

Chapter 6. Managing Small Forest Openings for Wildlife

Judy M. Wilson, Habitat Management Unit, Connecticut Department of Environmental Protection,
Wildlife Division, Eastern District Headquarters, 209 Hebron Road, Marlborough, CT 06447
judy.wilson@po.state.ct.us

Small forest openings are generally dominated by plants that thrive in full sunlight, including herbaceous plants, shrubs and vines, and depending on how advanced succession is, seedlings, saplings, and even small trees. Small forest openings discussed in this chapter include small old fields, old homestead sites, logging roads, and log landings of several acres or less, embedded within primarily forested areas. These openings can help to diversify largely forested areas by providing early-successional habitat needed by many species of wildlife.

In contrast to the regenerating forest habitats discussed in chapter 5, small forest openings begin with a disturbance great enough to create full sunlight conditions on the ground and at least some bare soil for herbaceous plants to take hold. People create these openings through a variety of activities including land clearing and gravel mining. After abandonment, the disturbed soil and full sunlight allow pioneer species to grow.

Even though both regenerating forests and small forest openings provide low, woody growth, they differ in vegetative structure. The forest regeneration stage typically lasts 10 to 15 years and is dominated by vertical woody seedlings and saplings. The tree species found in regenerating forests will largely depend on what was there before the canopy was removed. However, shade-tolerant, late-successional species such as beech and maple typically dominate. Some shrubs and vines may be present, but the trees grow and eventually spread their crowns to create a closed canopy that shades out the sun-dependent plants in the herb and shrub layer.

Small forest openings, on the other hand, have much greater vertical and horizontal diversity due to mix of shrubs and small trees of varying heights and tangles of vines, all interspersed in patches of herbaceous vegetation. This type of habitat provides cover, nesting sites, and a variety of food sources for birds. For instance, ruffed grouse and turkeys use openings for nesting, brood rearing, and feeding. Additionally, white-eyed vireos are commonly found in the dense early-successional habitat found on powerlines, but not in clearcuts dominated by seedlings and saplings.

Most wildlife species use a variety of habitats and are not solely dependent on any one particular habitat type, making small openings in forested areas valuable for a wide variety of species. Black bears feed on forbs and berries in forest openings, but depend on acorns and other nuts found in mature forests during the fall. Some species of forest-dependent songbirds feed in openings in late summer following the breeding season.

Shrubland-dependent songbirds such as chestnut-sided warblers, prairie warblers, and blue-winged warblers often can successfully nest in small isolated patches of shrubs within forested openings. However, recent research has shown that some species, such as yellow-breasted chats, field sparrows, and orchard orioles, prefer larger areas of shrubland and young forest habitat, typically exceeding 12 acres. Early-successional habitat patches would need to be clustered together and of greater size than the openings discussed here in order to be of greatest benefit to these species.

Species like indigo buntings, American goldfinches, bobwhite quail, and monarch butterflies are associated with the types of habitats typically found in small forest openings. For example, bobwhite quail relish ragweed seeds and poison ivy berries, American goldfinches favor bull thistle seeds, monarch butterflies rely on milkweeds, and black-capped chickadees peck out insect larvae from the swollen stems of goldenrods. All of these plants are commonly found in small forest openings. Turkeys, quail, and grouse use openings and nearby edges for nesting, brood rearing and feeding, while white-tailed deer use them for browsing and cover.



Figure 1. Examples of species that benefit from small forest openings include blue-winged warblers (a) and monarch butterflies (b). Photos by Paul Fusco.

Obviously, which wildlife species will use a particular opening depends on a variety of factors, including the type of habitat provided by the opening, proximity to and arrangement with other habitat types (including other early-successional habitats), the types of wildlife locally and regionally present, topography, hydrology, etc. Highly mobile species like deer, turkeys, and woodcock exploit small openings interspersed in a large area of forestland, but less mobile species like cottontail rabbits benefit by providing larger areas of early-successional habitat and young forests in close proximity.

Edge habitat

Edge is the interface between two habitat types, plant communities or successional stages, and is created when forest openings are made. Edge also occurs where two different patches of habitat meet or where forest stand conditions are markedly different, such as where mature forest meets seedling/sapling forest. Edges are unique; they usually contain a high diversity of vegetative species because plants characteristic of both habitat types are present. High plant diversity results in higher structural diversity, which can create very desirable conditions for some species of wildlife, especially those that have small home ranges and thrive in early-successional and young forest habitat.

