



CENTRAL HARDWOOD NOTES

Forest Site Classification In The Interior Uplands

Introduction

Classification and evaluation of forest sites is an essential step in managing central hardwood forests. In Note 4.01, *The Importance of Site Quality*, the usefulness of land classification systems was discussed. The present Note describes one of those systems in more detail. It is an easy-to-use system developed for the Cumberland Plateau and Highland Rim-Pennyroyal physiographic provinces in Alabama, Tennessee, Georgia, Kentucky, and Virginia. Although the system applies only to a limited portion of the central hardwood forest, the concepts used to develop the system are probably applicable to the entire area. Potential users must first obtain copies of the publication listed at the end of this Note.

In this system the landscape is stratified according to physiography, climate, geology, soils, topography, and vegetation. Macroclimate does not vary much across both provinces, but microclimate varies because of local relief. Existing vegetation is of minor importance because, generally, today's forests often do not indicate site potential and present stand boundaries may or may not coincide with site boundaries.

Five-Level System

The system has five levels. Physiographic province is the largest and least detailed level. Landtype is the smallest and most detailed level, and is considered the basic unit of land for management. Intermediate levels are region, subregion, and landtype association. The Cumberland Plateau was divided into four regions and the Rim was divided into two regions. A separate guide was published for each of these six regions (see References).

Although nearly 200 landtypes were identified and described—95 on the Plateau and 98 on the Rim, most tracts of land smaller than 500 acres seldom contain more than 12 landtypes. Landtype names are composed of two or more of the following descriptors: topographic—e.g. broad upland, ridge, slope, or streambottom; geologic—e.g. sandstone or limestone; aspect—north or south; or soil drainage—good or poor.

Standard Format of the Guides

A standard format for describing the landtypes was developed to enable users of the system to recognize landtypes. Each landtype is described in terms of nine elements—*geographic setting, dominant soils, bedrock, depth to bedrock, surface soil texture, internal soil drainage, relative soil water supply, soil fertility, and vegetation*. The landtype used in the example (table 1) is Landtype 1, Broad Undulating Sandstone Uplands on the Mid-Cumberland Plateau.

Table 1 .-Forest management interpretations for Landtype 1: Broad Undulating Sandstone Uplands on the Mid-Cumberland Plateau.

PRODUCTIVITY				
Species	Site index		Average annual growth cubic feet per acre	
	Natural stands	Old-field plantations	Natural stands	Old-field plantations
	age 50	age 25	age 50	age35and40
E. white pine	75	52	126	145
Shortleaf pine	65	45	131	102
Loblolly pine	75	50	114	117
Virginia pine	70		92	
E. red cedar	30			
Upland oaks	60		43	
Yellow-poplar	85		80	

MANAGEMENT PROBLEMS				
Plant competition	Seedling mortality	Equipment limitations	Erosion hazard	Windthrow hazard
Moderate	Slight	Slight	Slight	Slight

SPECIES DESIRABILITY		
Most desirable	Acceptable	Least desirable
E. white pine	Hickories	E. red cedar
Shortleaf pine	White oak	Post oak
Loblolly pine	Chestnut oak	Sassafras
Virginia pine	Black oak	Serviceberry
Yellow-poplar	S. red oak	Black locust
	Scarlet oak	American holly
	Sweetgum	Red maple
	Black cherry	Blackgum
	Dogwood	
	Sourwood	
	Persimmon	

Following each landtype description are forest management interpretations. Each landtype is evaluated for productivity (site index and mean annual cubic growth) and desirability (most desirable, acceptable, and least desirable) of selected conifers and hardwoods for timber production. In addition, each landtype is rated (slight, moderate, or severe) for five soil or site-related problems-plant competition, seedling mortality, equipment limitation, erosion hazard, and windthrow hazard-that can affect forest management operations (table 1).

