



Pennsylvania Woodlands

The Pennsylvania State University, College of Agriculture, Cooperative Extension Service

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Woodland wildlife management

Wildlife is a renewable resource of great interest to private forest landowners in Pennsylvania. Unfortunately, many landowners believe that unmanaged woodland is best for wildlife. This is usually not the case. Wildlife species have certain needs that are not satisfied in all woodland. If needs are not met, some form of management may be necessary. In most situations, the numbers and diversity of wildlife can be increased with proper management.

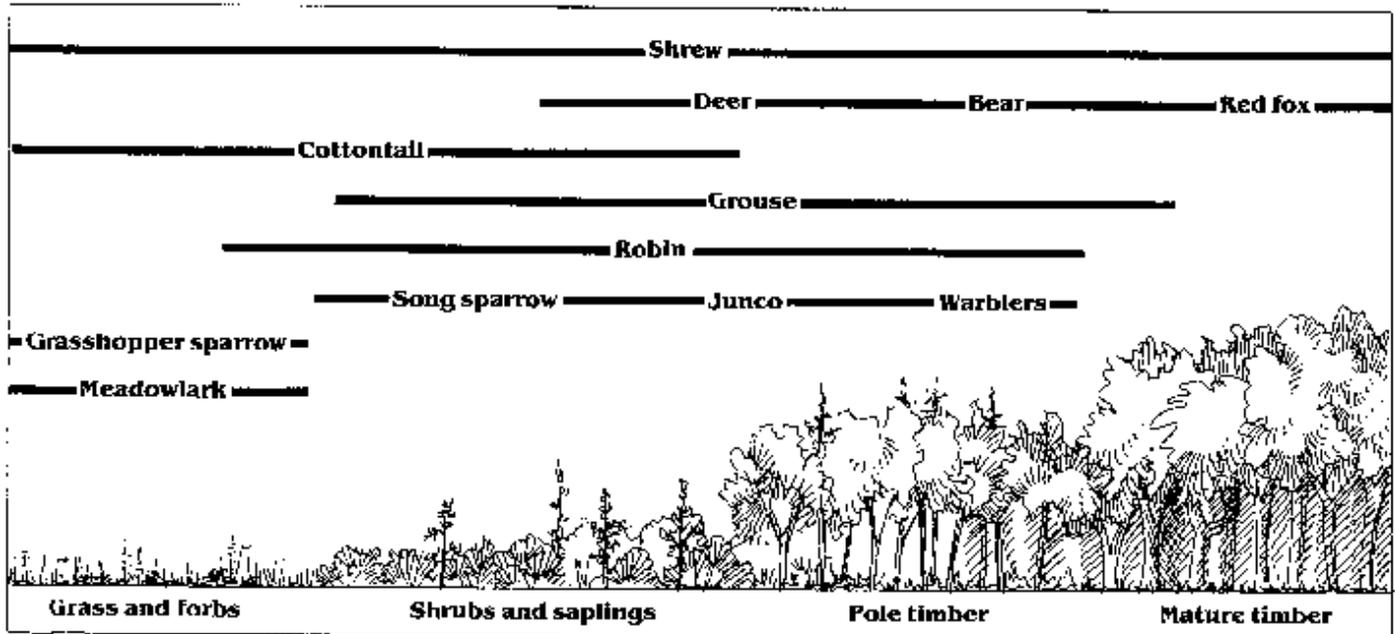
Wildlife has four basic requirements for survival: food, water, cover, and space. These must be supplied by the animal's habitat, the environment in which it lives. Landowners can do little about providing space and water. However, food and cover can be managed easily for the benefit of wildlife by the private forest landowner.

This newsletter briefly discusses two ecological principles important to good wildlife management, describes several types of habitat, and offers guide-

lines for developing a diversified forest suitable for a variety of wildlife species. Before using these guidelines, you should take an inventory of the species present on your woodland and consider your objectives in managing these woodland resources (e.g., providing timber, fuelwood, pulp, maple syrup, and Christmas trees or using the land for recreational activities such as cross-country skiing and hiking). You should also take into account how any changes made in your woodlands would affect the surrounding land.