Edges may be very abrupt or they may be feathered. Feathered edges gradually blend into each other. The value of feathered edges depends on how gradual the transition is (e.g., how gradually the forest becomes a field). The greater the variety of native plants and the more vertical and horizontal diversity found in an edge, the more valuable it is for wildlife in general. Feathered edges can be created through a variety of techniques but typically must be maintained through active management. Many species including ruffed grouse, bobwhite quail, turkeys, white-tailed deer, rabbits, raccoons, foxes, coyotes, song sparrows, brown thrashers, gray catbirds, indigo buntings, and red-tailed hawks benefit from the presence of feathered edges.

Pros and cons of creating openings

Management of early-successional habitats is a priority for many land managers because of the marked decline of many of the species dependent on them. However, many species of wildlife do not benefit from the creation of openings in forestland and an increase in edge. Depending on what the surrounding landscape looks like, species that require large unbroken expanses of forestland to produce viable populations may not benefit from the creation of forest openings.

The effects of forest fragmentation on birds has been the subject of many studies. Most conclude that small forest stands surrounded by agriculture or development result in dire consequences for the birds attempting to use them. Creating a small forest opening in an already small forest block will just contribute to the birds' demise. On the other hand, small forest openings in large, unfragmented blocks of forested habitat will actually benefit a number of species and may even benefit some songbirds that require large expanses of forest.

For example, if you owned 100 acres of wooded habitat surrounded by primarily agricultural land, placing permanent openings in the woodland would be of minimal value. On the other hand, if you owned 100 acres of mature forested habitat and much of the surrounding land was forested, creating some small permanent openings would greatly benefit a variety of species. The conservation of large areas of forestland, while vitally important and necessary, must be balanced with the need to manage early-successional habitats and the host of species, both common and uncommon, that are dependent on them.

Before implementing management actions, the landowner or manager should establish clear objectives based on an assessment of the quality and quantity of existing habitats, natural features, juxtaposition of those habitats and features on the property, wildlife species currently using the property and those with the potential to use the property based on the habitat present. This assessment must be made with consideration to neighboring habitats and in view of the larger landscape. State wildlife agency biologists or Cooperative Extension wildlife specialists may be able to provide technical assistance to help with the planning and implementation of openings for wildlife based on local, state, and regional objectives.

Types of small forest openings

There are three main types of small forest openings: herbaceous, successional, and planted food plots.

Herbaceous

Herbaceous openings are permanently maintained and contain grasses, herbaceous plants, wildflowers, legumes, or some combination of these. Permanent herbaceous openings provide good food sources, nesting sites, and escape cover for ruby-throated hummingbirds, broad-winged hawks, deer, black bears, red foxes, chipmunks, and other wildlife. Insects thrive in open, sunny herbaceous conditions that also provide important high-protein food for growing grouse chicks, turkey poults, and songbirds.

Successional

Successional openings are those that are permanently maintained to encourage an early-successional mix of grasses and herbaceous plants, shrubs, and some seedlings and saplings. In these openings you may find shrubs such as pokeberry, raspberry and blackberry, and seedlings and saplings that provide nesting habitat for indigo buntings, feeding areas for woodcock, black bears, white-tailed deer, coyotes, and ruffed grouse, and cover for snakes and small mammals. Openings containing both herbaceous vegetation and shrubs are generally the most valuable for wildlife, because of the vegetative diversity and amount of food that they provide.

Food plots

Food plots are openings that are periodically planted with an agricultural crop desired by wildlife (sorghum, oats, soybeans, sugar beets). These areas must be prepared for planting much like an agricultural field. The site must be free enough of rocks and stumps so that it can be plowed and/or harrowed and possibly raked after seeding. Single, small isolated food plots that contain an annual crop like sorghum or sugar beets have little impact on the overall supply of food and typically benefit only a small number of individual animals. If wildlife populations become concentrated around food plots, predation can increase in and around that area. In order to significantly improve the level of nutrition for any particular wildlife species, about 10% of the land base needs to be cultivated and dedicated solely to that species. In some localities with high deer concentrations, deer may eat the food plot before it even develops or matures. Nonetheless, if wildlife viewing and hunting opportunities are your objectives, small wildlife food plots can help supplement naturally available foods and attract wildlife to your property.

