

NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

Early Successional Habitat Development/Management

(Acre)

Code 647

DEFINITION

Manage early plant succession to benefit desired wildlife or natural communities.

PURPOSES

- Increase plant community diversity.
- Provide terrestrial wildlife or aquatic habitat for early successional species.
- Provide habitat for declining species.

CONDITIONS WHERE PRACTICE APPLIES

On all lands that are suitable for the kinds of wildlife and plant species that are desired.

CRITERIA - General criteria applicable to all purposes.

All planned work will comply with federal, state, and local laws and regulations.

Habitat will be managed so that soil loss does not exceed tolerable limits.

When this standard is being applied to grassland habitats, one or more of the following practices will be used to meet the intended purposes:

- Natural Succession
- Strip Disking
- Strip Spraying
- Strip Mowing
- Inter-seeding Forbs
- Prescribed Burning
- Prescribed Grazing

When this standard is being applied to woodland habitats, one or more of the following practices will be used to meet the intended purposes:

- Woodland Edge Feathering
- Forest Regeneration Opening

Establishment through Natural Succession

Agricultural management practices on existing crop fields will be terminated to allow natural plant succession to occur. The desired successional stage will be determined by the habitat needs of the target wildlife species. See Table 2 for characteristics of early successional stages.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

Indiana NRCS FOTG – August 2004.

Natural succession will be planned for the least erosive parts of fields and will not be planned where gully formation is a problem. A temporary cover, such as winter wheat or oats, will be established where erosion is a concern. See NRCS Field Office Technical Guide (FOTG) Standard 327 – *Conservation Cover* for additional guidance.

Spot spray or mow areas where noxious weeds, such as Canada thistle and Johnsongrass, or other invasive species, such as Reed Canarygrass, exist.

Other early successional management techniques such as Strip Disking, Strip Spraying, or Prescribed Burning will be utilized to maintain the desired successional stage.

Strip Disking

Management practices and activities will not disturb cover during the primary nesting period for grassland species of March 1 through July 15.

Maximum plant and animal diversity will be accomplished at the time of practice establishment by providing 40% – 70% bare soil, equally distributed throughout the area of disturbance.

1. Strips will be no wider than 50 feet.
2. Alternate the disked strips with undisturbed strips 2-4 times the width of the disked areas. Duplicate this pattern across the field.
3. Disked strips will be performed along field contours, or across the slope, when practical.
4. Strips will parallel brushy or woody escape cover when feasible.

A filter strip will be left adjacent to all water bodies to maintain water quality. See NRCS FOTG Standard 393 - *Filter Strip* for additional guidance.

Strip Spraying

If strip spraying is used during the primary nesting period for grassland species (March 1 through July 15), no more than 1/3 of the grassland acreage will be impacted during any one growing season.

1. Strips will be no wider than 50 feet.
2. Alternate the sprayed strips with undisturbed strips 2-4 times the width of the sprayed areas. Duplicate this pattern across the field.
3. Strips will parallel brushy or woody escape cover when feasible.
4. Sprayed strips will be performed along field contours, or across the slope, when practical.

A filter strip shall be left adjacent to all water bodies to maintain water quality. See NRCS FOTG Standard 393 - *Filter Strip* for additional guidance.

All manufacturers' label requirements will be followed when apply herbicides.

Strip Mowing

Management practices and activities will not disturb cover during the primary nesting period for grassland species of March 1 through July 15.

Strip Mowing will be used exclusively to control woody vegetation or to stress warm and cool season grasses.

Rotate fields through a 3-year mowing cycle.

Warm and cool season grasses will be mowed shorter than 6 inches to help thin a thick stand and encourage forb/legume establishment.

Inter-seeding Forbs/Legumes

This practice can be used in conjunction with other early successional management techniques such as Strip Disking, Strip Spraying, or Prescribed Burning. See Table 1 for appropriate forb species.

If inter-seeding is used during the primary nesting period for grassland species (March 1 through July 15), no more than 1/3 of the grassland acreage will be impacted during any one growing season.

1. Grassland fields must be established for a minimum of three years before initiating inter-seeding, and strips will not be disturbed more than once in a two-year period.
2. Inter-seeded fieldstrips will be a maximum of 50 feet wide. Alternate the strips with undisturbed strips 2-4 times the width of the inter-seeded areas. Duplicate this pattern across the field.
3. Inter-seeding operations will be performed along field contours, or across the slope, when practical.
4. Filter strips will be left adjacent to all water bodies to maintain water quality. See NRCS FOTG Standard 393 - *Filter Strip* for additional guidance.
5. Filter strips, riparian buffers, grassed waterways, contour buffers or areas planted to trees and/or shrubs will not be inter-seeded.
6. Strips will parallel brushy or woody escape cover when feasible.
7. Inoculate legume seeds with proper inoculant.

Prescribed Burning

If prescribed burning is used during the primary nesting period for grassland species (March 1 through July 15), no more than 1/3 of the grassland acreage will be impacted during any one growing season.

