

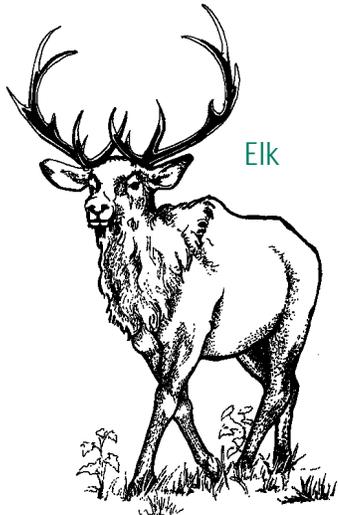
FOREST OPENINGS



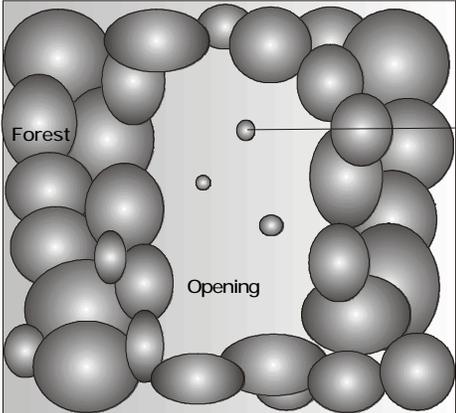
Prior to Michigan's settlement millions of acres of pine and hardwood forest covered the landscape. Approximately 150 years ago these expansive tracts of forest contained patches of scattered grass or shrubland openings. These openings were created by natural disturbances such as fire, ice storms, wind, disease, insect outbreaks, drought, and flooding. These disturbances provided more sunlight and moisture to the forest floor, reduced competing vegetation, and generated a suitable seed bed for colonizing grasses, shrubs, and trees. Over time, shrubs and small trees would dominate the site and often in 10 -15 years trees would once again cover the area. These temporary openings provided browse, food, and cover to a variety of wildlife such as ruffed grouse, white-tailed deer, elk, and rabbits. Examples of larger open areas that fit into Michigan's highly forested landscape are native

prairies, oak and pine savannas, and wetlands. These areas experienced more frequent disturbances, and thus had fewer trees.

Michigan's forests have greatly changed since the early 1800's. The majority of the vast forests in southern Michigan have been lost to development. However, northern Michigan still remains largely forested. Even so, many of the remaining forests in Michigan are severely fragmented. Fragmentation occurs when roads, trails, homes, agricultural fields, pipeline and powerline corridors, and other forms of development break up a natural area. Fragmentation produces a large amount of edge. Edge is the transition zone between two vegetation types. As a result of fragmentation, many species that have a high sensitivity to edge have been negatively impacted. These species seek the interior of large forested areas hundreds of acres in size. When edge sensitive woodland birds are forced to nest within



story vegetation. This is because the overstory prevents sunlight from reaching the forest floor. When openings are created, sunlight is able to facilitate the growth of a variety of vegetation. A one acre opening, with full sunlight, will produce significant food for species such as deer, elk, hares, vireos, warblers, and thrushes. Selecting where to place an opening is important because location, size, and slope will determine how the opening gets sunlight. In addition to this, it important to know when creating openings will be beneficial or detrimental to the ecosystem.



300 yards of large openings or grassland edges, they become vulnerable to predation and nest parasitism by cowbirds.

Species of wildlife such as the least flycatcher, redstart, ovenbird, veery, and red-shouldered hawk can all be negatively impacted by the development of forest openings.

← 150 ft →

A forest with a full canopy does not generally have a lot of under-

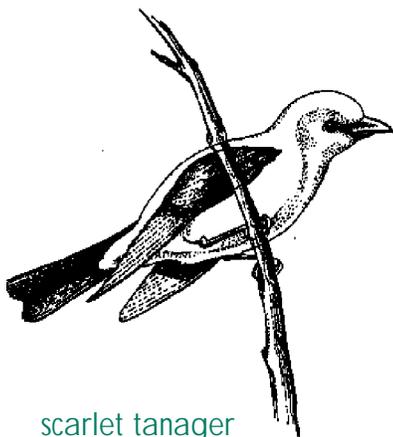
When to Create Openings

Landowners must consider many factors before deciding when creating openings is needed, and how large they should be. The lack of mature, old growth forest, and rarity of many types of forest

should be taken into consideration before any opening is planned. Maintaining and restoring these types of forest may be the best alternative. Whenever trees are harvested, whether the stand is 80 acres or over 200 acres, the kind and number of wildlife will change. Species that require large, undisturbed blocks of forest, may not be able to survive in the area if the disturbance is too large.

