



Extension FactSheet

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Incorporating Wildlife Needs into Forest Management Plans

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Nearly one-third of Ohio is forested, and private individuals own over 90 percent of these forests. Forests are important not only to landowners, recreationists, and natural resource professionals but to many wildlife species as well. Forests provide these species with major habitat requirements: food, cover, water, and space. As a landowner, you have the opportunity to manage all or part of your land in a way that is sensitive to wildlife needs. If you have made the decision to harvest timber from your property, you can decide to protect important habitat components for wildlife while harvesting timber. This fact sheet describes several ways that you can incorporate wildlife needs into your forest management plan. Even adopting one or two suggestions can make your managed land more attractive to wildlife.

Benefits of Wildlife

As you probably have already experienced on your own land, wildlife can provide many aesthetic and recreational benefits to landowners. Watching a fox hunt for mice, listening to a wood thrush sing, or finding a red-backed salamander hiding under a log can add beauty and enjoyment to your day. Some landowners also enjoy hunting for wildlife on their own land.

Fewer people recognize the ecological services provided by wildlife. Each species performs a specific function in the ecosystem that directly or indirectly benefits the environment and other organisms, including humans. For example, many birds, such as blue jays, disperse acorns and other seeds throughout the landscape. Bats may reduce the numbers of mosquitoes around your home by feeding on them. Similarly, insectivorous birds can benefit trees by consuming insects living on bark, leaves, or branches. Earthworms, beetles, and some rodents turn over the soil and recycle nutrients. Ecologists are continually learning about new complex relationships among organisms and their environment. By providing habitat for wildlife, you ensure that some of these ecological, recreational, and aesthetic benefits will be maintained on your land.

Forests and Wildlife

Forests provide many wildlife species with major habitat requirements—food, cover, water, and space. When you harvest timber, the quantity, quality, and distribution of these habitat features change. As a result, certain wildlife will be favored in forests at different stages of succession. In forest succession, a grassy field or harvested stand will eventually become a mature forest.

Wildlife may be associated with forests at a particular successional stage because of the types and amounts of habitat that are provided by that stage. See Figure 1 on page 2. For example, early-successional forests have more fruit, seeds, and woody browse but less nuts, acorns, and cavity trees. Older forests have more nuts, acorns, and cavities but fewer fruits, seeds, and woody browse.

Soon after clearcutting or farm abandonment, the land may have areas of bare soil and herbaceous vegetation, such as grass. Grassy areas will provide wildlife with insects, seeds, and herbaceous food and cover. Wildlife such as cottontail rabbits, voles, and field sparrows are attracted to these areas. As succession continues, woody shrubs, seedlings, and saplings invade the area. These provide woody browse and cover as well as berries and seeds for white-tailed deer, rabbits, ruffed grouse, and songbirds (catbirds, towhees, and warblers). As the saplings grow, they usually will develop into dense stands of small trees that provide too much shade to support the shrubs of early-successional forests. These young, pole-sized forests are generally considered the least productive for wildlife, because they lack the woody browse of early-successional areas but do not yet have many features associated with mature forests, such as acorns or tree cavities. Eventually, the forest matures and has large trees that produce acorns, decaying trees with cavities, downed logs, and deep leaf litter. All of these features allow wildlife like salamanders, black bear, flying squirrels, and pileated woodpeckers to thrive.

Forest succession

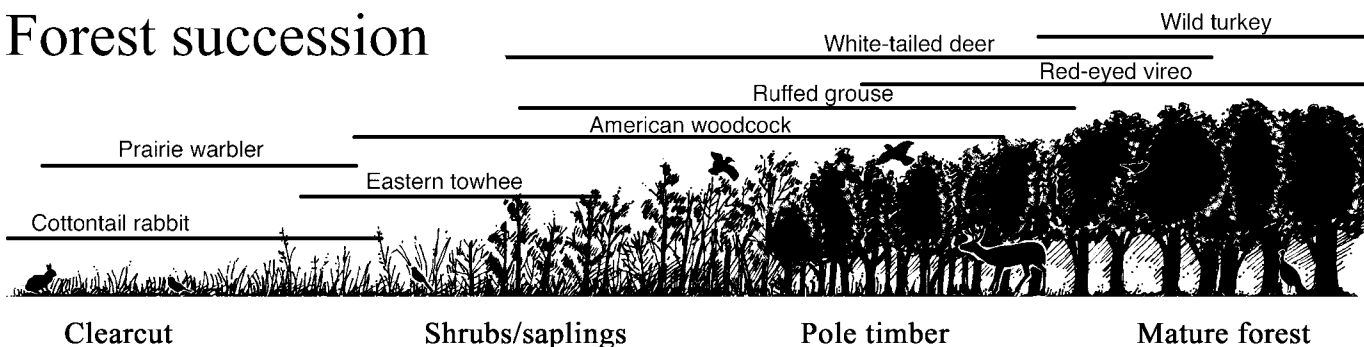


Figure 1: The above figure shows forest succession and examples of associated wildlife.