Creation and site preparation

New permanent openings can be created through management of log landings created during forestry operations, and expansion of existing openings such as former homestead sites and small overgrown old fields. To create an opening, all overstory trees must be removed and the site cleared of tree stumps, rocks and other debris. The most efficient way to accomplish this is with a bulldozer. Clearing and bulldozing the site exposes mineral soil for natural regeneration or seeding and smooths the site enough to allow for future maintenance mowing. However, doing so will also create a perfect seedbed for the invasion of exotic plants that can eventually take over the opening. As such, it is advisable to address any invasive exotic plant issues prior to clearing. Refer to chapter 8 for more on invasive exotic plants and the herbiciding section of chapter 10 for invasive exotic plant control options.

In the Northeast, cleared areas do not necessarily need to be seeded because they typically resprout to a mix of herbaceous plants, briars, and eventually saplings and trees depending on the region and seed source. Some research has shown that areas allowed to regrow to native herbaceous plants and shrubs are more valuable than those that are planted with a conservation mix (commercially available mixes containing rye, various cool-season grasses and a legume like clover). However, in areas prone to erosion, seeding with at least an annual cover crop such as winter rye is advisable. Ultimately, the decision of whether to seed the prepared site should be based on management objectives and site conditions.

If creating a food plot, the site needs to be prepared by disking, liming, fertilizing, disking again, and seeding. Commonly used seeds include ladino or white clover, bird's-foot trefoil, Canada rye, smooth brome grass, switchgrass, and various types of conservation mixes. Warm-season grasses or cool-season grasses can be used, depending on site conditions and management objectives. Wildflowers can be planted to increase the attractiveness of an opening for insects, especially butterflies. A mix of seeds is always preferred, because it provides a greater variety of food and cover.

Recommended seed types and planting specifics will vary depending on locality, soil type, hydrology, and the habitat management goals of the landowner or land manager. The Natural Resources Conservation Service (NRCS), state wildlife agency, and/or Cooperative Extension office may be able to provide technical assistance on site preparation, planting, and the best seeding mixture to use for meeting your habitat management goals. If necessary, soils can be tested for lime and fertilizer requirements through the local NRCS or Cooperative Extension office.

Log landings

One of the most efficient ways to create a permanent opening is through a planned forestry operation. Log landings can be created and/or managed to provide permanent openings. Landowners or managers can specify that loggers remove rocks and other debris from the log landing, exposing mineral soil. Loggers

can prepare the site adequately by back-blading with the skidder before leaving the job site. The cost of this process can be absorbed in the sale of the logs. Log landings can purposely be made larger to provide greater benefits to wildlife. Once the site has been prepared, it can be planted with a seed mixture chosen based on the management goals for the property or left fallow to resprout to herbaceous growth, briars, and seedling- or sapling-sized trees.

If there are few shrubs in the area to naturally seed in or you just want to ensure that highly desirable shrubs become established, native shrubs can be planted on the site. Fruit-producing shrubs such as dogwoods, viburnums, serviceberry, and blueberry are excellent choices for planting. Small clumps of evergreens can also be planted in openings to provide cover. However, once an evergreen has reached 10 to 12 feet, it should be cut back to about four feet (topped) to keep cover close to the ground, otherwise it will grow up to dominate and shade the herbaceous growth in the opening. A relatively inexpensive source for tree and shrub seedlings may be your state nursery. Check with your state's forestry department to see if a nursery exists in your state.

Placement of openings

Placement of temporary openings will depend to a large extent on the amount of land being managed, existing habitat conditions, and the species being managed for. Generally, for species with small home ranges (e.g. rabbits, woodchucks, small mammals), creating both permanent and temporary openings in close proximity to one another and close to other early-successional habitat is preferred. A larger area of successional and young forest habitat allows for more individual species to breed and produce offspring, because it provides more space for individual territories. More habitat resources are present in a concentrated location, making it easier for species to meet their food and cover needs. Additionally, species with small home ranges will have an easier time finding and colonizing the newly created temporary opening if they do not have to travel long distances. Concentrating early-successional habitat in one area also leaves mature blocks of forestland unfragmented, which benefits area-sensitive species.

