

## *Woodland Uses of the Soils<sup>4</sup>*

This section contains a brief description of the forests of Pitt County and provides information concerning the relationship between soils and trees. To make the soil survey more useful to landowners and managers, who develop and harvest woodland resources, interpretations are given for use of the soils as woodland.

### **Woodland resources**

All of the area that is now Pitt County was originally in forest that consisted of many kinds of needle-leaved and broad-leaved trees. On the better drained, nearly level or undulating soils of interstream uplands, the trees were mainly longleaf, loblolly, and some shortleaf pines; white, southern, red, black, and post oaks; and hickory, yellow-poplar, sweetgum, sourwood, dogwood, and American holly. On the more poorly drained soils of the uplands, the trees were mainly sweetgum and blackgum; white, water, and willow oaks; and yellow-poplar, red maple, holly, and some pines. On the very poorly drained soils of Grindle Pocosin and other flat or depressed areas of the uplands, pond and loblolly pines and swamp tupelo, cypress, red maple, sweetgum, sweetbay, and red bay competed with a rank growth of swamp ironwood (titi), zenobia, fetterbush, and switchcane.

The principal kinds of trees growing on the deep sands and loamy sands that occur in rather large areas were longleaf pine and an understory of blackjack and other scrub oaks. Yellow-poplar and sycamore; water, willow, white, and swamp chestnut oaks; and cottonwood, ash, elm, persimmon, and river birch grew on the better drained soils of the flood plains along the Tar River and other major streams. Trees growing in swamps and along creeks were mainly baldcypress, water tupelo, swamp tupelo, Carolina (water) ash, and red maple.

Commercial forests now occupy 216,400 acres (10), or about 51.5 percent of the land area of Pitt County. They are among the most valuable of the natural resources. About 99.3 percent of the land in forest is privately owned, mostly by farmers. Much of this land is in tracts of less than 100 acres.

### **Rating soils for woodland use**

All the soils of Pitt County except Swamp have been rated on the basis of their capability and suitability for producing wood crops. The ratings are based on measurements by foresters and soil scientists, on results of pertinent research, and on the experience of foresters and managers of wooded areas. These ratings are a means of expressing information useful in managing soils for woodland purposes. Soil-related elements of tree growth and management that are important in Pitt County are discussed in the following paragraphs.

Potential productivity of the soils is determined by site index for a given species of tree. The site index is the average of the measured total height, in feet, of the dominant and codominant trees in an even-aged stand when the trees attain the age of 50 years. By using published results of research, site index can be converted to expected yields (4,7). In [table 3](#) potential productivity is expressed by site class, which values were obtained by rounding the site index for each species of tree to the nearest 10-foot interval. Site class for some broad-leaved trees was determined through comparison with similar trees growing on the same kind of soil.

In [table 3](#) preferred species of trees are shown by listing the names of the principal commercial species of trees that should be favored in existing stands and those that are suitable for planting. The preferred species of trees were selected on the basis of their rate of growth and on the quality, value, and general marketability of the products obtained from them.

Ratings are also given in [table 3](#) for the hazard of erosion, equipment restrictions, and seedling mortality. Windthrow is not generally considered a hazard in Pitt County, except when the velocity of the wind is abnormally high, as during a hurricane.

The hazard of erosion is rated as *slight, moderate, or severe*. The ratings are based on the erodibility and thickness of the particular soil and on steepness of the slope.

Equipment restrictions are determined on the basis of physical characteristics of the soils on topographic features that restrict or prohibit the use of equipment commonly used in constructing access roads, harvesting forest products, controlling undesirable vegetation and fire, or other operations required for managing wooded areas. Excess water, a high content of clay in the upper part of the soil profile, and coarse texture of the surface layer are the chief factors that restrict use of equipment needed for managing wooded areas in Pitt County. Ratings for equipment restrictions have the following meanings:

A rating of *slight* means that conventional equipment may be used at any time during the year, except for short periods of heavy rainfall; drainage is moderate to excessive; the soils are not subject to flooding or excessive ponding; and slopes are less than 15 percent. A rating of *moderate* means that conventional equipment can be used from March to December; occasional flooding may occur; the water level is generally below the surface for extended periods; and slopes are less than 25 percent. A rating of *severe* means that conventional equipment can be used only during the driest months or between periods of flooding, or that slopes exceed 25 percent.

Seedling mortality refers to the expected degree of loss of tree seedlings of preferred species established by planting, direct seeding, or natural seeding, as a result of unfavorable soil characteristics of topographic features. The evaluation of seedling mortality is based on the assumption that plant competition is not a limiting factor; that healthy seedlings of a suitable grade have been properly planted; that an adequate source of seed is available where natural seeding is expected; and that planted or natural seedlings have a normal environment. The rating is *slight* if seedling mortality does not exceed 25 percent. A rating of *moderate* indicates that losses of seedlings will be between 25 and 50 percent. A rating of *severe* means that more than 50 percent of the seedlings are likely to die.

### **Woodland suitability grouping of soils**

Rating individual soils according to their potential productivity, the preferred species of trees, and the hazards or other factors that affect management, provides a basis for grouping soils according to their suitability for woodland use and management. A woodland suitability group consists of soils that have comparable potential productivity and similar limitations, that are used to produce similar wood crops, and that require about the same kind of management. [Table 3](#) provides a description of soils in each woodland suitability group and gives information about potential productivity, species of trees preferred for management and for planting, and hazards and other factors that affect management.

Symbols consisting of three elements identify each woodland suitability group. The first element in the symbol is Arabic numeral that refers to the relative productivity potential of the soils in the group. It expresses site quality based on one or more commercially important species of forest trees. The numeral 1 indicates that the soil has a very high potential productivity; 2 indicates that the soil has high potential productivity; 3, that the soil has moderately high potential productivity; 4, that the soil has moderate potential productivity; and 5, that the soil has low potential productivity.

The second element in the symbol is a lowercase letter that indicates the soil property or physiographic characteristic that is the primary cause of hazards, limitations, or restrictions of the soils woodland use and management. The letter "w" indicates excessive soil wetness. Soils that have this designation are those in which excess water, either seasonal or year long, causes the significant limitations for woodland use (fig. 5). Such soils have restricted drainage, have a seasonal water table, or are subject to flooding; and the excess water adversely affects the development of the stand, or it adversely affects management.

The letter “c” indicates that management restrictions or limitations are caused primarily by the kind or amount of clay in the upper part of the soil profile. Soils that have this designation have little or no textural B-horizon, have low available water capacity, and generally are low in available plant nutrients. The high content of sand may also impose restrictions on the use of equipment. The letter “o” indicates that there are no significant soil-related problems.

Some soils have more than one limiting characteristic. For those soils, priority was assigned in the order that the foregoing characteristics are described.

The third element in the symbol is Arabic numeral that indicates the degree of hazards or limitations and the general suitability of the soils for certain kinds of trees. The numeral 1 indicates that the soils have no significant management limitations and that they are better suited to needle-leaved trees to broad-leaved trees. The numeral 2 indicates that the soils have slight or moderate limitations and that they are better suited to needle-leaved trees than to broad-leaved trees. The numeral 7 indicates that the soils have no significant limitations or restrictions that affect management and that they are well suited to either needle-leaved or broad-leaved trees. The numeral 8 indicates that the soils have slight or moderate limitations that affect management and that they are well suited to either needle-leaved or broad-leaved trees (fig 6). The numeral 9 indicates that the soils have moderate or severe limitations and that they are suitable for either needle-leaved or broad-leaved trees.

The woodland suitability group for each soil mapping unit can be determined by referring to the “Guide to Mapping Units” at the end of this survey.

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