Forest Openings

Openings in the forest canopy occur naturally due to overstory tree loss from insects, fire, storms, and disease. These gaps are generally occupied by a mixture of tree seedlings, shrubs, grasses, and/or broadleaf plants that contribute to the diversity of the forest and provide valuable habitat for many species of wildlife including reptiles, deer, elk, turkeys, grouse, bats, rabbits, quail, woodcock, and a variety of songbirds. In areas of extensive, unbroken forest cover, openings can be created and managed to provide high quality habitat for wildlife. However, in areas where the forest has already been extensively fragmented and existing blocks of woods are generally less than 50 acres in size, unbroken woodlands can be more beneficial to wildlife than openings and therefore, the creation of more openings should be avoided.

Location of Forest Openings

Existing openings should be identified first. Avoid creating new openings when there are already openings present, such as log yards ("landings"), logging roads (Figure 1), old home sites, old fields, and utility rights-of-way.

When creating new openings, look for areas that are relatively flat (less than 6 percent slope). Flatter areas in a woodland can often be found near drainages, on benches, and on ridge tops. Sites with little slope generally have better soils, less soil erosion problems, and more planting options than steeper sites. When openings are created near drainages, a forested buffer should be maintained for proper streamside management*.

Avoid sites with large trees or with trees that may have important economic or wildlife qualities. Areas that have been damaged from severe weather or insects should be considered first, as well as sites where the majority of trees present are in the sapling to pole size range (2" to 10" in diameter at breast height). It is much cheaper, easier, and better for most wildlife to work with these types of sites than to disturb valuable forested habitat.

Finally, if an opening is to be actively

Figure 1. Logging road managed as a forest opening.

Figure 2. A forest opening being created in an ice and snow damaged pine stand with a bulldozer.

managed, the site selected must be easily and permanently accessible with necessary equipment. If you can't get to it, you can't manage it.

Size, Orientation, & Number of Forest Openings

Avoid creating excessively large openings or developing too many openings. New openings should be at least one-quarter acre, but less than one acre in size and oriented in an east/west direction for maximum sunlight. An opening needs to be large enough to allow adequate sunlight, but small enough to minimize forest fragmentation, provide seclusion for foraging wildlife, and keep costs reasonable. New openings can be irregular in shape, but should be at least as wide as one and one-half times the height of adjoining trees to avoid excessive shading. Several smaller openings are preferable to one large opening. In general, no more than 6 openings per 100 acres of woodland should be created and no more than 2 acres total.

Site Preparation

When creating forest openings, a bulldozer is typically used to clear off woody vegetation (Figure 2). Many woodlands have only a thin layer of topsoil, so care should be taken to remove as little soil as possible when clearing. Consider harvesting any marketable trees prior to clearing. As long as there is enough sunlight, all of the vegetation does not have to be removed. You may want to leave a few good mast (fruit edible to wildlife) producing trees, such as white oak or red oak, or shrubs, such as flowering dogwood, in openings. After the dozing is complete, finishing work with a disk is usually necessary to smooth over rough sections and "work down" any remaining small roots and stems.

Forest openings can also be manually cleared using a chainsaw. Although this technique is more tedious, it has a less dramatic impact on your woodland and is particularly appropriate if the site is going to be allowed to revegetate naturally.

If undesirable vegetation such as fescue or sericea lespedeza is present in existing openings, mowing*, herbicide treatment, and/or tillage may be necessary to prepare the site for planting or natural revegetation* (see *Habitat How-To* entitled Fescue Eradication if tall fescue is present).

Openings in the forest canopy occur naturally due to overstory tree loss from insects, fire, storms, and disease.

Natural Revegetation

One of the simplest methods of establishing desirable cover in forest openings is to allow natural revegetation*. With no active management, most forest openings in Kentucky will revegetate to a dense mixture of blackberry, greenbrier, seedlings of light seeded or "pioneer trees" such as yellow poplar, maple, ash, and sassafras, mixed annual grasses, and annual broadleaf plants. Thick brushy openings provide excellent habitat for grouse, woodcock, rabbit, and deer. Openings that are allowed to naturally revegetate can be mowed every 3 to 4 years to maintain a dense early succession habitat or simply allowed to re-

generate into forested habitat (see *Habitat How-To* entitled Forest Regeneration). On sites where natural regeneration is marginal, planting trees and shrubs* can supplement natural revegetation. Planting oaks, dogwood, viburnum, hawthorn, or wild plum into regenerating areas lacking these species can enhance existing habitat.

Plantings

Forest openings that are not left to naturally revegetate can be planted to legumes, cool season grasses, warm season grasses, annual grains, or mixed plantings (Table 1).

Legumes*

Legumes (nitrogen-fixing plants such as clover and annual lespedezas) provide excellent foraging areas for many wildlife species. Legumes support high insect populations that serve as forage for a variety of bird species. This is particularly true for the chicks of grouse, turkey, and quail that need the high protein content found in insects for rapid development and survival. Legumes also provide quality forage for forest herbivores such as deer and elk.