On the other hand, highly mobile animals such as deer, turkeys, ruffed grouse, bears, and some species of birds will readily use widely scattered openings. Assess your current habitat conditions in conjunction with your management objectives to help decide where and how to create, reclaim, or manage openings. In general, large forested areas of at least 1,000 acres should maintain at least 5% of the total acreage in permanent openings. Of this, at least 2% of the total acreage should be managed for permanent herbaceous cover.

When creating new permanent openings, look for areas that are relatively flat (less than 6% slope) and cut the opening so that it has an east-west orientation to allow maximum sunlight exposure. South-facing slopes are preferred, as they tend to receive more hours of direct sunlight per day and remain free from snow for longer periods of time in early spring and fall. Sites with good soil make the best permanent openings. Flat to gently sloping areas will be less prone to erosion if they are plowed or disked before planting, and will be easier to maintain once they are established.

The size of openings should be dictated primarily by the species or suite of species being managed. In general, openings should be no less than 1/4 acre in size but can range up to several acres in size. Smaller openings of 1/4 to 2 acres are usually feasible for a landowner to create and maintain on their own and are very beneficial to a variety of species.

Maintaining openings

Once established or reclaimed, openings will need to be maintained through one or more of the following: periodically mowing, prescribed burning, hand cutting and/or herbiciding. Maintenance is critical to prevent succession into mature forestland.

Mowing

Many permanent openings can be maintained through periodic mowing. A tractor and brush hog are the most efficient tools for mowing openings. Brush hogs are readily available that can cut woody stems up to three inches in diameter and cut herbaceous vegetation at the same time. If managing for an herbaceous opening, mow every two to three years to prevent woody growth from invading. If the goal is to maintain a successional opening, mow every three to six years depending on the growth rate of woody plants at the site.

If the objective is to allow for the completion of breeding, nesting, and rearing activities of wildlife, maintenance mowing should be done after August 15 but before April 15 of the following year. This is when many species start breeding again. If the objective is to have some growth return to provide food and cover during the fall and winter, mow during August but prior to September so that some vegetation can grow back. If the objective is to maximize seed production for game birds, herbaceous openings should be mowed after July 1 but before August 15. This allows game birds to complete their nesting cycle, but provides for succulent new growth and a flush of insects in late summer.

Prescribed burning

Depending on location, site conditions, and regulations, prescribed burning may be an excellent option to maintain an opening. Burning done in the springtime will help maintain the current vegetative state. Summer burns are more efficient at killing woody material and setting back succession, but may not be feasible due to the smoke and potential of exceeding federal and state air quality standards.

Burning can enhance habitat quality by improving the nutrient levels and palatability of wildlife foods. It removes litter, making foods easier to find for some species such as bobwhite quail and allowing new vegetation to sprout, attracting and producing an abundant insect population. Ash and various minerals are released, stimulating valuable nitrogen build-up in the soil. Refer to the prescribed burning section of chapter 10 for more information.

Herbiciding

Herbicides can be used to manage successional habitat and to control invasions of certain exotic plant species that can easily colonize openings during and after their creation. Generally, herbicides are applied to the foliage or to the cut stem of a shrub or tree. The type of herbicide and method of application should be decided on a case-by-case basis. Refer to chapters 8 and 10 for thorough discussions on invasive exotic plants and the use of herbicides, respectively.

Food plots

Food plots require a considerable amount of effort to establish and maintain. These openings will need to be disked, seeded, and possibly fertilized every year. Annual or periodic disking leaves some soil exposed beneath the new growth, creating highly desirable conditions for many species including bobwhite quail. The local NRCS office is an important resource to obtain the planting requirements of various agricultural crops.

Reclaiming existing sites

Old existing openings that have grown beyond the stage of providing high-quality early-successional habitat can be reclaimed if desired. These areas generally still have some herbaceous growth in the understory and may even still contain some shrub growth, but may have become dominated by large saplings, or pole-sized trees. Removing the larger trees will increase the amount of sunlight that reaches the ground, stimulating herbaceous growth and providing the necessary light to allow shrubs to thrive. When managing for early-successional habitat, concentrate on removing trees three to four inches in diameter and larger. Old homestead

sites, old fields, and overgrown orchards can be cleared of unwanted trees and mowed to remove overgrown herbaceous growth.

