---	10,668	---
VI	3,503	945	2,558	---
VII	21,146	5,138	16,008	---
VIII	---	---	---	---

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Soil name and map symbol	Ordination symbol	Management concerns			Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Common trees	Site index	
AtA---------- Altavista	2w	Slight	Moderate	Slight	Loblolly pine------- Longleaf pine------- Shortleaf pine------ Sweetgum---------- White oak----------	91 84 77 84 ---	Loblolly pine, yellow-poplar, black walnut, sweetgum, American sycamore, cherrybark oak.
AuB---------- Autryville	3s	Slight	Moderate	Moderate	Loblolly pine------- Longleaf pine-------	77 ---	Loblolly pine, longleaf pine.
BB*---------- Bibb	2w	Slight	Severe	Severe	Loblolly pine------- Sweetgum---------- Water oak---------- Blackgum----------	90 90 90 ---	Eastern cottonwood, loblolly pine, sweetgum, yellow-poplar.
BoB, BoC---------- Bonneau	2s	Slight	Moderate	Moderate	Loblolly pine------- Longleaf pine-------	95 75	Loblolly pine, longleaf pine.
CaA, CaB---------- Caroline	3o	Slight	Slight	Slight	Shortleaf pine------ Virginia pine------- Loblolly pine------- Southern red oak---- White oak----------	70 70 76 70 75	Loblolly pine.
CoB---------- Conetoe	3s	Slight	Moderate	Moderate	Loblolly pine------- Longleaf pine-------	80 65	Loblolly pine.
CrA, CrB, CrC2, CrD2---------- Craven	3w	Slight	Moderate	Slight	Loblolly pine------- Longleaf pine------- Water oak---------- Sweetgum---------- White oak---------- Southern red oak---- Red maple----------	81 67 --- --- --- --- ---	Loblolly pine.
DO*---------- Dorovan	4w	Slight	Severe	Severe	Blackgum---------- Sweetbay----------	70 ---	Baldcypress.
ExA---------- Exum	2w	Slight	Moderate	Slight	Loblolly pine------- Longleaf pine------- Sweetgum---------- Yellow-poplar------- Southern red oak---- White oak----------	90 77 90 100 --- ---	Loblolly pine, yellow-poplar, sweetgum, American sycamore.
GoA---------- Goldsboro	2w	Slight	Moderate	Slight	Loblolly pine------- Longleaf pine------- Sweetgum---------- Southern red oak---- White oak----------	90 77 90 --- ---	Loblolly pine, yellow-poplar, American sycamore, sweetgum.
LF*---------- Leaf	2w	Slight	Severe	Severe	Loblolly pine------- Sweetgum----------	90 90	Loblolly pine, Shumard oak, sweetgum.
Ln---------- Lenoir	2w	Slight	Moderate	Moderate	Loblolly pine-------	90	Loblolly pine, longleaf pine, sweetgum, 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	Common trees	Site index	
Ly---------- Lynchburg	2w	Slight	Moderate	Slight	Loblolly pine------- Longleaf pine------- Yellow-poplar------- Sweetgum---------- Southern red oak---- White oak---------- Blackgum----------	86 74 92 90 --- --- ---	Loblolly pine, American sycamore, sweetgum.
NoA, NoB, NoC------	2o	Slight	Slight	Slight	Loblolly pine------- Longleaf pine-------	86 68	Loblolly pine.
Ra---------- Rains	2w	Slight	Severe	Severe	Loblolly pine------- Sweetgum---------- ----------	94 90 ---	Loblolly pine, sweetgum, American sycamore.
Ro---------- Roanoke	2w	Slight	Severe	Severe	Loblolly pine------- Virginia pine------- Willow oak---------- Yellow-poplar-------	86 76 76 90	Loblolly pine, sweetgum, yellow-poplar.
RuA---------- Rumford	3o	Slight	Slight	Slight	Southern red oak---- Virginia pine------- Loblolly pine-------	65 70 80	Loblolly pine.
Se---------- Seabrook	3s	Slight	Moderate	Moderate	Loblolly pine------- Longleaf pine-------	87 70	Loblolly pine, longleaf pine.
TaB---------- Tarboro	4s	Slight	Moderate	Moderate	Loblolly pine------- Longleaf pine-------	71 ---	Loblolly pine.
To---------- Tomotley	2w	Slight	Severe	Severe	Loblolly pine------- Sweetgum---------- Water tupelo--------	94 90 ---	Loblolly pine, sweetgum, American sycamore.
WaB---------- Wakulla	3s	Slight	Moderate	Moderate	Loblolly pine------- Longleaf pine-------	73 78	Loblolly pine, longleaf pine.
We---------- Wehadkee	1w	Slight	Severe	Severe	Loblolly pine------- Sweetgum---------- Yellow-poplar------- Willow oak---------- Green ash---------- Water oak---------- White ash----------	102 93 98 90 96 86 88	Loblolly pine, American sycamore, yellow-poplar, green ash, sweetgum, eastern cottonwood, cherrybark oak.
WkA, WkB---------- Wickham	2o	Slight	Slight	Slight	Loblolly pine------- Yellow-poplar------- Southern red oak----	90 100 ---	Loblolly pine, yellow-poplar.
WN*---------- Wilbanks	1w	Slight	Severe	Severe	Water oak---------- Sweetgum---------- Baldcypress---------	100 111 ---	Sweetgum, loblolly pine, water tupelo.
WT*---------- Winton	3r	Severe	Severe	Moderate	Southern red oak---- Sweetgum----------	--- ---	Southern red oak, sweetgum, loblolly pine.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
AtA Altavista	Severe: flooding.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
AuB Autryville	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
BB* Bibb	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
BoB Bonneau	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Moderate: droughty.
BoC Bonneau	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: droughty, slope.
CaA Caroline	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: small stones, percs slowly.	Slight	Slight.
CaB Caroline	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones, percs slowly.	Slight	Slight.