Because of the large amount of fragmentation, especially in southern Michigan, you must examine surrounding landscapes before creating openings. In general, forest openings should not be developed in extensively fragmented landscapes. It may be better in these areas to connect existing fragments rather than fragment the forest further by creating openings. If you are not managing for edge dependent species, openings are unnecessary in forest tracts less than 100 acres in size since openings and fields commonly already exist around them.

However, there are instances where creating openings may be beneficial to wildlife or habitat diversity. For example, areas that were historically prairies and savanna's are ideal locations for creating



scarlet tanager

forest openings. Forest openings would mimic these unique grassland communities and would restore them to the area. Edges and openings of forests provide a large variety of vegetation and, consequently, support a variety of wildlife. The management of forest openings has been traditionally conducted for game and edge dependent species such as deer, turkeys, ruffed grouse, elk, rabbits, snowshoe hares, and songbirds such as towhees, indigo buntings, cardinals, and chipping sparrows.

Some openings may already exist on your property. You should determine the amount of existing openings in your forest before creating new openings. If your forest already contains the necessary amount of openings, you can enhance them instead of creating more. This will avoid fragmenting your forest, while fulfilling your goals for edge dependent species. Blowdowns from storms and fires from lightning strikes are examples of naturally created openings. Logging trails and log landings (where logs are piled and loaded) are examples of human created openings. These openings can simply be maintained or enhanced to fulfill wildlife needs.

Management Considerations

LOCATION: The best places for creating forest openings are where there are already only a few existing trees. Considerations include frost pockets (areas prone to late spring frosts), sites with shallow soil, and those that are excessively well-drained. If your property is large, you can often find good sites



for openings on soil maps, aerial photographs, or topographic maps. A field examination will confirm whether or not the location is suitable.

To minimize the impact of the opening to area sensitive species you should place openings near other existing openings such as roads and trails or areas prone to windthrow. Enhancement of an existing opening will have less of a negative impact than creating a new opening. Also, openings should be placed near the edge of the forest, versus the middle, to minimize any negative impacts caused by increased fragmentation.

SLOPE: Slope is an important consideration when deciding on an opening location as it determines how much sunlight the opening will receive, and thus the potential for diverse vegetation growth. A south facing slope is the most desirable location because it will provide more ground area exposed to sunlight. However, it will tend to be drier because of summer heat. In early spring many species will use openings with a south-facing slope because green browse will appear there first as the snow melts. Areas

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with moderate or low slope should be chosen if the area is to be planted. Areas with steep slopes are harder to plant and may cause erosion problems if not quickly revegetated.

SIZE: Openings are usually created to allow for maximum plant growth and diversity. A 1/2 to 2 acre opening will allow both shade tolerant and intolerant species. Sun-loving species such as grasses, legumes, crabapples, hawthorn, sumac, and gray and silky dogwood will grow in the middle and north side of the clearing as these areas receive the most sunlight. Shade tolerant species such as beaked hazel, serviceberry, flowering dogwood, and highbush cranberry will grow in the shade from adjacent trees on the south end of the clearing. Openings smaller than 1/2 acre will only support shade tolerant species as they are too small to receive much sun. Openings larger than two acres support more shade intolerant species as they have only a small shaded area.

When managing for edge dependent species, about five to 10 percent of your forest should be in openings. If you own more than 100 acres of woods, five to eight acres of openings are ideal. One option is to maintain five to eight one acre openings, while another option is to maintain three or four two acre openings.



Openings should be at least twice as long as they are wide because small animals seldom venture more than 50 feet from escape cover. An opening that is 100 feet wide by 200 feet long will be about 1/2 acre in size. Extending the length to 300 feet will produce an opening of 3/4 acre. An opening of 100 feet by 400 feet is about one acre. Long, rectangular shaped openings will maximize the amount of edge. Square and circular openings will minimize the edge effect. Openings should be about 100 feet wide to provide nearby escape cover and create an even amount of shaded and sunlit areas. The amount of shaded area that will result from a stand can be determined by the height of the trees. A tree will produce shade equal to half of its height. For example, trees that are 70 feet tall will produce 35 feet of shade into the opening.