SUCCESSION AND EDGE

Wildlife management is based on ecological principles. The manipulation of your woodlot depends especially on two principles. The first — succession — can be defined as the orderly progression of plant and animal communities over time in the absence of disturbance. This is easily illustrated by what happens to



an old field surrounded by forest. In time the field is invaded by annual weeds, then perennials and shrubs. These, in turn, are replaced by saplings and pole timber, and finally a mature stand of trees.

Different animal species take advantage of the different habitat conditions offered by each stage of succession. Therefore, to maximize the variety of animals in your woodland, you should create as many different stages of succession as possible. This management technique leads to horizontal diversity of plant communities, which in turn provides a multitude of habitats for wildlife. It is easily accomplished through timber harvests, fuelwood cuttings, timber stand improvement cuts, mowing, and plowing.

The second important ecological principle is edge. Edge is defined as the boundary between two different stages of succession, or, in general, between any two different ecological communities. Edge is the interface between a pond and a stand of trees, high and low evergreen cover, a logging road and the forest, a grassy field and a timber stand. Often the diversity of animals is greatest along an edge, because the transitional area around the edge allows a variety of habitats to exist in close proximity to each other. Therefore, it is to the landowner's advantage to maximize the amount of edge in the woodland.

IMPORTANT HABITAT COMPONENTS



Forest openings

Forest openings, also called herbaceous openings, are areas in the forest where woody vegetation is absent or sparse. These areas are generally covered with herbaceous, or nonwoody, plants such as grasses and forbs. Such plants serve as substrata for grasshoppers and other insects that thrive in the opening. The insects, in turn, are an important source of protein for ruffed grouse chicks and wild turkey poults. Other species, such as deer and rabbits, graze on the succulent forage. Foxes, raptors, and other predators are attracted to the openings because of an abundance of small mammals such as mice and voles. A greater diversity of songbirds are found in or near openings than are found in the adjacent forest.

Maintaining about 3 to 8 percent of your wooded area in openings is a good wildlife management practice. The number of openings also depends on the type of land surrounding your property. If you are near farmland or other open areas, you need fewer openings than if your woodland is surrounded by continuous forest.

Log landings can be enlarged and, along with haul roads, can be seeded with grasses and legumes after the logging operation is completed. For maximum penetration of sunlight, log landings should be as wide as twice the height of surrounding trees. Trails and right-of-ways also can provide herbaceous openings. Maintenance of the openings may be necessary from time to time and can be achieved by mowing, tilling, and fertilizing.



Brush stage forest

Brushy areas in the forest consist of dense patches of small woody vegetation. Generally the brush is com

posed of young trees known as seedlings and saplings. An abundance of young trees is usually the result of planned timber operations, which are a means of regenerating the forest. Brush also can be in the form of dense pockets of shrubs, such as scrub oak hawthorne, or speckled alder.

Brushy areas provide food for wildlife in the form of browse (i.e., stems and branches) and fruits. Because of the density of these areas, they also provide excellent escape and nesting cover. Many wildlife species, including white-tailed deer and American woodcock benefit from brushy habitat. Songbirds, such as the rufous-sided towhee, are dependent on brush for some of their habitat requirements.

If brush is absent from a woodland, it can be created through the careful harvesting of timber. Approximately 10 percent of a woodland should be in the brush stage to accommodate the wildlife species associated with these areas. Before any timber cutting operations are performed, consult a qualified forester (see Pennsylvania Woodlands, Number 1).

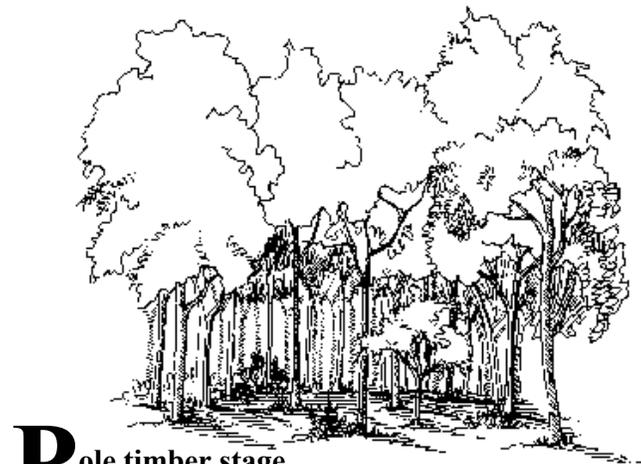


Mature timber/mast trees

When sexually mature, trees are capable of producing mast. Mast is the fruit of woody plants. Mast can be the hard-shelled seeds of oak hickory, walnut, or beech; the dry fruits of ash, maple, elm, and basswood; or fleshy fruits of trees like blackcherry and apple. Mast is a high-protein food source for animals and birds such as black bears, ruffed grouse, and blue jays, and the nuts are an important source of body fat, which animals need to survive in the winter.