CoB Conetoe	Severe: flooding.	Slight	Moderate: slope.	Slight	Moderate: droughty.
CrA Craven	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Slight	Slight.
CrB Craven	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight	Slight.
CrC2 Craven	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: slope.	Slight	Slight.
CrD2 Craven	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
CsA*: Craven	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Slight	Slight.
Urban land.					
DO* Dorovan	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.	Severe: ponding, flooding, excess humus.
ExA Exum	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Slight	Slight.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
GoA---------- Goldsboro	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Slight----------	Slight.
GpA*: Goldsboro----------	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Slight----------	Slight.
Urban land.					
LF*---------- Leaf	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ln---------- Lenoir	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Ly---------- Lynchburg	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
NoA---------- Norfolk	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
NoB---------- Norfolk	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
NoC---------- Norfolk	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
Ra---------- Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ro---------- Roanoke	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
RuA---------- Rumford	Slight----------	Slight----------	Moderate: small stones.	Slight----------	Moderate: droughty.
Se---------- Seabrook	Severe: flooding.	Moderate: wetness.	Moderate: wetness.	Slight----------	Severe: droughty.
TaB---------- Tarboro	Severe: flooding, too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty, too sandy.
To---------- Tomotley	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ud. Udorthents					
WaB---------- Wakulla	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
We---------- Wehadkee	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
WkA---------- Wickham	Severe: flooding.	Slight----------	Slight----------	Slight----------	Slight.
WkB---------- Wickham	Severe: flooding.	Slight----------	Moderate: slope.	Slight----------	Slight.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
WN*---------- Wilbanks	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
WT*---------- Winton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
AtA---- Altavista	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
AuB---- Autryville	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
BB*---- Bibb	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
BoB, BoC---- Bonneau	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
CaA, CaB---- Caroline	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CoB---- Conetoe	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Fair	Very poor.
CrA---- Craven	Good	Good	Good	Good	Good	Poor	Good	Good	Good	Poor.
CrB---- Craven	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CrC2, CrD2---- Craven	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CsA*: Craven----	Good	Good	Good	Good	Good	Poor	Good	Good	Good	Poor.
Urban land.										
DO*---- Dorovan	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
ExA---- Exum	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
GoA---- Goldsboro	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
GpA*: Goldsboro----	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Urban land.										
LF*---- Leaf	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Ln---- Lenoir	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Ly---- Lynchburg	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
NoA, NoB---- Norfolk	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
NoC---- Norfolk	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
Ra---- Rains	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Ro---- Roanoke	Good	Good	Good	Fair	Fair	Good	Good	Good	Fair	Good
RuA---- Rumford	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Se---- Seabrook	Fair	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
TaB---- Tarboro	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
To---- Tomotley	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Ud. Udorthents										
WaB---- Wakulla	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
We---- Wehadkee	Very poor.	Poor	Poor	Fair	Fair	Good	Fair	Poor	Fair	Fair.
WkA---- Wickham	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
WkB---- Wickham	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
WN*---- Wilbanks	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Fair	Good.
WT*---- Winton	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
AtA---------- Altavista	Severe: wetness, cutbanks cave.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.	Moderate: wetness.
AuB---------- Autryville	Moderate: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Moderate: droughty.
BB*---------- Bibb	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
BoB---------- Bonneau	Moderate: wetness.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Moderate: droughty.
BoC---------- Bonneau	Moderate: wetness, slope.	Moderate: slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
CaA---------- Caroline	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
CaB---------- Caroline	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: slope, shrink-swell.	Severe: low strength.	Slight.
CoB---------- Conetoe	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Moderate: droughty.
CrA, CrB---------- Craven	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength.	Slight.
CrC2---------- Craven	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: low strength.	Slight.
CrD2---------- Craven	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: wetness.	Severe: slope.	Severe: low strength.	Moderate: slope.
CsA*: Craven----------	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength.	Slight.
Urban land.						
DO*---------- Dorovan	Severe: excess humus, ponding.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding.	Severe: flooding, ponding, low strength.	Severe: ponding, flooding.	Severe: ponding, flooding, excess humus.
ExA---------- Exum	Moderate: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: low strength, wetness.	Slight.
GoA---------- Goldsboro	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Slight.
GpA*: Goldsboro--------	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Slight.
Urban land.						

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
LF*---------- Leaf	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, wetness.	Severe: wetness.
Ln---------- Lenoir	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
Ly---------- Lynchburg	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
NoA---------- Norfolk	Moderate: wetness.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Slight.
NoB---------- Norfolk	Moderate: wetness.	Slight---------	Moderate: wetness.	Moderate: slope.	Slight---------	Slight.
NoC---------- Norfolk	Moderate: wetness, slope.	Moderate: slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.
Ra---------- Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ro---------- Roanoke	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness.	Severe: wetness.
RuA---------- Rumford	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty.
Se---------- Seabrook	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: wetness, flooding.	Severe: flooding.	Moderate: wetness, flooding.	Severe: droughty.
TaB---------- Tarboro	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Moderate: droughty, too sandy.
To---------- Tomotley	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.
Ud. Udorthents						
WaB---------- Wakulla	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Severe: droughty.
We---------- Wehadkee	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
WkA, WkB---------- Wickham	Slight---------	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Slight.
WN*---------- Wilbanks	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
WT*---------- Winton	Severe: wetness, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AtA Altavista	Severe: wetness.	Severe: flooding, wetness.	Severe: wetness.	Severe: seepage, wetness.	Fair: wetness.
AuB Autryville	Moderate: wetness.	Severe: seepage.	Slight	Severe: seepage.	Fair: too sandy.
BB* Bibb	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
BoB Bonneau	Moderate: wetness.	Severe: seepage.	Severe: wetness.	Moderate: wetness.	Good.
BoC Bonneau	Moderate: wetness, slope.	Severe: seepage, slope.	Severe: wetness.	Moderate: wetness, slope.	Fair: slope.