Depending on the type of harvesting you use, you will be creating or maintaining different successional stages of forest and, as a result, favoring different groups of wildlife. For example, clearcut stands will attract animals, such as eastern cottontail and chestnut-sided warbler, that use shrubs and saplings but will not be regularly used by species that require mature forests. Harvesting methods that retain large numbers of overstory trees can usually still provide suitable habitat to many forest animals, such as ovenbird, wood thrush, and scarlet tanager. Some wildlife species, like the pileated woodpecker, are called habitat specialists and will only be found in forests of one successional stage. Other wildlife are habitat generalists, such as deer, and they may occur in forests of any age.

In addition to requiring particular successional stages, wildlife also differ in the amount or location of the habitat they require. Some area-sensitive species require large amounts of land, whereas other species can live on small parcels of habitat. Many forest songbirds, such as wood thrush and scarlet tanager, are known to be area-sensitive. Location of habitat can also influence wildlife. Even if suitable habitat is available, some species will avoid using areas near a habitat edge (junction between two habitat types). These species are often referred to as interior species and include animals like salamanders and many warblers. Other wildlife, such as turkey, grouse, and deer, prefer using edges of habitat because of the abundant browse and vegetation usually present.

What Can You Do?

As a landowner, you have the opportunity to manage all or part of your land in a way that is sensitive to wildlife needs. The first step is to define your objectives in terms of income, timber, firewood, wildlife, watershed protection, and aesthetics. In addition to defining your overall goals, you also need to decide on your objectives in terms of wildlife management. For example, do you want to manage only for specific game species, or do you want to manage for species that use mature forests? The next step is to contact a professional forester or a wildlife biologist. Be sure to specify your objectives to that person. Make it clear that you want to incorporate wildlife needs into the timber-harvest plan.

Forest Management Approaches

There are two very different approaches to forest management: even-aged and uneven-aged management. Even-aged forest management removes most overstory trees from a stand. Ex-

amples are clearcuts (all trees removed), seed-tree cuts (a few trees are left standing to be sources of seeds for regeneration), and shelterwood cuts (more trees are left to provide shelter to regenerating trees). These methods work best when you are trying to regenerate trees that are not tolerant of shade, such as oak. Because the trees will regenerate at the same time, even-aged methods create stands dominated by one age class. Uneven-aged management creates stands with at least three tree age classes by cutting scattered individual trees (single-tree selection) or small groups of trees (group selection). Because stands treated with uneven-aged techniques retain many overstory trees, shade-tolerant tree species, like maple and beech, regenerate best in these stands. Uneven-aged management also may be a good strategy on small parcels of forest if landowners want to realize both timber and wildlife benefits. Based on your goals, the type of forest you have, and other site characteristics, a professional forester can suggest which method is appropriate for your land.

Even-aged and uneven-aged management approaches differ greatly in which wildlife are favored by creating either early- or late-successional stands. From a wildlife perspective, the “best” approach depends on the availability of nearby habitat and the sensitive wildlife species in your area. For example, if you have one of the only large tracts of forest within several miles, then forest wildlife may rely heavily on your land for habitat requirements, and an uneven-aged approach may be best. However, if your land is within a highly forested area, then an open or shrubby harvested stand produced by even-aged techniques might provide important habitat for wildlife associated with early-successional forest.

How to Incorporate Wildlife Needs into Your Forest Management Plan

Protect unique or important habitat features, such as vernal pools and spring seeps. Vernal pools are temporarily filled with water during rainy seasons, and they are critical breeding and hibernating grounds for amphibians because they do not contain fish and other predators. Spring seeps are small streams or ponds with year-round water from belowground sources. Seeps are particularly important in the winter, because they are less likely to freeze and be covered by snow. In addition, important food resources, such as herbaceous vegetation and insects, are often abundant near seeps. Harvesting near pools and seeps can destroy the habitat they provide by affecting

water temperature and quality as well as adjacent food and cover. If possible, do not harvest within at least 100 feet of these important habitat features.

Retain buffers along streams. Riparian habitats perform critical ecological functions as well as provide habitat for a rich diversity of flora and fauna. Harvesting near streams not only destroys riparian habitat for terrestrial wildlife but also harms aquatic habitat by increasing water temperature and sedimentation. To reduce the negative impacts, leave buffer strips of unharvested trees (at least 50–100 feet wide) along both sides of streams. Remember to keep roads and skid trails at least 50 feet away from water and minimize the number of stream crossings for roads. If you are logging on a slope, these buffers should be wider.

