



CENTRAL HARDWOOD NOTES

Stand Size, Stand Distribution, And Rotation Lengths For Forest Wildlife

The key to managing forest wildlife is providing diverse habitats. Stand size, stand distribution, and rotation length determine how diverse habitats will be. Since the tenure of private forest owners is generally shorter than prescribed rotations, rotation recommendations serve more as guides to the amount and intensity of cutting needed to maintain desired habitat. In making silvicultural prescriptions, including stand sizes and distribution, we must consider the home ranges and habitat needs of desired species in meeting the wildlife objectives of private owners or land managers.

Wildlife of Young Forests

A wide variety of generally herbivorous and insectivorous species are adapted to young, dense, fast growing hardwood stands. Species such as ruffed grouse, woodcock, bobcats, cottontail rabbits, and many songbirds are the “pioneer” species or “opportunists” because they are associated with early successional forests—stands less than 40 years old resulting from intensive cutting, fire, disease outbreaks, or extensive wind damage. These species respond quickly and often become abundant when suitable habitat is created. They benefit most from small stand size, short rotations, and a variety of age classes.

Clearcutting, shelterwood, and group selection silvicultural methods create the diverse habitats needed for these species, especially in the oak-hickory association. Single tree selection is appropriate for streamside buffer zones or for shade tolerant tree species in the elm-ash-cottonwood type.

If commercial wood products (firewood, pulp, saw logs) and wildlife populations are your management objectives, rotations should be 60 to 80 years in scattered 2- to 20-acre irregularly shaped stands with an even distribution of 10-year age classes. On intensively managed good sites you should make cuts at 20- to 40-year rotations on 2- to 5-acre stands having an even distribution of 5-year age classes. On poor sites, rotations of 30 to 50 years may be more appropriate. Cuts should be made in a “checkerboard” pattern to maximize edge and distribution of different age stands.

If you have a choice, choose large stands for habitat management. They allow you more flexibility in shaping. Large stands with irregular shapes are more pleasing in the landscape and are also beneficial to wildlife. In large stands site changes are likely to be greater and the stand will be more diverse as it develops. Small stands are more geometric in shape and are more uniform in composition and structure since they contain fewer site changes.

Wildlife of Mid-successional Forests

These wildlife species tend to be habitat “generalists.” They use a wide variety of habitat types from early to late successional forests older than 40 years. Some species depend on openings of herbaceous plants within the forest to provide palatable vegetation, insect food, and protective cover for young animals. Hard mast is generally an important food. Some species depend on well-developed understories for seasonal habitat. Select 10- to 25-acre stands then cut every 10 years over a rotation of 80 to 100 years to achieve a mix of different ages.

Wildlife of Mature Forests

Many species of mature forests need snags and/or cavity trees for life requirements. Another group of wildlife require dead and down trees and tree tops, hollow logs, and stumps. Species requiring cavity trees are also partially dependent on forest cover patterns. Some primary excavators and secondary cavity users require snag and cavity trees in dense forest with a canopy closure of more than 70 percent. Other cavity users prefer snags and cavity trees in semi-open and open canopies. Consequently, if you are going to provide for a variety of cavity users you must leave snags and cavity trees under canopies of various densities. Recommendations for snags and cavity trees are found in Note 9.05 *Treating Mature Stands* and Note 9.06 *Enhancing Wildlife Habitat When Regenerating Stands*. To provide these habitats, a minimum of 5 percent of the commercial forest land (greater than site index 45) should be set aside as permanent old growth. If old growth wildlife species are to be emphasized, at least 15 percent of the area should be set aside. If the area set aside is small, be sure to protect snags and cavity trees before thinning and final harvesting in the adjoining commercial forest land.

The stands that are set aside must be held past pathological rotation age so that there will be large declining trees and a multi-layered structure. Rotations should be extended according to the dominant tree species. The white oak group can be held 150 to 200 years; the red oak group will begin to decline rapidly after 100 years. Ideally, areas designated for old growth should be at least 15 acres in size with a minimum width of 200 feet; optimum size for old growth areas is 300 acres.

When selecting stands to set aside as old growth, first consider stands more than 90 years old with large defective trees. If these are not available, select “old growth” from stands more than 50 years old. These have the potential to achieve the large tree, multi-layered midstory structure.

In summary, the effects of stand size, distribution, and rotation length vary widely for different wildlife species. The challenge is to design a balanced management program that best satisfies the landowner's objectives for wildlife, forest products, recreation, and aesthetics. Sometimes objectives will conflict with each other and the landowner needs to understand the various trade-offs or compromises necessary to manage forests for multiple resources.

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