CaA Caroline	Severe: percs slowly.	Slight	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
CaB Caroline	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
CoB Conetoe	Slight	Severe: seepage, flooding.	Severe: seepage.	Severe: seepage.	Poor: seepage.
CrA Craven	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
CrB, CrC2 Craven	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
CrD2 Craven	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
CsA*: Craven	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
Urban land.					
DO* Dorovan	Severe: flooding, ponding, poor filter.	Severe: flooding, excess humus, ponding.	Severe: flooding, seepage, ponding.	Severe: flooding, ponding.	Poor: ponding, excess humus.
ExA Exum	Severe: wetness.	Slight	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
GoA Goldsboro	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
GpA*: Goldsboro	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
Urban land.					
LF* Leaf	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Ln Lenoir	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
Ly Lynchburg	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
NoA, NoB Norfolk	Moderate: wetness.	Moderate: seepage.	Slight	Slight	Slight.
NoC Norfolk	Moderate: wetness, slope.	Severe: slope.	Moderate: slope.	Slight	Fair: slope.
Ra Rains	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Ro Roanoke	Severe: wetness, percs slowly.	Severe: seepage, flooding, wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: hard to pack, too clayey, wetness.
RuA Rumford	Slight	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Se Seabrook	Severe: wetness, poor filter.	Severe: seepage, wetness, flooding.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
TaB Tarboro	Severe: poor filter.	Severe: seepage, flooding.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
To Tomotley	Severe: wetness, percs slowly.	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Ud. Udorthents					
WaB Wakulla	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: seepage.
We Wehadkee	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
WkA, WkB Wickham	Moderate: flooding.	Severe: flooding.	Severe: seepage.	Moderate: flooding.	Fair: thin layer.
WN* Wilbanks	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
WT*---------- Winton	Severe: wetness, slope.	Severe: wetness, slope.	Severe: slope.	Severe: slope, seepage.	Poor: slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," "probable," and "improbable." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Roadfill	Sand	Topsoil
AtA---------- Altavista	Fair: wetness, thin layer.	Improbable: excess fines.	Good.
AuB---------- Autryville	Good----------	Improbable: thin layer.	Fair: too sandy.
BB*---------- Bibb	Poor: wetness.	Improbable: excess fines.	Poor: wetness.
BoB---------- Bonneau	Good----------	Improbable: excess fines.	Fair: too sandy.
BoC---------- Bonneau	Good----------	Improbable: excess fines.	Fair: too sandy, slope.
CaA, CaB---------- Caroline	Poor: low strength.	Improbable: excess fines.	Poor: thin layer.
CoB---------- Conetoe	Good----------	Probable----------	Fair: too sandy.
CrA, CrB, CrC2, CrD2-- Craven	Poor: low strength.	Improbable: excess fines.	Poor: thin layer.
CsA*: Craven----------	Poor: low strength.	Improbable: excess fines.	Poor: thin layer.
Urban land.			
DO*---------- Dorovan	Poor: wetness.	Probable----------	Poor: excess humus, wetness.
ExA---------- Exum	Fair: wetness.	Improbable: excess fines.	Good.
GoA---------- Goldsboro	Fair: wetness.	Improbable: excess fines.	Good.
GpA*: Goldsboro----------	Fair: wetness.	Improbable: excess fines.	Good.
Urban land.			
LF*---------- Leaf	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Poor: thin layer, wetness, too clayey.
Ln---------- Lenoir	Poor: low strength.	Improbable: excess fines.	Poor: thin layer.
Ly---------- Lynchburg	Poor: wetness.	Improbable: excess fines.	Poor: wetness.
NoA, NoB, NoC---------- Norfolk	Good----------	Improbable: excess fines.	Fair: too sandy.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Topsoil
Ra---------- Rains	Poor: wetness.	Improbable: excess fines.	Poor: wetness.
Ro---------- Roanoke	Poor: low strength, wetness.	Improbable: excess fines.	Poor: thin layer, wetness.
RuA---------- Rumford	Good----------	Improbable: thin layer.	Fair: small stones, area reclaim.
Se---------- Seabrook	Fair: wetness.	Probable----------	Fair: too sandy, small stones.
TaB---------- Tarboro	Good----------	Probable----------	Poor: too sandy.
To---------- Tomotley	Poor: wetness.	Improbable: excess fines.	Poor: wetness.
Ud. Udorthents			
WaB---------- Wakulla	Good----------	Probable----------	Poor: too sandy.
We---------- Wehadkee	Poor: wetness.	Improbable: excess fines.	Poor: wetness.
WkA, WkB---------- Wickham	Fair: thin layer.	Improbable: excess fines.	Good.
WN*---------- Wilbanks	Poor: low strength, wetness.	Improbable: excess fines.	Poor: thin layer, wetness.
WT*---------- Winton	Poor: low strength, slope.	Improbable: excess fines.	Poor: slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated]

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
AtA---------- Altavista	Moderate: seepage.	Moderate: wetness.	Favorable------	Wetness--------	Wetness--------	Favorable.
AuB---------- Autryville	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake.	Too sandy------	Droughty.
BB*---------- Bibb	Moderate: seepage.	Severe: piping, wetness.	Flooding-------	Wetness, flooding.	Wetness--------	Wetness.
BoB---------- Bonneau	Moderate: seepage, slope.	Slight---------	Deep to water	Droughty, fast intake, slope.	Soil blowing---	Droughty.
BoC---------- Bonneau	Severe: slope.	Slight---------	Deep to water	Droughty, fast intake, slope.	Slope, soil blowing.	Slope, droughty.
CaA---------- Caroline	Slight---------	Moderate: hard to pack.	Deep to water	Percs slowly, erodes easily.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
CaB---------- Caroline	Moderate: slope.	Moderate: hard to pack.	Deep to water	Percs slowly, slope, erodes easily.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
CoB---------- Conetoe	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake.	Too sandy------	Droughty.
CrA, CrB---------- Craven	Slight---------	Moderate: hard to pack, wetness.	Percs slowly---	Wetness, percs slowly.	Erodes easily, wetness.	Erodes easily, percs slowly.