The scale of the project, the size of the trees to be cut, and available resources will dictate how the opening will be reclaimed. Individual trees can be cleared with a chainsaw. Trees three inches or less in diameter can be cleared with most commercially available brush hogs. Sites to be mowed with a tractor and brush hog should be relatively clear of rocks. Previous openings were likely cleared of debris when they were created, so mowing should be an option. All trees larger than 3 inches in diameter should be removed, unless they have overriding wildlife value (den trees, apple or other fruit trees, or trees containing vines). The goal should be to re-open the area to sunlight so that herbaceous growth is stimulated and not shaded out by large trees.

In some instances, machinery larger than a tractor and brush hog may be needed to remove trees, tangles of multiflora rose, or other vegetation that is difficult to remove. A heavy duty Brontosaurus or other suitable equipment may be required (see the mechanical tools section of chapter 10 for additional options). Once the site has been cut, it can be brush-hogged on a periodic basis, depending on what stage of growth is desired.

Management of edges

Edges can be improved by making them more feathered. The forest edge should grade from mature trees into smaller diameter trees, then into shrubs, brush, and finally herbaceous growth. If you have an abrupt edge between mature forest and a field, feathering can be achieved over time by cutting back into the forest edge via selective hand cutting, girdling, or mowing with a Brontosaurus, and then allowing young trees to sprout or grow if already present. Approximately 30 feet of the field edge can be left to grow up into herbaceous plants and mowed every two to four years. If few shrubs invade the edge, valuable food-producing shrubs can be planted to help with the creation of a high-quality feathered edge.

Edges need to be maintained by periodic cutting, as trees become too large and shade out desirable growth. Without maintenance, edges will continue to creep into the permanent opening, eventually eliminating it. Periodic cutting of edges should be done in stages so that there is always some of this habitat available, some growing back and some ready to be cut.

Although typically less than a few acres in size, small forest openings can provide extremely valuable early-successional habitat if managed correctly and placed in the right location. Creating a small forest opening in an already small forest block may not be wise because doing so may lead to higher predation rates of the birds and small mammals attempting to use it. However, a small forest opening in a large, unfragmented block of forest will benefit a number of species, even those songbirds thought to require large expanses of forest such as scarlet tanagers and wood thrushes. In such a setting, a small forest opening can be a supermarket of food compared to that typically found in a closed canopy forest. Raspberries and pokeweed berries provide food for bears and songbirds, while abundant insect populations provide food for grouse, turkey, and flycatchers. By using the techniques outlined in this chapter, you can ensure an important and stable food source for these and other species.

Suggested reading

DeGraaf, R.M. and M. Yamasaki. 2001. New England wildlife: habitat, natural history, and distribution. University Press of New England.

Kentucky Department of Fish and Wildlife Resources. Undated. Habitat Improvement Program - mowing. 4 pp. <http://fw.ky.gov/mowing.asp>

Kentucky Department of Fish and Wildlife Resources. Undated. Habitat Improvement Program – forest openings. 6 pp. <http://fw.ky.gov/forest.asp>

Masters, R., S. Ditchoff, and S.C. Farley. Undated. Wildlife Management Notes No. 10: edge and other wildlife concepts. Oklahoma Cooperative Extension Service. <http://pearl.agcomm.okstate.edu/wildlife/1-276.html>

Michigan United Conservation Clubs and the Michigan Department of Natural Resources. 2002. A landowners guide to habitat management.

Tucker, J.W. Jr. 1992. Wildlife use of log landings in the White Mountain National Forest. M.S. Thesis. University of New Hampshire, Durham, NH.

Stewart, D. Undated. Forest management strategies for bobwhite quail. Mississippi Extension Service. 5 pp.

Wildlife Society Bulletin. 2001. Volume 29. Special issue on managing early-successional habitats in the Northeast.

Biography

Judy Wilson is the Private Lands Program Coordinator for the Connecticut DEP Wildlife Division. She earned her B.S. degree in Wildlife Management from the University of New Hampshire in 1982 and an M.S. in Natural Resource Management, specializing in wildlife, from the University of Connecticut in 2004. Judy began her career as the Eastern District Biologist in 1985 and in 1987 went to work as the Western District Biologist before assuming her current position in 2003.