Application

To use the system, you must first determine the physiographic province and region in which your forest land lies from the map in figure 1. Send for that guidebook (see References). After you get the guidebook, here is how the system works:

1. Determine the subregion and landtype association where your land occurs using the guidebook.

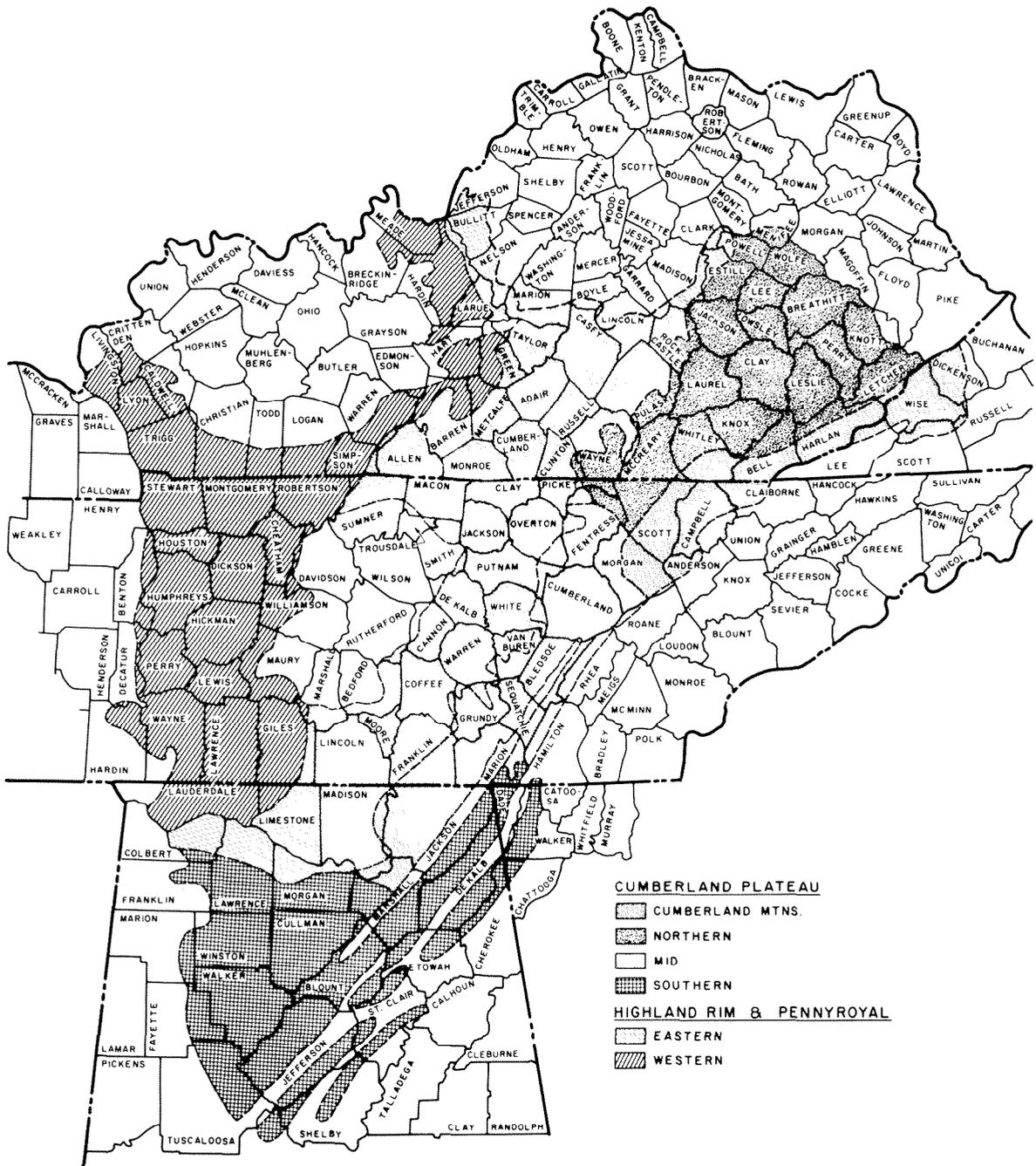


Figure 1 .-Locator map showing physiographic provinces and regions. (See References and order guidebook for your area.)