CrC2---------- Craven	Slight---------	Moderate: hard to pack, wetness.	Percs slowly, slope.	Wetness, percs slowly, slope.	Erodes easily, wetness.	Erodes easily, percs slowly.
CrD2---------- Craven	Slight---------	Moderate: hard to pack, wetness.	Percs slowly, slope.	Wetness, percs slowly, slope.	Slope, erodes easily, wetness.	Slope, erodes easily, percs slowly.
CsA*: Craven----------	Slight---------	Moderate: hard to pack, wetness.	Percs slowly---	Wetness, percs slowly.	Erodes easily, wetness.	Erodes easily, percs slowly.
Urban land.						
DO*---------- Dorovan	Moderate: seepage.	Severe: excess humus, ponding.	Ponding, flooding, subsides.	Ponding, flooding.	Ponding--------	Wetness.
ExA---------- Exum	Moderate: seepage.	Moderate: piping, wetness.	Favorable------	Wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.
GoA---------- Goldsboro	Moderate: seepage.	Moderate: wetness.	Favorable------	Wetness--------	Wetness--------	Favorable.
GpA*: Goldsboro--------	Moderate: seepage.	Moderate: wetness.	Favorable------	Wetness--------	Wetness--------	Favorable.
Urban land.						

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
LF*---- Leaf	Slight----	Severe: wetness.	Percs slowly---	Wetness, percs slowly	Wetness, percs slowly.	Wetness, percs slowly.
Ln---- Lenoir	Slight----	Severe: wetness.	Percs slowly---	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
Ly---- Lynchburg	Moderate: seepage.	Severe: piping, wetness.	Favorable----	Wetness----	Wetness----	Wetness.
NoA---- Norfolk	Moderate: seepage.	Slight----	Deep to water	Fast intake----	Favorable----	Favorable.
NoB---- Norfolk	Moderate: seepage.	Slight----	Deep to water	Slope----	Favorable----	Favorable.
NoC---- Norfolk	Moderate: seepage.	Slight----	Deep to water	Slope----	Slope----	Slope.
Ra---- Rains	Moderate: seepage.	Severe: piping, wetness.	Favorable----	Wetness, soil blowing.	Wetness, soil blowing.	Wetness.
Ro---- Roanoke	Moderate: seepage.	Severe: wetness.	Percs slowly---	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
RuA---- Rumford	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
Se---- Seabrook	Severe: seepage.	Severe: seepage, piping.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Droughty.
TaB---- Tarboro	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake.	Too sandy----	Droughty.
To---- Tomotley	Moderate: seepage.	Severe: piping, wetness.	Favorable----	Wetness, soil blowing.	Wetness, soil blowing.	Wetness.
Ud. Udorthents						
WaB---- Wakulla	Severe: seepage.	Severe: seepage, piping.	Deep to water	Droughty, fast intake.	Too sandy----	Droughty.
We---- Wehadkee	Moderate: seepage.	Severe: wetness.	Flooding----	Wetness, flooding.	Wetness----	Wetness.
WkA---- Wickham	Moderate: seepage.	Moderate: thin layer.	Deep to water	Favorable----	Favorable----	Favorable.
WkB---- Wickham	Moderate: seepage.	Moderate: thin layer.	Deep to water	Slope----	Favorable----	Favorable.
WN*---- Wilbanks	Slight----	Severe: hard to pack, wetness.	Percs slowly, flooding.	Wetness, percs slowly, flooding.	Wetness, percs slowly.	Wetness, percs slowly.
WT*---- Winton	Severe: slope.	Severe: seepage.	Deep to water	Slope----	Slope----	Slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
AtA---------- Altavista	0-10	Fine sandy loam	ML, CL-ML, SM, SM-SC	A-4	0	95-100	90-100	65-99	35-60	<23	NP-7
	10-50	Clay loam, sandy clay loam, sandy loam.	CL, CL-ML, SC, SM-SC	A-4, A-6, A-7	0	95-100	95-100	60-99	45-75	20-45	5-28
	50-60	Variable---------	---	---	0	---	---	---	---	---	---
AuB---------- Autryville	0-23	Loamy sand-------	SP-SM, SM	A-2, A-3	0	100	100	50-100	5-20	---	NP
	23-40	Sandy loam, sandy clay loam, fine sandy loam.	SM	A-2	0	100	100	50-100	15-30	<25	NP-3
	40-55	Sand, loamy sand, loamy fine sand.	SP-SM, SM	A-2, A-3	0	100	100	50-100	5-20	---	NP
	55-80	Sandy loam, sandy clay loam, fine sandy loam.	SM, SC, SM-SC	A-2, A-4	0	100	100	60-100	20-49	<30	NP-10
BB*---------- Bibb	0-8	Loam----------	ML, CL-ML	A-4	0-5	95-100	90-100	80-90	50-80	<25	NP-7
	8-61	Sandy loam, loamy sand.	SM, SM-SC,	A-2, A-4	0-10	60-100	50-100	40-100	30-49	<30	NP-7
BoB, BoC--------- Bonneau	0-24	Loamy sand-------	SM	A-2	0	100	100	50-80	15-35	---	NP
	24-63	Sandy loam, sandy clay loam, fine sandy loam.	SC, SM-SC	A-2, A-6, A-4	0	100	100	60-90	30-50	21-37	4-14
CaA, CaB--------- Caroline	0-8	Fine sandy loam	SM, ML, CL-ML, SM-SC	A-2, A-4	0	90-100	85-100	60-85	30-55	<25	NP-5
	8-62	Clay loam, clay, silty clay.	CL, CH	A-7	0	90-100	85-100	80-100	60-90	41-70	18-40
CoB---------- Conetoe	0-24	Loamy sand-------	SM, SP-SM	A-2, A-3	0	100	100	50-95	5-30	---	NP
	24-39	Sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4	0	100	100	50-95	20-40	<30	NP-10
	39-68	Loamy sand, sand	SM, SP, SP-SM	A-2, A-3, A-1	0	100	100	40-95	4-30	---	NP
CrA, CrB, CrC2--- Craven	0-7	Fine sandy loam	ML, CL-ML, SM, SM-SC	A-4	0	100	100	75-100	45-90	<35	NP-7
	7-52	Clay, silty clay, silty clay loam.	CH	A-7	0	100	100	90-100	65-98	51-70	24-43
	52-62	Sandy clay loam, clay loam, loamy sand.	SM, SM-SC, SC	A-2, A-4, A-6	0	100	95-100	50-100	15-49	<35	NP-15
CrD2---------- Craven	0-3	Fine sandy loam	ML, CL-ML, SM, SM-SC	A-4	0	100	100	75-100	45-90	<35	NP-7
	3-51	Clay, silty clay, silty clay loam.	CH	A-7	0	100	100	90-100	65-98	51-70	24-43
	51-65	Sandy clay loam, sandy loam, loamy sand.	SM, SM-SC, SC	A-2, A-4, A-6	0	100	95-100	50-100	15-49	<35	NP-15
CsA*: Craven----------	0-7	Fine sandy loam	ML, CL-ML, SM, SM-SC	A-4	0	100	100	75-100	45-90	<35	NP-7
	7-52	Clay, silty clay, silty clay loam.	CH	A-7	0	100	100	90-100	65-98	51-70	24-43
	52-62	Sandy clay loam, sandy loam, loamy sand.	SM, SM-SC, SC	A-2, A-4, A-6	0	100	95-100	50-100	15-49	<35	NP-15
Urban land.											