Cool Season Grasses*

Cool season grasses actively grow during the cooler months of the growing season, typically having peaks of growth in the spring and fall. Many wildlife species benefit from cool season grass plantings. They can provide quality foraging areas as well as important bugging areas for quail, grouse, and turkey chicks. If they are not cut too frequently, these mixtures also provide suitable nesting and other cover for a variety of animals.

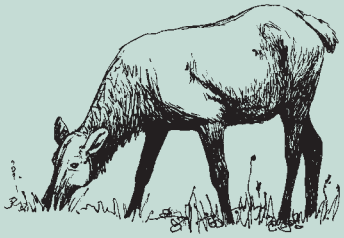
Native Warm Season Grasses*

Native warm season grasses (or "prairie grasses") actively grow during the hotter months of the growing season when most cool season grasses are dormant. Some of these grasses (Indiangrass, big bluestem, and little bluestem) are important components of the native plant communities found in many naturally occurring forest openings in Kentucky. Native warm season grasses grow in clumps and can provide excellent nesting habitat and year-round cover for wildlife. The structure of native warm season grass stands allows a diverse community of broadleaf plants such as legumes and wildflowers to exist between grass clumps, which creates an ideal environment for species such as grouse, quail, and turkey to forage and raise young.

Annual Grains*

Wildlife depend on and prefer the seeds, berries, and browse of native plants for winter food and cover. However, during severe winter weather when naturally occurring food sources are covered with ice or snow, many wildlife species benefit from standing grain. Crops to be used should be strong stemmed and high carbohydrate seed producing species such as grain sorghum (milo), corn, or millets. Grain plantings, with soybeans or other legumes included will also attract insects and provide quality forage throughout the growing season. Winter oats or wheat make good cover crops for legume and cool sea-

Excessive breaks, or openings in forested habitat can lead to fragmentation and a decline in wildlife species that depend on large blocks of forested habitat.



Forest openings can provide excellent wildlife viewing opportunities.

Figure 3. Wheat used as an annual grain planting on a logging road.

son grass plantings and work particularly well as quick inexpensive single species plantings when openings are prepared late in the summer or during fall (Figure 3).

One of the simplest and most economical methods of establishing cover in forest openings is to allow them to naturally revegetate.

Management Considerations

Pure legume plantings should be mowed* once or twice a year if weeds or grasses threaten to outgrow legumes. However, be aware that cutting clover during hot, dry weather weakens the plants and may result in a thinner stand the following year. To maintain plantings of grasses and legumes in predominantly herbaceous habitat, small openings should be mowed annually. If interspersed woody vegetation is desirable, mow the entire field every 5-7 years. For larger openings mowing can be done annually to 1/2 or 1/3 of the field so the entire field will be mowed every 2 to 3 years. This provides different levels of plant succession in close proximity while also having more winter cover available.

In some situations, with proper care and conditions, larger openings that have native warm season grasses can be managed using prescribed burning* to maintain diverse herbaceous vegetation.

Herbicide treatments are also an option for managing openings. Herbicides have been used for decades by right-of-way managers to control woody vegetation and promote herbaceous plants (see Kentucky Dept. of Fish and Wildlife publication *Managing Rights of Way for Wildlife in Kentucky*). Herbicides are also a valuable tool for controlling undesirable species such as tall fescue, sericea lespedeza, and Microstegium (Nepal or willow grass) which can occupy existing openings or quickly invade new plantings. For example, Poast® and/or Fusion® herbicides can be used to eradicate grasses from pure stands of clover.

To reduce the likelihood of failed plantings, soil amendments* will likely be necessary for cool season grasses, legumes, and annual grains. To determine the specific amount of lime and fertilizer needed, soil tests are recommended. Soil tests can keep you from applying more lime or fertilizer than is needed and therefore minimize your costs. However, in the absence of a soil test, generally you may apply 200 pounds of 10-10-10 fertilizer and 2 tons of lime per acre with positive results. Lime and fertilizer can be worked into the soil with a disk or drag.

The area where a forest opening and the forest meet is called "edge" habitat (Figure 4). Ideally, these edges should be gradual transitions between openings and forest habitat. Edge habitat associated with forest openings can be enhanced by selectively removing overstory trees around openings. This practice is called edge feathering*.

Figure 4. Good edge feathering with shrub row.

