FORESTLAND INTERPRETATIONS

The following "Guides to Suitable Soils for Wood Crops" contain interpretations of soils for producing wood crops. Only those soils with the best potential of producing a wood crop (excluding Christmas trees) are included in these guides. This information provides currently available knowledge about these soils as they relate to establishment, growth, management, and harvesting of wood crops.

This information is intended as an aid when considering land use alternatives in a conservation plan. It also provides management and establishment considerations for those areas designated as WOODLAND. As a general rule, a soil with a site index of 55 or less is considered noncommercial, or not economically suited for commercial production of wood products. Other values, however, such as erosion and flood control, beautification, recreation, wildlife, etc., may make this type of land suited for woodland.

Column 1 (Name of Soil)

The common phases of soil series are listed. Where significant difference in productivity, species suitability, or management problems exist among phases of the same series, these phases are listed and rated separately.

Column 2 (Ordination Symbol)

The ordination system is designed to provide a uniform system of labeling individual soils so as to make immediately evident the productivity potential and the principal soil properties associated with any hazards or limitations which might be related.

The first element of the symbol denotes potential productivity in terms of cubic meters of wood per hectare per year for an indicator tree species. A mean annual increment of one m^3/ha (cubic meter per hectare) equals 14.3 $ft.^3$/2c. (14.3 cubic feet per acre).

e.g., 1 means 1 cubic meter per hectare per year
2 means 2 cubic meters per hectare per year
10 means 10 cubic meters per hectare per year

The second element in the symbol indicates the suitability subclass. It expresses selected soil properties that cause moderate to severe hazards or limitations in woodland use or management, by one of the following lower case Arabic letters:

Subclass w (excessive wetness)

Soils in which excessive water, whether seasonally or yearlong, causes significant limitations for woodland use or management. These soils have restricted drainage, high water tables, or over-flow hazards which adversely affect either stand development or management.

Subclass d (restricted rooting depth)

Soils with restrictions or limitations for woodland use or management due to restricted rooting depths. Shallow soils having bedrock within 25 inches of the surface are in this subclass.

Subclass c (clayey soils)

Soils having restrictions or limitations for woodland use or management due to the kind or amount of clay in the upper portion of the soil profile. Soils with clay or silty clay textures within the upper 20 inches are in this subclass.

Subclass s (sandy soils)

Dry sandy soils with little or no textural subhorizons and loamy textured soils that are less than 20 inches thick over sand or gravel having restrictions or limitations for woodland use or management. These soils have low available water capacity and normally are low in available plant nutrients.

Subclass 0 (slight or no restrictions)

Soils with no significant restrictions or limitations for woodland use or management.

Subclass r (relief or slope steepness)

Soils with restrictions or limitations for woodland use or management due only to steepness of slope. Soils on slopes greater than 15 percent are in this subclass.

Column 3 (Erosion Hazard)

Listed is the potential erosion hazard of the soil in woodland use following cutting operations, or where the soil is exposed along roads, trails, or firebreaks. A rating of slight indicates that problems of erosion control are unimportant. A rating of moderate indicates some attention must be given to prevent unnecessary soil erosion. A rating of severe indicates that intensive treatments or special equipment and methods of operation should be planned to minimize soil erosion. The potential erosion hazard is based on slope, soil depth, erodibility, and soil loss tolerance.

Column 4 (Equipment Limitation)

This is the evaluation of equipment restrictions. Ratings reflect limitations in the use of equipment for managing or harvesting the tree crop. A rating of slight indicates equipment use is seldom limited in kind or time of year. A rating of moderate indicates a need for modified equipment or seasonal restrictions due to slope, stones, obstructions, soil wetness, flooding, or overflow. A rating of severe indicates the need for specialized equipment due to one or more of the factors listed above.

Column 5 (Seedling Mortality)

The degree of expected seedling mortality during the first two growing seasons after planting or seeding is indicated. Normal rainfall, adequate site preparation, good planting stock, proper planting methods, and appropriate protection and cultivation are assumed. A rating of severe indicates that unsatisfactory survival on less than 25 percent of the area is likely. A rating of moderate indicates that unsatisfactory survival is likely on 25 to 50 percent of the area planted. A rating of severe indicates that unsatisfactory survival is likely on more than 50 percent of the area.

Column 6 (Windthrow Hazard)

Windthrow hazard is rated here. It is the potential danger of trees being blown over by the wind. Effective rooting depth of a particular soil is important in determining this hazard. A rating of slight indicates that normally there are no trees blown down by the wind. A rating of moderate indicates some trees are expected to blow down during periods of excessive soil wetness and high wind. A rating of severe indicates that many trees are expected to blow down during periods of soil wetness with moderate or high winds.

Column 7 (Plant Competition)

This is the rating for plant competition which occurs when openings are made in the canopy. This rating of competition is for invasion or growth of undesirable plant growth that interferes with regeneration of desirable species. A rating of slight indicates com-petition will not prevent adequate natural regeneration and early growth or interfere with adequate development of planted seedlings. A rating of moderate indicates competition will delay natural or artificial regeneration, both establishment and growth rate, but will not prevent the eventual development of fully stocked normal stands. A rating of severe indicates competition will prevent adequate natural or artificial regeneration without intensive site preparation and maintenance treatments such as weeding.

Column 8 (Common Trees)

Listed are some of the commercially important tree species which are adapted to the soil listed in column one. These are the tree species which woodland managers generally favor in intermediate or improvement cuttings, after considering the form and vigor of individual trees. Priority between species is influenced by local marketability and the owner's objectives, as well as by growth rates, values, and the quality of wood products from a given species.

Column 9 (Site Index)

Listed is the average site index for the most important species listed in column eight. Entries in this column marked with an asterisk are an estimate based on site index of the same species on a similar soil, or by comparison with another species on the same soil. Site index 1/ is the average height of dominant trees at age 30 for cotton-woods, age 50 for all other hardwoods, and age 100 for ponderosa pine in the Niobrara River and Pine Ridge areas.

Column 10 (Trees to Plant)

Listed are several suitable tree species for planting on the soil named in column one. The list may include some species which do not normally occur in native stands on the designated soil or in this physiographic area, as well as some of the important species listed in column eight.

1/ Site index for eastern cottonwood is based on Field Guide for Evaluating Cottonwood Sites, Southern Forest Experiment Station Occasional Paper, by Broadfoot, W.M., 1960.

Site index for black walnut is based on Site Index Curves for Black Walnut, Central States, Central States Forest Experiment Station Technical Note No. 35, by Kellogg, L.F., 1939.

Site index for bur oak and hackberry is based on Yield, Stand, and Volume Tables for Even-Aged Upland Oak Forests, USDA Technical Bulletin 560, by Schnur, G. L., 1937.

Site index for red oak and basswood is based on Site Index Curves for Red Oak in The Lake States, Lake States Forest Experiment Station Technical Note 485, by Gevorkiantz, S. R., 1957.

Site index for ponderosa pine is based on Yield of Even-Aged Stands of Ponderosa Pine, USDA Technical Bulletin 630, by Meyer, W. A., 1938.