When the width of the opening is narrow, there will be more time that the opening will be shaded. For example, a half-acre opening that is only 100 feet wide will be in the shade for more than half of the daylight hours. Increasing the width will allow a greater share of the opening to receive full sunlight. But don't always limit yourself to straight-sided rectangular openings. Be creative: Nature seldom creates straight lines, and neither should you.

MAINTENANCE: Once openings have been established, you have several options to maintaining them. You can either leave it alone and let succession reestablish it with trees, manage it as brushland, or manage it as a grassland. Your decision will depend on your management goals.



raspberry

If you allow the site to regrow with trees, the opening's effect on some wildlife species will last less than 15 years. Deer, rabbits, grouse, cardinals, towhees, and certain other songbirds will use the rapidly closing open area, but if you wish to retain high populations of these species, you will need to create another opening every five to eight years. If your goal is to introduce native species of desirable trees (hickory, red oak) and shrubs (serviceberry, beaked hazel) to your forest, this prescription is ideal.

If you wish to establish the opening as a brushland or grassland, you will have to prevent succession from going past these stages. You may have to kill the stumps of the cut trees to prevent their regrowth. This usually requires a specialty herbicide. To find out what herbicide is best for your opening, contact the Michigan State University Extension office in your county. Be sure to read, and follow all container directions. Once stumps are dead, sun loving grasses, broadleaf annuals and perennials will quickly fill the site, along with raspberries, blueberries, and shrubs. Allow the site to progress in natural succession as far as you want. When succession has reached the stage you desire, set it back by disking or mowing every three to five years, depending on soil moisture (moist soils

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diagram of a brushpile

increase the rate of succession). Mark any trees and shrubs you have planted to avoid damage while disking or mowing.

Removing the stumps with a bulldozer, stump rake, or stump grinder will allow you to plant the opening with grasses or forbs. Mixes of native grasses and forbs such as Canada wild-rye, little bluestem, Indiangrass, and bush clover are preferred. Other alternatives, that are not native to Michigan, include timothy grass, orchard grass, and many clovers. Before planting, determine soil pH through the extension service, and apply fertilizer and lime, at the rates recommended. Adding wildflowers, and fruit bearing trees and shrubs, not only increases the aesthetic value of an opening but will attract a greater variety of wildlife, including bees, moths, and butterflies. Refer to the **Grassland**

Management section for more information.

GENERAL: When cutting trees to create openings save some snags (dead trees) and wolf trees (large, wide spreading, short-trunked trees) near edges as many species of wildlife use the cavities often found in them for shelter. Leave clumps of conifers in and around openings because they provide escape cover and shelter for wildlife. In openings greater than two acres in size you can also leave a clump of trees or shrubs in the middle. Leaving some of the slash on the ground provides habitat for amphibians and reptiles. The addition of brush piles along the forest edge gives rabbits, snakes, turtles, grouse, and chipmunks additional high-quality escape cover next to food producing edges. Landowners can enhance fruit production along the edges, as well as reduce a

harsh edge by planting sun-loving fruit bearing shrubs along the north side of the opening and shade-tolerant species within the shaded zone of trees along the south side.

In summary, the decision to create openings in your forest depends on your management goals and your surrounding landscape. Forest openings can increase habitat diversity for many species of wildlife. However, they can also have negative impacts on other wildlife species. By carefully developing your goals you can determine if the practice will be beneficial on your property and produce your desired results, or if it will be detrimental to the ecosystem.

FOR ADDITIONAL CHAPTERS CONTACT:

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Private Land Partnerships: This partnership was formed between both private and public organizations in order to address private lands wildlife issues. Individuals share resources, information, and expertise. This landowner's guide has been a combined effort between these groups working towards one goal: Natural Resources Education. We hope this manual provides you with the knowledge and the motivation to make positive changes for our environment.

FOR ADDITIONAL ASSISTANCE: CONTACT YOUR LOCAL CONSERVATION DISTRICT