DO*---------- Dorovan	0-6	Mucky peat-------	PT	---	0	---	---	---	---	---	---
	6-70	Muck----------	PT	---	0	---	---	---	---	---	---
	70-85	Sand, fine sand, loam.	SP-SM, SM-SC, SM	A-1, A-3, A-4, A-2-4	0	100	100	5-70	5-49	<20	NP-7

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
ExA---------- Exum	0-8	Very fine sandy loam.	ML, CL-ML, CL	A-4	0	100	95-100	80-100	51-80	<25	NP-10
	8-62	Loam, silty clay loam, silty clay	CL	A-4, A-6, A-7	0	100	95-100	90-100	60-90	22-49	8-30
GoA---------- Goldsboro	0-7	Fine sandy loam	SM, SM-SC, SC	A-2, A-4, A-6	0	90-100	75-100	50-95	15-45	<25	NP-14
	7-62	Sandy clay loam, sandy loam.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6	0	98-100	95-100	60-95	25-55	16-37	4-18
GpA*: Goldsboro-------	0-7	Fine sandy loam	SM, SM-SC, SC	A-2, A-4, A-6	0	90-100	75-100	50-95	15-45	<25	NP-14
	7-62	Sandy clay loam, sandy loam.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6	0	98-100	95-100	60-95	25-55	16-37	4-18
Urban land.											
LF*---------- Leaf	0-4	Loam----------	ML, CL	A-4, A-6	0	100	95-100	70-100	50-90	30-40	5-15
	4-62	Silty clay loam, silty clay, clay.	CL, CH	A-7	0	100	95-100	90-100	75-95	42-65	20-38
Ln---------- Lenoir	0-6	Loam----------	ML, CL, CL-ML	A-4	0	100	100	85-95	60-85	<35	<10
	6-65	Clay, silty clay, clay loam.	CL, CH	A-6, A-7	0	100	100	85-95	55-95	30-55	11-35
Ly---------- Lynchburg	0-10	Fine sandy loam	SM, ML, SM-SC, CL-ML	A-2, A-4	0	92-100	90-100	75-100	25-55	<30	NP-7
	10-62	Sandy clay loam, sandy loam, clay loam.	SM-SC, SC, CL, CL-ML	A-2, A-4, A-6	0	92-100	90-100	70-100	25-67	15-40	4-18
NoA, NoB, NoC---- Norfolk	0-17	Loamy fine sand	SM	A-2	0	95-100	92-100	50-91	13-30	<20	NP
	17-68	Sandy loam, sandy clay loam, clay loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0	95-100	91-100	70-96	30-55	20-38	4-15
Ra---------- Rains	0-9	Fine sandy loam	SM, ML	A-2, A-4	0	100	95-100	50-85	25-56	<35	NP-10
	9-62	Sandy clay loam, clay loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	0	100	95-100	55-98	30-70	18-40	4-20
Ro---------- Roanoke	0-7	Loam----------	SM-SC, CL-ML, CL, SC	A-6, A-4	0	95-100	85-100	60-100	35-90	20-35	5-16
	7-55	Clay, sandy clay loam, clay loam.	CH, CL	A-7	0	90-100	85-100	85-100	65-95	45-70	22-40
	55-62	Variable---------	---	---	---	---	---	---	---	---	---
RuA---------- Rumford	0-14	Loamy sand-------	SM	A-2, A-1	0	90-100	85-100	45-75	15-30	<20	NP
	14-38	Fine sandy loam, sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	80-100	75-100	55-85	30-50	<34	NP-12
	38-63	Stratified sandy loam to gravelly sand.	SM, SP, GP, GM	A-1, A-2, A-3, A-4	0	50-100	35-100	20-85	2-40	<25	NP-6
Se---------- Seabrook	0-8	Loamy sand-------	SM, SP-SM	A-2, A-3	0	95-100	90-100	85-99	5-25	---	NP
	8-81	Loamy fine sand, fine sand, sand.	SM, SP-SM	A-2, A-3	0	95-100	90-100	85-100	5-25	---	NP

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
TaB---------- Tarboro	0-40	Sand----------	SM, SP-SM, SW-SM	A-2, A-3, A-1	0	95-100	85-100	40-99	8-35	---	NP
	40-85	Sand, coarse sand, loamy sand.	SP, SP-SM, SW-SM, SM	A-2, A-3, A-1	0	95-100	90-100	45-100	3-15	---	NP
To---------- Tomotley	0-15	Fine sandy loam	SM	A-2, A-4	0	98-100	95-100	75-98	25-50	<30	NP-7
	15-35	Fine sandy loam, sandy clay loam, clay loam.	SM-SC, SC, CL-ML, CL	A-2, A-4, A-6	0	98-100	95-100	75-98	30-70	20-40	6-18