About 25 to 50 percent of the trees in your woodlot should be capable of producing mast. In planning a selective timber cutting operation, consideration should be given to retaining a diversity of mast trees. For example, acorns from white oaks reach maturity in one year, whereas it takes acorns from red oaks two years. Having both species of oaks on your property will help ensure a sufficient supply of acorns in years of poor acorn production.

Mature trees also provide nesting and feeding sites in their canopies. The upper branches and leaves that make up a tree's crown attract a variety of songbirds.



Pole timber stage

Seedlings and saplings eventually grow out of the brush stage into what foresters call the pole timber stage. Although some wildlife species benefit from the pole timber stage, it is generally of much less value than brush.

Remedial actions can be taken in pole timber areas to increase their potential for wildlife. The pole timber stage often provides the first opportunity for tree harvest, whether it be for fuelwood, weeding, or a thinning operation. During the harvest, careful attention should be paid to tree species. Save those species that you want to bring to maturity. Encourage a diversity of tree species, particularly those that will provide food or shelter for wildlife when they mature (examples are given below). Brush piles, which provide valuable wildlife cover, can be built from the woody debris left after the harvest.

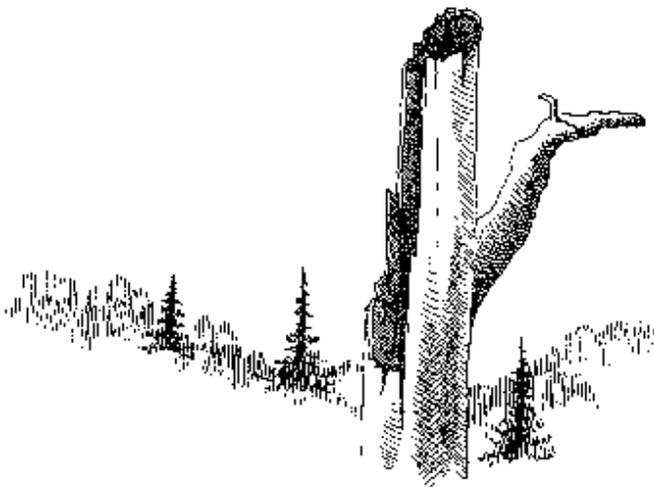




Large old trees

Most of the forested land in Pennsylvania is second growth. Scattered throughout the forests, however, are large, old trees that were left from the earlier cuttings. These trees usually have many limbs and branches that allow the trees to dominate the forest canopy and are therefore excellent producers of mast. Their numerous limbs provide a variety of roosting sites, and the large trunks may have cavities that animals can use for dens. Many animal species, including great horned owls, porcupines, and raccoons, find haven in these trees.

Consideration should be given to retaining these trees in your woodland. If none of these trees can be found, consider reserving 1 to 5-acre patches of trees from harvest, especially near spring seeps, steep ravines, or along edges of coniferous stands. Strive to maintain 1 to 3 percent of your woodland in trees of this type.



Snags and cavity trees

Snags are dead forest trees that are still standing. They are characterized by broken tops and limbs and are usually infested with insects and fungi. Snags are good feeding sites for many bird species, and are used as perches by flycatchers, hawks, and owls.

Cavity trees are trees containing at least one hole that is suitable as a wildlife nesting site. Cavity trees can be living trees or snags. In Pennsylvania, 21 species of mammals and 33 species of birds use tree cavities for nest sites, dens, and escape cover. Wood ducks, white-breasted nuthatches, screech owls, pileated woodpeckers, gray squirrels, and raccoons are some of the animals that depend on cavity trees for their existence.

Retaining 1 to 5 snags and 5 cavity trees per acre of woodland is a good wildlife management practice. Trees with cavities of various sizes and an equal amount of live and dead trees offer the best habitat. Trees of different heights are preferred, with a majority of larger trees.

