



CENTRAL HARDWOOD NOTES

Choosing A Silvicultural System

What to Consider When You Choose a Silvicultural System

Based on the species present and environmental limitations, your choices depend on:

1. Owner objectives.
2. Species selected for regeneration.
3. Growth requirements of desired species.
4. Site productivity.
5. Stand characteristics such as tree age, species, density, and regeneration potential.
6. Existing climatic and soil conditions.

Landowners frequently have definite objectives and preferences that should influence the selection of a silvicultural system. Timber production is not the primary reason many landowners practice forestry, and silvicultural practices must be flexible enough to provide other “products” such as wildlife, esthetics, and recreation.

Silvicultural Systems for Even-age Management

Even-age management includes clearcutting, shelterwood, or seed-tree silvicultural systems. Clearcutting is harvesting in one cut all trees on an area to create a new, even-age stand. The area harvested may be a patch, strip, or stand. You obtain regeneration through advanced reproduction or new seedlings, through stump or root sprouting, or through planting or direct seeding.

In the shelterwood system, the mature stand is removed in a series of cuts. Regeneration of the new stand occurs under the cover of a partial forest canopy or shelterwood. A final harvest cut removes the shelterwood and permits the new stand to develop in the open as an even-age stand.

In the seed tree system nearly all the trees on a selected area are harvested in one cut. A few select trees of the desired species are left to reseed the area naturally. After regeneration is established, the seed trees are removed. You rarely use this method in hardwoods.

These even-age systems are alike in one respect—you remove all the overstory trees within a short period. The regeneration cut is normally made only once per rotation, and the rotation is marked abruptly by the end of one stand and the beginning of another on the same area. Usually the regeneration cut is followed by a series of intermediate practices such as cleaning, crop tree release, and/or thinning before the next regeneration cut. The rapid removal of the overstory normally favors the regeneration of fast-growing, intolerant species although a

mixture of tolerant and intolerant species is common and provides a variety of species to manage in the new rotation.

A disadvantage of even-age management is that areas look unsightly during and after logging. The unsightliness often persists until regeneration develops into sapling or pole-size stands. Another problem is that clearcuts encourage many landowners to graze livestock in newly harvested areas and severely retard the regeneration. Sometimes deer cause similar problems.

Systems for Uneven-age Management

Uneven-age management includes the selection silvicultural system. In this system, you cut mature and immature trees either singly or in groups at periodic cutting intervals. Regeneration is continuously established and residual trees are provided space to grow and develop. The objective is to create a stand with trees of different ages and sizes.

You reach this goal by a series of periodic partial cuts over the entire stand. The basic idea with selection cutting is to maintain a stand with trees in all diameter classes. Advanced reproduction will be present in the understory or in small openings created by cutting groups of trees. Shade tolerant species eventually dominate uneven-age stands that are managed by single-tree selection. You can encourage greater proportions of intolerant species by creating canopy openings at least a half acre in size. Often crop trees need to be released to maintain the desired stand composition.

Diameter limit cuts are usually not recommended, but they are commonly practiced throughout the region. Some stands with well developed advanced reproduction of the desired species can be cut using a diameter limit. This reduces the overstory shade and releases the emerging dominant understory trees. It also allows you to remove those undesirable overstory trees that are future sources of unwanted seed. If you use diameter limits, consider at least a minimum cutting diameter of 16.0 inches d.b.h. and also remove undesirable trees below this minimum.

Summary and Recommendations

Both the even-age and uneven-age management silvicultural systems have some objectives in common-trees are cut to produce market goods and to ensure regeneration and maintain the desired diameter and age distributions. All silvicultural systems need to include some intermediate cultural practices to maintain vigorous growth of quality trees and ensure the efficient production of the key species.

- If you plan to manage your woodlot, yet want it to remain somewhat esthetically appealing, use a partial cutting practice such as single-tree selection.
- If you want new stands dominated by a variety of shade intolerant and some tolerant timber species and there are no wildlife problems such as severe browsing by deer, use clearcutting or a type of shelterwood.

- . If you want to increase the amount of intolerant species in your woodlot, and you do not want to clearcut the entire stand, clearcut small openings of 0.5 to 2.0 acres about every 10 to 20 years.
- . If you want to periodically increase deer browse or wildlife “edge species,” cut small openings of 0.5 to 2.0 acres every 10 to 20 years.
- . If you want new stands dominated by shade tolerant timber species, use partial cutting such as single-tree selection.
- . If you cut to a diameter limit, raise the minimum size to at least 16.0 inches d.b.h. Also remove undesirable trees below the minimum cutting diameter.
- . If you want timber species and have oak-pine or bottomland hardwoods, use clearcutting, shelterwood, or seed tree practices.
- . If you want to increase the number of cavity or den trees in your woodlot leave a few trees such as beech, basswood, blackgum, birch, oaks, hickories, and/or maples.

There are many ways to manage forest stands, and there are no simple rules to meet the wide variety of landowner objectives for all stand conditions. The key to making good silvicultural recommendations is to start with the landowner’s highest priority. The burden is then on the forester to inform the landowner of alternatives and guide the development of a management plan. A well informed landowner must at least know the major trade-offs at stake and the consequences of the various alternative silvicultural systems.

References

- Burns, Russell, tech. coord. 1983. Silvicultural systems for the major types in the United States. Agric. Handb. 445 Washington, DC: U.S. Department of Agriculture, Forest Service. 191 p.
- Society of American Foresters. 1981. Choices in silviculture for American forests. Washington, DC: Society of American Foresters. 80 p.

H. Clay Smith
 Northeastern Forest Experiment Station
 USDA Forest Service
 Parsons, West Virginia

Gary G. Naughton
 Extension Forester
 Kansas State University
 Manhattan, Kansas