	35-44	Sandy loam, sandy clay loam, sandy clay.	SM-SC, SC, CL-ML, CL	A-4, A-6, A-7	0	98-100	95-100	75-98	36-75	20-45	6-22
	44-60	Variable---------	---	---	---	---	---	---	---	---	---
Ud. Udorthents											
WaB---------- Wakulla	0-26	Sand----------	SP, SP-SM	A-3	0	100	100	60-90	4-10	---	NP
	26-39	Loamy sand, loamy fine sand.	SM, SP-SM	A-2	0	100	100	55-85	10-25	---	NP
	39-72	Sand, fine sand, coarse sand.	SM, SP-SM	A-2, A-3	0	100	100	50-70	5-15	---	NP
We---------- Wehadkee	0-15	Silt loam--------	CL, MH, ML	A-6, A-7	0	100	98-100	85-100	51-98	30-58	10-24
	15-61	Loam, silty clay loam, clay loam.	ML, CL, CL-ML	A-6, A-7, A-4	0	100	99-100	85-100	51-85	25-45	7-20
WkA, WkB--------- Wickham	0-15	Sandy loam-------	SM, SM-SC, ML, CL-ML	A-4	0	95-100	90-100	70-100	45-80	<25	NP-7
	15-43	Sandy clay loam, clay loam, loam.	CL-ML, CL, SC, SM-SC	A-2, A-4, A-6,	0	95-100	90-100	75-100	30-70	20-41	5-15
	43-67	Variable---------	---	---	---	---	---	---	---	---	---
WN*---------- Wilbanks	0-5	Silty clay loam	ML, CL-ML, CL	A-4	0	100	100	70-100	51-98	20-46	6-20
	5-50	Silty clay, clay, clay loam.	CH, MH	A-7	0	100	100	90-100	75-95	45-65	18-35
	50-64	Variable---------	---	---	---	---	---	---	---	---	---
WT*---------- Winton	0-4	Fine sandy loam	ML, SM	A-2, A-4, A-6	0-3	90-100	90-100	50-99	15-35	25	NP-15
	4-35	Sandy clay loam, sandy loam, clay loam.	SC, CL	A-2, A-4, A-6, A-7	0-2	90-100	80-100	45-95	25-70	20-35	5-28
	35-62	Variable---------	---	---	---	---	---	---	---	---	---

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	G/cm³	In/hr	In/in	pH					Pct
AtA Altavista	0-10 10-50 50-60	10-24 18-35 ---	1.30-1.50 1.30-1.50 ---	2.0-6.0 0.6-2.0 ---	0.12-0.20 0.12-0.20 ---	4.5-6.0 4.5-6.0 ---	Low Low ---	0.24 0.24 ---	5	---	.5-3
AuB Autryville	0-23 23-40 40-55 55-80	2-10 10-25 2-8 10-35	1.60-1.70 1.40-1.60 1.60-1.70 1.40-1.60	>6.0 2.0-6.0 >6.0 0.6-2.0	0.04-0.09 0.08-0.13 0.03-0.08 0.10-0.15	4.5-6.5 4.5-5.5 4.5-5.5 4.5-5.5	Low Low Low Low	0.10 0.10 0.10 0.17	5	---	.5-1
BB* Bibb	0-8 8-61	2-18 2-18	--- ---	0.6-2.0 0.6-2.0	0.15-0.20 0.12-0.20	4.5-5.5 4.5-5.5	Low Low	0.28 0.37	5	---	.5-2
BoB, BoC Bonneau	0-24 24-63	5-15 18-35	1.30-1.70 1.40-1.60	6.0-20 0.6-2.0	0.05-0.11 0.10-0.15	4.5-6.0 4.5-5.5	Low Low	0.15 0.20	5	2	.5-2
CaA, CaB Caroline	0-8 8-62	10-20 35-55	1.35-1.45 1.40-1.50	0.6-6.0 0.06-0.6	0.08-0.15 0.14-0.22	3.6-5.5 3.6-5.5	Low Moderate	0.43 0.32	5	4	.5-2
CoB Conetoe	0-24 24-39 39-68	2-10 10-22 2-10	1.60-1.75 1.40-1.60 1.60-1.75	6.0-20 2.0-6.0 6.0-20	0.05-0.10 0.10-0.15 0.05-0.10	4.5-6.0 4.5-6.0 4.5-6.0	Low Low Low	0.15 0.15 0.10	5	---	.5-2
CrA, CrB, CrC2 Craven	0-7 7-52 52-62	6-20 35-60 5-35	1.30-1.55 1.30-1.45 1.35-1.60	0.6-2.0 0.06-0.2 0.2-6.0	0.12-0.18 0.12-0.15 0.08-0.14	4.5-6.5 3.6-5.5 3.6-5.5	Low Moderate Low	0.37 0.32 0.32	5	---	.5-2
CrD2 Craven	0-3 3-51 51-65	6-20 35-60 5-35	1.30-1.55 1.30-1.45 1.35-1.60	0.6-2.0 0.06-0.2 0.2-6.0	0.12-0.18 0.12-0.15 0.08-0.14	4.5-6.5 3.6-5.5 3.6-5.5	Low Moderate Low	0.37 0.32 0.32	5	---	.5-2
CsA*: Craven	0-7 7-52 52-62	6-20 35-60 5-35	1.30-1.55 1.30-1.45 1.35-1.60	0.6-2.0 0.06-0.2 0.2-6.0	0.12-0.18 0.12-0.15 0.08-0.14	4.5-6.5 3.6-5.5 3.6-5.5	Low Moderate Low	0.37 0.32 0.32	5	---	.5-2
Urban land.											