2. Determine which landtypes may occur on the tract in question using the summary of landtypes and the individual landtype descriptions.
3. Read the description of each landtype and decide which of the possible landtypes actually occur on the tract in question. This step can usually be done at the desk if the user is familiar with the tract. A field reconnaissance will be necessary if you are unfamiliar with the tract. Landscape drawings are included in each guidebook to assist you in determining where the individual landtypes occur on the landscape. (For an example see fig. 2.)

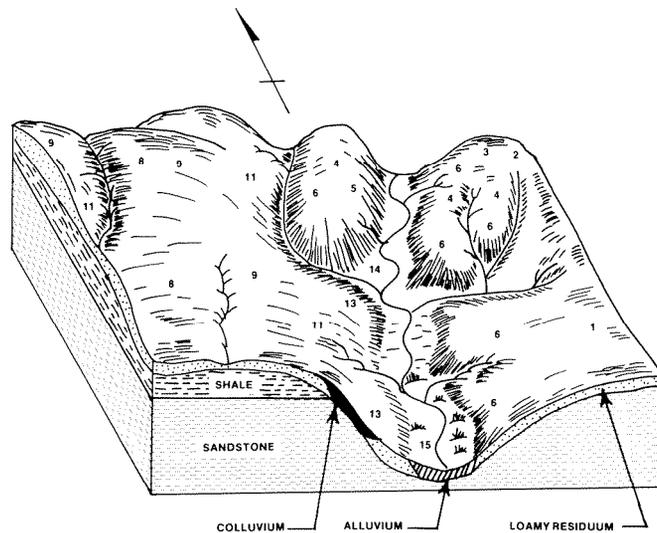


Figure 2.-Landscape characteristic of the weakly and moderately dissected portions of the surface of the Mid-Cumberland Plateau. Landtypes (numbers) in the legend are described in General Technical Report SO-38.

4. Refer to the accompanying tables of interpretations for each landtype to determine species productivity, species desirability, and severity of management problems (example, table 1). You may wish to modify these timber production oriented interpretations where other land uses are a primary consideration.
5. Make a landtype map using a topographic map or aerial photo for the base. You can do this at the desk if you are familiar with the tract, or in the field if you are unfamiliar with the tract. Determine the acreage of each landtype.

Continuous forest inventory or other inventory systems can easily be linked with this site classification system to obtain information on acreage, stocking, composition, and growth of forests by landtypes. Once productivity data are available on a specific tract, they should be substituted for the regional values.

For additional information or copies of the individual regional site classification guides, write the Southern Forest Experiment Station, USDA Forest Service, U.S. Postal Service Bldg., 701 Loyola Avenue, New Orleans, LA 70113.

References

- Smalley, G. W. 1979. Classification and evaluation of forest sites on the southern Cumberland Plateau. Gen. Tech. Rep. SO-23. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 59 p.
- Smalley, G. W. 1980. Classification and evaluation of forest sites on the western Highland Rim and Pennyroyal. Gen. Tech. Rep. SO-30. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 120 p.
- Smalley, G. W. 1982. Classification and evaluation of forest sites on the Mid-Cumberland Plateau. Gen. Tech. Rep. SO-38. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 58 p.
- Smalley, G. W. 1983. Classification and evaluation of forest sites on the eastern Highland Rim and Pennyroyal. Gen. Tech. Rep. SO-43. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 123 p.
- Smalley, G. W. 1984. Classification and evaluation of forest sites in the Cumberland Mountains. Gen. Tech. Rep. SO-50. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 84 p.
- Smalley, G. W. 1986. Classification and evaluation of forest sites on the northern Cumberland Plateau. Gen. Tech. Rep. SO-60. New Orleans, LA: U.S. Department of Agriculture, Forest Service, Southern Forest Experiment Station. 74 p.
- Smalley, G. W. Classification and evaluation of forest sites in the southern Ridge and Valley. (In prep.)

Glendon W. Smalley
Southern Forest Experiment Station
USDA, Forest Service
Sewanee. Tennessee