Do not harvest all trees. Retain some live overstory trees in a variety of species and size classes. More wildlife will use harvested stands that contain residual trees because of the perching, nesting, and foraging opportunities they provide. In addition, by retaining at least one individual tree of every species on your land, you increase the probability of some seed production every year. Sometimes retaining a single mature tree of a species uncommon to your woodlot can preserve wildlife values not provided by a common tree species. Aside from providing food and cover to wildlife, the retention of overstory trees and snags can accelerate regeneration of clearcut stands because birds that perch on trees may excrete seeds.

Enhance the vertical structure within the stand. Some animals forage or nest only in small saplings or shrubs, whereas others spend most of their time in the forest canopy. By retaining trees, saplings, and shrubs in a variety of size classes, you can provide more vertical layers of forest to wildlife.

Retain decaying and dead trees (snags). Woodland owners are often encouraged to remove dead or decaying trees since they have little market value, but these trees are important to wildlife, especially because decay is a slow process. For wildlife use, snags should be greater than 8 inches diameter breast height (dbh). Leaving all standing dead trees is best for wildlife, but at least one large (greater than 18 inches dbh) cavity tree per few acres is needed for larger species that use cavities, such as wood duck, pileated woodpecker, and mergansers. Beech, basswood, and aspen are generally good cavity-producing trees. A professional forester can evaluate any safety threats posed by a particular snag and then recommend actions that you can take to minimize the risk.

Retain dead and down wood. Many animals, especially salamanders and small mammals, use logs, slash, and other woody debris for cover, dens, nests, foraging sites, and even as places for courtship displays. If possible leave large logs that will last longer than small logs. Also, try to leave some woody debris in piles to prevent quick decay, especially in wet sites. Brush piles can be placed anywhere but are most useful near edges, food sources, water, or areas with little cover.

Create irregular rather than straight or abrupt edges to the cut, and reduce the contrast between habitats at edges. Some wildlife, such as salamanders and certain forest birds, avoid using abrupt edges, and those that use them may experience high rates of predation. Edges are often associated with higher amounts of nest predation, fewer food resources for

Which live trees should you retain?

- Try to retain some of each tree species on your land. If possible, retain several individuals of each species within the stand.
- Retain trees that produce mast, such as beech, oak, cherry, and dogwood. Mast refers to fruits and seeds of trees and shrubs; it's an important food source for many wildlife. Hard mast (e.g., acorns and beechnuts) is especially important in the fall and winter diets of many wildlife such as white-tailed deer, black bear, wild turkey, woodpeckers, and squirrels. To select trees that have steady seed production potential, choose trees of large size and moderate age with full, rounded crowns. Soft mast (e.g., cherries and grapes) is produced by fruiting trees, shrubs, and vines. Fruiting trees along woodland edges are especially valuable because sunlight stimulates heavy fruiting.
- Retain small groups of conifers (such as pine and hemlock). Because they keep their needles year-round, conifers provide important winter cover for wildlife, especially in snowy areas. Their seed-bearing cones also are a food source for many animals.
- Leave some long-lived trees, such as white oak, sugar maple, yellow birch, American beech, white ash, and red oak.
- Leave small groups of trees. This will provide small islands of habitat for wildlife as well as make trees more stable and resistant to wind.
- Leave trees with loose, rough, or deeply furrowed bark to provide foraging sites for birds that glean insects from bark. Loose bark may also provide roost sites for bats and nest sites for brown creepers.
- Retain living trees with cavities. Tree cavities provide shelter, dens, nests, and foraging sites for many wildlife species. In Ohio, over 50 species of birds and mammals use tree cavities. Some damaged young trees also can be reserved to provide future cavity trees. Trees with fungal conks, dead branches, old scars, and soft or decaying wood (especially heartrot) are good indicators of cavity potential.

some species, warmer air and soil temperatures, drier conditions, and more wind than interior forest. Edges between very different habitats, like between a mature forest and agricultural land, are abrupt and high-contrast. These edges generally have more negative “edge effects” than gradual or low-contrast edges. In addition, edge-adapted species, such as deer, may prefer gradual edges that provide both cover and foraging opportunities. Low-contrast, gradual edges can be made by allowing shrubs, saplings, and some overstory trees to remain along the harvest boundary. Edges can be feathered by retaining more trees closer to the forest interior and gradually fewer trees closer to the harvest area. See Figure 2 on page 4.