DO* Dorovan	0-6 6-70 70-85	--- --- 5-20	0.25-0.40 0.35-0.55 1.40-1.65	0.6-2.0 0.6-2.0 6.0-20	0.25-0.50 0.25-0.50 0.05-0.08	3.6-4.4 3.6-4.4 4.5-5.5	--- --- Low	--- --- ---	---	---	---
ExA Exum	0-8 8-62	6-18 18-35	1.30-1.50 1.30-1.40	2.0-6.0 0.2-0.6	0.15-0.20 0.15-0.20	4.5-6.0 4.5-5.5	Low Low	0.37 0.37	5	---	.5-2
GoA Goldsboro	0-7 7-62	5-15 18-30	1.40-1.60 1.30-1.50	2.0-6.0 0.6-2.0	0.08-0.12 0.11-0.15	4.5-6.0 4.5-5.5	Low Low	0.20 0.24	5	---	.5-2
GpA*: Goldsboro	0-7 7-62	5-15 18-30	1.40-1.60 1.30-1.50	2.0-6.0 0.6-2.0	0.08-0.12 0.11-0.15	4.5-6.0 4.5-5.5	Low Low	0.20 0.24	5	---	.5-2
Urban land.											
LF* Leaf	0-4 4-62	12-25 35-60	1.30-1.50 1.50-1.60	0.06-0.2 <0.06	0.20-0.22 0.18-0.21	3.6-5.5 3.6-5.5	Low High	0.32 0.32	4	---	1-3
Ln Lenoir	0-6 6-65	6-20 35-60	1.30-1.50 1.20-1.35	0.6-2.0 0.06-0.2	0.14-0.18 0.13-0.15	4.5-5.5 4.5-5.5	Low Moderate	0.37 0.32	5	---	2-4
Ly Lynchburg	0-10 10-62	5-20 18-35	1.30-1.60 1.30-1.50	2.0-6.0 0.6-2.0	0.09-0.13 0.12-0.16	3.6-5.5 3.6-5.5	Low Low	0.20 0.20	5	3	.5-5

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	G/cm³	In/hr	In/in	pH					Pct
NoA, NoB, NoC----	0-17	2-8	1.55-1.75	6.0-20	0.06-0.11	4.5-6.0	Low----------	0.20	5	---	.5-2
Norfolk	17-68	18-35	1.35-1.45	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.24			
Ra----------	0-9	5-20	1.30-1.60	2.0-6.0	0.08-0.12	4.5-6.5	Low----------	0.20	5	3	1-6
Rains	9-62	18-35	1.30-1.50	0.6-2.0	0.10-0.15	4.5-5.5	Low----------	0.24			
Ro----------	0-7	10-27	1.20-1.50	0.6-2.0	0.14-0.20	4.5-5.5	Low----------	0.37	4	---	.5-3
Roanoke	7-55	35-60	1.35-1.65	0.06-0.2	0.10-0.19	4.5-5.5	Moderate------	0.24			
	55-62	---	---	---	---	---	----------	----			
RuA----------	0-14	2-12	1.25-1.45	>6.0	0.06-0.10	3.6-5.5	Low----------	0.17	4	2	.5-1
Rumford	14-38	8-18	1.25-1.45	2.0-6.0	0.10-0.15	3.6-6.0	Low----------	0.17			
	38-63	2-18	1.25-1.50	>2.0	0.04-0.10	3.6-6.5	Low----------	0.17			
Se----------	0-8	2-12	1.30-1.60	6.0-20	0.05-0.11	4.5-6.5	Low----------	0.10	5	2	.5-2
Seabrook	8-81	2-12	1.30-1.60	6.0-20	0.02-0.09	4.5-6.5	Low----------	0.10			
TaB----------	0-40	3-12	1.60-1.75	6.0-20	0.05-0.09	5.1-6.5	Low----------	0.10	5	---	.5-1
Tarboro	40-85	2-7	1.60-1.75	>20	0.02-0.06	5.1-6.5	Low----------	0.10			
To----------	0-15	5-20	1.30-1.60	2.0-6.0	0.10-0.15	3.6-5.5	Low----------	0.20	5	3	1-6
Tomotley	15-35	18-35	1.30-1.50	0.6-2.0	0.12-0.18	3.6-5.5	Low----------	0.20			
	35-44	15-45	1.30-1.60	0.2-2.0	0.12-0.18	3.6-6.0	Low----------	0.20			
	44-60	---	---	---	---	---	----------	----			
Ud. Udorthents											
WaB----------	0-26	5-12	1.45-1.60	6.0-20	<0.05	4.5-6.0	Low----------	0.10	5	---	.5-1
Wakulla	26-39	2-8	1.45-1.60	6.0-20	0.05-0.10	4.5-6.0	Low----------	0.10			
	39-72	2-8	1.45-1.60	6.0-20	<0.05	4.5-6.0	Low----------	0.10			
We----------	0-15	15-40	1.35-1.50	0.6-2.0	0.15-0.24	4.5-6.5	Low----------	0.32	5	---	2-5
Wehadkee	15-61	18-35	1.30-1.50	0.6-2.0	0.16-0.20	4.5-6.5	Low----------	0.32			
WkA, WkB----------	0-15	8-15	1.45-1.65	2.0-6.0	0.11-0.16	4.5-6.0	Low----------	0.24	5	---	.5-2
Wickham	15-43	18-25	1.30-1.40	0.6-2.0	0.12-0.17	4.5-6.0	Low----------	0.24			
	43-67	---	---	---	---	---	----------	----			
WN*----------	0-5	5-25	1.35-1.55	0.6-2.0	0.11-0.20	3.6-5.5	Low----------	0.20	5	---	2-5
Wilbanks	5-50	35-55	1.40-1.50	0.06-0.6	0.15-0.22	3.6-5.5	Moderate------	0.24			
	50-64	---	---	---	---	---	----------	----			
WT*----------	0-4	7-27	1.30-1.40	2.0-6.0	0.12-0.20	4.5-6.0	Low----------	0.20	4	---	.5-3
Winton	4-35	18-35	1.30-1.50	0.2-2.0	0.12-0.20	4.5-6.0	Low----------	0.24			
	35-62	---	---	---	---	---	----------	----			

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol > means more than. Absence of an entry indicates that the feature is not a concern]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Risk of corrosion	
		Frequency	Duration	Months	Depth*	Kind	Months	Uncoated steel	Concrete
					Ft				
AtA---- Altavista	C	Rare----	---	---	1.5-2.5	Apparent	Dec-Mar	Moderate	Moderate.