Consider leaving trees that have the potential to become cavity trees. Often such trees have little value for fuelwood or timber, so little economic loss is incurred if they are left standing. Large trees that have no economic value and are out-competing valuable trees in the understory can be turned into snags by girdling, thus eliminating competition with other trees, but preserving their value to wildlife as potential den trees. To girdle a tree, cut through the bark and cambium and into the wood around the tree's trunk with a chainsaw.



Evergreens

Wildlife most commonly uses evergreens as cover from the cold. Low evergreen cover, such as mountain laurel, and high evergreen cover, such as a mature eastern hemlock stand, provide areas with smaller amounts of snow accumulation and protection from winter winds. They also provide year-round escape cover. Evergreen cover is essential to many species of warblers for nesting and is often used by the common crow as a roosting site. The mourning dove nests primarily in evergreen trees.

The value of evergreens for wildlife depends on the species, size, and age of the evergreen stand and its location in relation to other cover types. Evergreen cover is best when found near brushy areas and small herbaceous openings.

Conifers can be planted if evergreen cover is nonexistent. If the area contains evergreens, try to maintain about 5 percent of your woodland in this cover and, if possible, provide both low and high evergreen cover.



Wildlife food shrubs, vines, and fruit trees

Although trees are the dominant vegetation in a woodland, there is often a layer of vegetation in the understory. Vertical diversity in the forest is as important for wildlife as is horizontal diversity. Understory plants often include shrubs, vines, and small trees that are valuable as a source of food and cover for wildlife. These species include dogwood, witch hazel, hawthorne, apple, junberry, and wild grape. Basically any fruit-producing shrub or vine can benefit wildlife. Efforts should be made to retain these plants during a timber harvest or to improve their growth and survival by release cuttings. If these species are absent or sparse, consideration should be given to planting or seeding them, especially in openings or near wet areas and evergreen cover.



Riparian zones

Riparian zones are narrow strips of land bordering streams. These areas have long been known for their importance as fish and wildlife habitats. During the hot summer months, riparian vegetation provides shade that protects aquatic life from high water temperatures. Animals depend on riparian zones for both the protective cover that the vegetation offers and for water.

Riparian zones act as natural sponges by soaking up water and lessening the effects of heavy rains and snowmelt. These areas also help to control soil erosion by stabilizing stream banks. A lack of vegetation along a stream leads to high water temperature and an increase in water turbidity, which in turn results in loss of aquatic life.

Stream margins are frequently highly productive timber sites. In any logging operation, trees should be left on both sides of a stream to provide a buffer strip 100 feet wide. Special efforts should also be made to keep logging equipment out of the stream. Haul roads and skid trails should be at least 150 feet away from the water and even farther away when logging on steep slopes.

SPECIAL HABITATS

Along with the habitats usually found in woodlands, unique or special habitats may be present on your property. These are important for wildlife and because of their uniqueness deserve specific attention.



Wetlands

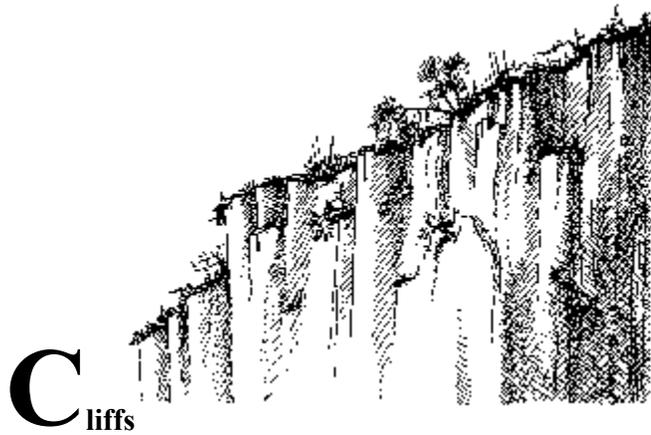
A wetland is characterized by soil that is periodically saturated or covered with water. Wetlands are the most productive and the rarest habitat type in Pennsylvania. These areas support the greatest variety of wildlife species. Despite their great importance to wildlife, an alarming number of wetlands are lost each year to development. Wetlands should be preserved or enhanced to protect the many species of waterfowl, furbearers, shorebirds, and songbirds that thrive in these areas.