Leave large patches of forest close to other forest patches. If you are trying to manage for forest-associated species, then you need to consider patch size (how large a piece of habitat is) and the amount of isolation (how far that patch is from other

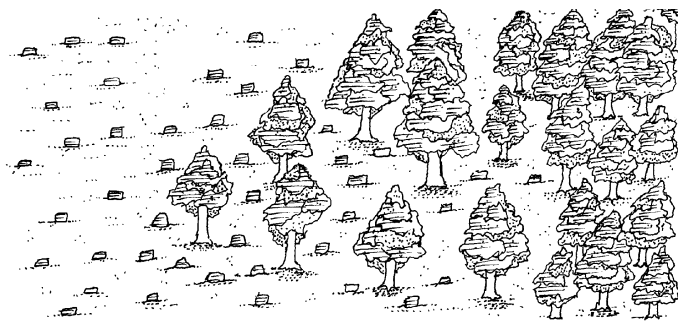


Figure 2 shows a feathered cut to the forest.

patches). Both of these can strongly influence populations of certain forest wildlife. For example, small woodlots, which have a lot of edge relative to forest interior, generally have less diverse and abundant bird communities than in larger forest areas. In addition, dispersal of animals may be impaired when woodlots become isolated, especially for salamanders and mammals. As a result, landowners trying to manage for forest wildlife should try to harvest in a way to leave the largest patch size possible and, if possible, leave patches closer to, rather than farther from, other patches.

Try to maximize the interior forest of your unharvested stands. Forest interior is unbroken forest at least 200–300 feet from habitat edges and usually is positively related to the size of a patch of forest (i.e., the larger the patch size, the more forest interior there is). To maximize the amount of interior forest, you can cut around the borders of a forest stand rather than fragment the stand into smaller ones. Also, circular and square-shaped forest patches retain more forest-interior than oblong, rectangular, or irregularly shaped patches.

Consider leaving a portion of your land unharvested or using longer cutting cycles. The machines, noise, people, and alteration of habitat associated with harvesting operations are disturbing to most wildlife. Not harvesting in some areas will provide forest wildlife with some habitat that is free of disturbance and intensive human activity.

Limit the size of your clearcut. Harvested stands that are very large can inhibit wildlife from using them or even crossing them. In addition, large harvests without residual trees may take longer to regenerate because seed sources are more distant. If you are trying to manage for wildlife that use edges, small clearcuts (e.g., between 5–40 acres in size) may be best. On the other hand, multiple small cuts in forested areas will be detrimental to many animals associated with the forest-interior. Another consideration is that small cuts in areas with high deer density can have difficulty regenerating. Ultimately, the desirable size will depend on your goals, the wildlife species that you want to attract, and characteristics of your woodlands. Again, you should check with a professional forester about appropriate harvest sizes for your land.

Seed log landings and roads. As soon as the logging is completed, haul roads and skid trails should be graded to eliminate ruts and then re-vegetated with grasses. Lime, fertilizer,

and mulch may be needed in order to establish good grass cover. Water bars should be installed at intervals of 35–250 feet depending on the length and slope of the road or trail. Unless you intend to do this work yourself, you should put these requirements in the timber sale contract that you have with your logger. If the roads and trails are likely to get heavy use from off-road vehicles, you may want to install to protect these newly-seeded areas.

Specify all wildlife management prescriptions that you want performed on your land in your timber sales contract. Do not assume that the forester or logger will automatically know how you want to be sensitive to the needs of wildlife. Ultimately, incorporating wildlife needs into your forest management plan is your responsibility.

Best Management Practices for Erosion Control on Logging Jobs in Ohio

Grass Seed Mixtures for Disturbed Sites:

Skid Trails and Road Cuts

Perennial Rye Grass	50%
KY31 Tall Fescue	20%
Potomac Orchard Grass	20%
Red Clover	10%

Landings and Flat Cuts

Perennial Rye Grass	50%
Red Top Clover	20%
Potomac Orchard Grass	20%
Ledina Clover	10%

Glossary

Area-sensitive species: A species whose occurrence or reproductive success is reduced in small habitat patches.

Ecosystem: All living (e.g., plants and animals) and non-living (e.g., water and nutrients) components of the immediate environment and the interactions between them.

Edge species: A species that prefers to use habitat edges, such as the interface between a clearcut and a mature forest.

Forest-interior species: A species that requires large tracts of forest away from habitat edges.

Habitat: The place where a microorganism, plant, or animal lives.

Habitat generalist: An organism that can live in a variety of habitats.

Habitat specialist: An organism that requires a specific type of habitat, such as an old growth forest.

Mast: The fruits, seeds, or nuts of trees and shrubs.

Snag: A standing dead tree.

Succession: The gradual replacement of one community of plants by another (e.g., an abandoned field ultimately becomes a forest again).

Vertical structure: The layers of foliage within a habitat (e.g., ground, understory, subcanopy, and canopy).

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