AuB---- Autryville	A	None----	---	---	4.0-6.0	Apparent	Jan-Apr	Low----	High.
BB**---- Bibb	C	Common----	Brief----	Dec-May	0.5-1.5	Apparent	Dec-Apr	High----	Moderate.
BoB, BoC---- Bonneau	A	None----	---	---	3.5-5.0	Apparent	Dec-Mar	Low----	High.
CaA, CaB---- Caroline	C	None----	---	---	>6.0	---	---	High----	High.
CoB---- Conetoe	A	Rare----	---	---	>6.0	---	---	Low----	High.
CrA, CrB, CrC2, CrD2---- Craven	C	None----	---	---	2.0-3.0	Apparent	Dec-Apr	High----	High.
CsA**: Craven----	C	None----	---	---	2.0-3.0	Apparent	Dec-Apr	High----	High.
Urban land.									
DO**---- Dorovan	D	Common----	Very long	Jan-Dec	+1-0.5	Apparent	Jan-Dec	High----	High.
ExA---- Exum	C	None----	---	---	2.0-3.0	Apparent	Dec-Apr	Moderate	High.
GoA---- Goldsboro	B	None----	---	---	2.0-3.0	Apparent	Dec-Apr	Moderate	High.
GpA**: Goldsboro----	B	None----	---	---	2.0-3.0	Apparent	Dec-Apr	Moderate	High.
Urban land.									
LF**---- Leaf	D	None----	---	---	0.5-1.5	Apparent	Jan-Apr	High----	Moderate.
Ln---- Lenoir	D	None----	---	---	1.0-2.5	Apparent	Dec-May	High----	High.
Ly---- Lynchburg	C	None----	---	---	0.5-1.5	Apparent	Nov-Apr	High----	High.
NoA, NoB, NoC---- Norfolk	B	None----	---	---	4.0-6.0	Apparent	Jan-Mar	Moderate	High.
Ra---- Rains	B/D	None----	---	---	0-1.0	Apparent	Nov-Apr	High----	High.
Ro---- Roanoke	D	Rare----	---	---	0-1.0	Apparent	Nov-May	High----	High.
RuA---- Rumford	B	None----	---	---	>6.0	---	---	Low----	High.

See footnote at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Risk of corrosion	
		Frequency	Duration	Months	Depth*	Kind	Months	Uncoated steel	Concrete
					Ft				
Se---------- Seabrook	C	Rare--------	---	---	2.0-4.0	Apparent	Dec-Mar	Low-------	Moderate.
TaB---------- Tarboro	A	Rare--------	---	---	>6.0	---	---	Low-------	Moderate.
To---------- Tomotley	B/D	Rare--------	---	---	0-1.0	Apparent	Dec-Mar	High------	High.
Ud. Udorthents									
WaB---------- Wakulla	A	None--------	---	---	>6.0	---	---	Low-------	High.
We---------- Wehadkee	D	Common-------	Brief------	Nov-Jun	0-2.5	Apparent	Dec-May	High------	Moderate.
WkA, WkB---------- Wickham	B	Rare--------	---	---	>6.0	---	---	Moderate	High.
WN**---------- Wilbanks	D	Frequent-----	Brief------	Nov-Mar	0-1.0	Apparent	Nov-Mar	High------	High.
WT**---------- Winton	C	None--------	---	---	2.0-4.0	Perched	Dec-May	Moderate	Moderate.

* In the "High water table--Depth" column, a plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

** See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Altavista	Fine-loamy, mixed, thermic Aquic Hapludults
Autryville	Loamy, siliceous, thermic Arenic Paleudults
Bibb	Coarse-loamy, siliceous, acid, thermic Typic Fluvaquents
Bonneau	Loamy, siliceous, thermic Arenic Paleudults
Caroline	Clayey, mixed, thermic Typic Paleudults
Conetoe	Loamy, mixed, thermic Arenic Hapludults
Craven	Clayey, mixed, thermic Aquic Hapludults
Dorovan	Dysic, thermic Typic Medisaprists
Exum	Fine-silty, siliceous, thermic Aquic Paleudults
Goldsboro	Fine-loamy, siliceous, thermic Aquic Paleudults
Leaf	Clayey, mixed, thermic Typic Albaquults
Lenoir	Clayey, mixed, thermic Aeric Paleaquults
Lynchburg	Fine-loamy, siliceous, thermic Aeric Paleaquults
Norfolk	Fine-loamy, siliceous, thermic Typic Paleudults
Rains	Fine-loamy, siliceous, thermic Typic Paleaquults
Roanoke	Clayey, mixed, thermic Typic Ochraquults
Rumford	Coarse-loamy, siliceous, thermic Typic Hapludults
Seabrook	Mixed, thermic Aquic Udipsamments
Tarboro	Mixed, thermic Typic Udipsamments
Tomotley	Fine-loamy, mixed, thermic Typic Ochraquults
Wakulla	Sandy, siliceous, thermic Psammentic Hapludults
*Wehadkee	Fine-loamy, mixed, nonacid, thermic Typic Fluvaquents
Wickham	Fine-loamy, mixed, thermic Typic Hapludults
Wilbanks	Fine, mixed, acid, thermic Cumulic Humaquepts
Winton	Fine-loamy, mixed, thermic Aquic Hapludults

* The soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series.

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