Spring seeps

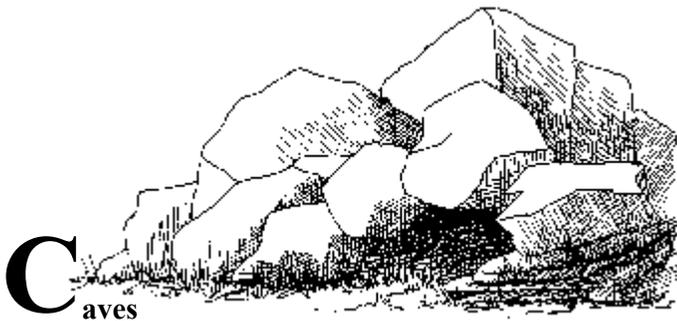
Spring seeps occur throughout the mountainous areas in the northeastern United States. Seeps exist where water percolates through the soil and emerges from the ground on lower slopes. The surfacing of this ground water creates snow-free areas in the winter. These areas may be the only places in a woodland where wildlife, such as the wild turkey, can move and feed.

Existing seeps should be protected, and all valuable mast-producing trees and shrubs in the vicinity of seeps should be retained. Encouragement of herbaceous vegetation around seeps and the planting of food shrubs or evergreen cover are desirable.



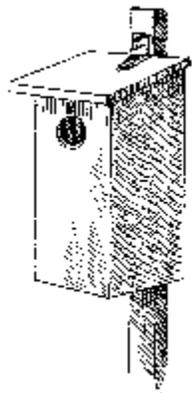
C liffs

Cliffs are generally steep, vertical rock facings. They provide secure nesting sites and unique micro-habitats for some species of wildlife. Birds such as raptors and cliff swallows can be found on these rocks, along with reptiles, amphibians, and mammals. Although management potential for these areas is limited, their value to wildlife should be recognized.



C aves

Caves are natural underground chambers that open to the surface. Caves provide shelter, nesting, and roosting sites for animals such as bats, woodrats, and bobcats. As in the case of cliffs, the management potential of caves is limited. Disturbance of these areas should be minimized.



A rtificial nest structures

Artificial nest structures are man-made structures designed to provide shelter for certain wildlife species. These artificial structures can be used to supplement or enhance an area in which management options are limited. Many birds and mammals can benefit from artificial nests. However, houses must be built to certain specifications and be properly placed to ensure desired results.

SUMMARY

The key to wildlife is habitat. The environmental needs of animals, especially those of food and cover, can be met to a certain extent through woodland management. Managing for diversity in plant communities and interspersing communities to create a greater amount of edge can increase the variety and number of wildlife in your woodland. This concept is known as "managing for species richness," an apt phrase because the wildlife benefits you derive from your woodland can enrich your life. Future issues of Pennsylvania Woodlands will expand on the topics described in this issue and will provide management strategies for individual wildlife species.

ADDITIONAL REFERENCES

- Benson, D. 1977. *Helping Wildlife: Working With Nature*. Wildlife Management Institute, Washington, DC. 26 pp.
- Clark B. (ed.). 1981. *Timber Harvesting Guidelines*. The Pennsylvania Forestry Association, Mechanicsburg, PA. 17 pp.
- Decker, D., J. Kelley, T. Seamans, and R. Roth. 1983. *Wildlife and Timber from Private Lands: A Landowner's Guide to Planning*. Information Bulletin 193, NYS College of Agriculture and Life Science, Cornell Univ., Ithaca, NY. 56 pp.
- Decker, D., and J. Kelley. 1982. *Enhancement of Wildlife Habitat on Private Lands*. Information Bulletin 181. NYS College of Agriculture and Life Science, Cornell Univ., Ithaca, NY. 40 pp.
- Hassinger, J., C. Schwary, R. Wingard. 1981. *Timber Sales and Wildlife*. The Pennsylvania Game Commission, Harrisburg, PA. 13 pp.
- Hassinger, J., L. Hoffman, M. Publisi, T. Rader, R. Wingard. 1979. *Woodlands and Wildlife*. The Pennsylvania State University, College of Agriculture, University Park PA. 67 pp.
- Leopold, A. 1966. *A Sand County Almanac*. Ballantine Books. New York, NY. 295 pp.

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