**Rates for Table 1 – Use lower end of range for seeding with no-till drills and mid to upper end of range for broadcast seeding. Reduce rates in proportion to the number of species in mixed plantings (by 1/2 for two species, 1/3 for 3 species, 1/4 for 4 species, etc.).*

Table 1. Forest Opening Planting Guide

SEED	PLANTING DATES Spring	Fall	RATE lb/ac*	REMARKS
LEGUMES				
Alfalfa	Mar 1- Apr 15	Aug 1- Sept 15	12 - 20	Mow during mid summer to stimulate new growth. Perennial.
Austrian Winter Pea		Aug 1- Oct 1	25 - 35	Annual planted as winter cover crop.
Birdsfoot Trefoil	Mar 1- Apr 15	Aug 1- Sept 15	6 - 12	Naturally reseeding perennial.
Red Clover	Feb 1- Apr 15	Aug 1- Sept 10	8 - 12	Reseeding perennial.
Alsike Clover			4 - 6	Perennial better adapted to poorly drained and acid soils than most clovers.
Ladino Clover	Feb 1- Apr 15	Aug 1- Sept 10	1 - 3	Hardy shade tolerant perennial.
White Dutch Clover	Feb 1- Apr 1	Aug 1- Sept 10	4	Perennial that will tolerate more shade than most clovers.
Korean Lespedeza	Feb 15- Apr 15		15 - 25	Hardy warm season annual.
Kobe Lespedeza	Feb 15- Apr 15		15 - 25	Hardy warm season annual.
Partridge Pea	Feb 15- Apr 15		10 - 15	Reseeding native legume. Light disking in early spring will stimulate germination.
Cow Peas	May 15- July 1		60	Warm season annual legume used in late summer or early fall.
COOL SEASON GRASSES				
Orchardgrass	Feb 1- Apr 15	Aug 20- Sept 15	10 - 15	Shade tolerant perennial.
Timothy	Feb 1- Apr 1	Aug 20- Oct 1	3 - 6	Perennial.
NATIVE WARM SEASON GRASSES				
Eastern Gamagrass	Apr 1- Jun 1	Nov 1- Feb 1	8	The seed has a hard coat. Cold or chemically treated seeds should be used for better germination. May also dormant plant in late fall through early spring.
Switchgrass	Apr 1- Jun 1		4 - 6	Produces abundant seed. Has a small hard seed and can be seeded with conventional seeders.
Indiangrass	Apr 1- Jun 1		6 - 8	Will tolerate poor soil conditions. Has fluffy seed and works best with seeders designed for handling fluffy seed.
Big Bluestem	Apr 1- Jun 1		6 - 8	Will tolerate acidic soils. Has fluffy seed and works best with seeders designed for handling fluffy seed.
Sideoats Grama	Apr 1- Jun 1		6	Small oat shaped seed feeds easily through conventional seeders.
Little Bluestem	Apr 1- Jun 1		6	Has fluffy seed and works best with seeders designed for handling fluffy seed.
ANNUAL GRAINS				
Grain Sorghum (Milo)	May 1- Jun 10		6 - 9	Can vary from 2 - 15 feet tall. Overseeding will result in poor growth and seed production.
Soybeans	May 1- July 1		12 - 15	Difficult to grow in small openings because of heavy deer browse.
Corn	Apr 1- May 30		10 - 18	
Browntop Millet	May 1- Aug 1		20 - 25	Shatters easily and will reseed.
Pearl Millet	May 1- Aug 1		20 - 25	Does not shatter easily and will hold seed longer into winter than other millets.
Proso Millet	May 1- Aug 1		20 - 25	Does well on dry sites.
Foxtail Millet	May 1- Aug 1		20 - 25	Common, German, and Hungarian are varieties.
Japanese Millet	May 1- Aug 1		20 - 25	Best millet for wet soils.
Oats	Mar 1- Apr 1	Sept 1- Oct 15	64 - 96	Used as cover or nurse crop.
Wheat		Sept 15- Oct 15	60 - 120	Used as cover or nurse crop. Easy to establish and requires little attention.
Sunflowers	Apr 1- May 10		10 - 15	Peredovic is generally the preferred variety.
Buck Wheat	Apr 1- July 20		30 - 60	Well adapted to many soil types. (One of the few species suited to mid summer planting.

SUMMARY OF OPTIONS:

Appropriateness of Openings
- Only in extensively wooded areas

Location of Openings
- Use existing openings first
- Avoid steep slopes

Size of Openings
- ¼ to 1 acre
- Width 1 ½ times height of surrounding trees

Number of Openings
- Maximum of 6, and 2 acres total, per 100 acres of woodland

Site Preparation
- Bulldozer
- Chainsaw
- Herbicide Treatment

Revegetation of Openings
- Natural
- Trees and Shrubs
- Legumes
- Cool Season Grasses
- Native Warm Season Grasses
- Annual Grains

Management of Openings
- Mowing
- Herbicide Treatments
- Lime and Fertilizer

***Related *Habitat How-To* references:**

Forest Regeneration
Trees and Shrubs
Legumes
Annual Grains
Cool Season Grasses
Soil Amendments
Native Warm Season Grasses
Prescribed Burning
Fescue Eradication
Streamside Management
Natural Revegetation
Edge Feathering
Food Plots
Mowing

Planning for My Property

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