Perform summer/fall burns to promote forb/legume production and allow opportunity to inter-seed forbs/legumes.

See NRCS FOTG Standard 338 - *Prescribed Burning* for additional guidance.

Prescribed Grazing

If prescribed grazing is used during the primary nesting period for grassland species (March 1 through July 15), no more than 1/3 of the grassland acreage will be impacted during any one growing season. See NRCS FOTG Standard 528 – *Prescribed Grazing* for additional guidance.

An approved grazing plan is required to perform Prescribed Grazing.

Woodland Edge Feathering

The removal of woody vegetation will not occur from April 1 through July 30 to avoid the accidental taking of the endangered Indiana Bat (*Myotis sodalis*).

A feathered edge (up to 50 feet in width) will be created within the woodland perimeter of the site.

At the time of practice establishment:

1. Control all woody vegetation greater than 4 inches DBH (diameter breast height), and/or woody vegetation greater than 12 feet tall within the practice area.

2. Species greater than 10 inches in diameter (measured at 12 inches off the ground), and capable of coppice regeneration, will be cut at ground level, or no higher than 10 inches off the ground. See Table 3 for species capable of coppice regeneration.
3. Allow fruit bearing shrubs and small trees to grow.
4. Cut and treat all vines with herbicides that are labeled for this practice.

Woody vegetation will be controlled by using one or more of the following methods:

1. Mechanical: Including hand cutting, shearing, hydro-axe, disking, and other approved techniques.
2. Chemical: Including broadcast, spot, cut-stem treatments, or basal spraying.

Use the following key for **Soil Moisture Tolerance** listed in the tables below.

ED	=	Excessively Drained
WD	=	Well Drained
MWD	=	Moderately Well Drained
SPD	=	Somewhat Poorly Drained
PD	=	Poorly Drained
VPD	=	Very Poorly Drained

Table 1 – Forb List

Species	Soil Moisture Tolerance
Alfalfa (CSL) (<i>Medicago sativa</i>)	MWD – ED
Aster, Flat Topped (<i>Aster umbellatus</i>)	PD – SPD
Aster, New England (<i>Aster novaeangliae</i>)	PD – WD
Aster, Sky Blue (<i>Aster azureus</i>)	MWD - ED
Aster, Swamp (<i>Aster puniceus</i>)	PD – SPD
Blackeyed Susan (<i>Rudbeckia hirta</i>)	MWD-ED
Sweet Black-eyed Susan (<i>Rudbeckia subtomentosa</i>)	MWD - WD

Blazing Star, Button (<i>Liatris aspera</i>)	MWD – ED
Blazing Star, Dense (<i>Liatris spicata</i>)	PD – WD
Blazing Star, Prairie (<i>Liatris pycnostachya</i>)	PD - MWD
Blazing Star, Rough (<i>Liatris aspera</i>)	MWD - ED
Butterfly Weed (<i>Asclepias tuberosa</i>)	MWD – ED
Cardinal Flower (<i>Lobelia cardinalis</i>)	PD – SPD
Clover, Alsike (CSL) (<i>Trifolium hybridum</i>)	PD – WD
Clover, Ladino (CSL) (<i>Trifolium repens</i>)	PD – WD
Clover, Red (CSL) (<i>Trifolium pratense</i>)	MWD – WD
Clover, White (CSL) (<i>Trifolium repens</i>)	PD – WD
Coneflower, Gray-Headed (<i>Ratibida pinnata</i>)	MWD – ED
Coneflower, Pale Purple (<i>Echinacea pallida</i>)	MWD - ED
Coneflower, Purple (<i>Echinacea purpurea</i>)	MWD - ED
Coneflower, Yellow (<i>Ratibida pinnata</i>)	MWD - ED
Cup Plant (<i>Silphium perfoliatum</i>)	PD - MWD
Entire-Leaf Rosinweed (<i>Silphium integrifolium</i>)	MWD – ED
Foxglove Beardtongue (<i>Penstemon digitalis</i>)	SPD - MWD
Golden Alexander (<i>Zizia aurea</i>)	PD - MWD
Goldenrod, Riddell's (<i>Solidago riddelli</i>)	SPD – ED
Goldenrod, Rigid (<i>Solidago rigida</i>)	SPD - ED
Hoary Tick Trefoil (<i>Desmodium canescens</i>) (WSL)	MWD – ED
Illinois Bundleflower (<i>Desmanthus Illinoensis</i>)	MWD - ED
Indigo, White Wild (<i>Baptisia leucantha</i>) (L)	MWD – ED

Table 1 – Forb List (continued)

Species	Soil Moisture Tolerance
Indigo, Cream White (a.k.a. False White) (<i>Baptisia lactea</i>)	SPD - WD
Ironweed (<i>Vernonia fasciculata</i>)	PD - MWD
Lead Plant (<i>Amorpha canescens</i>)	WD – ED
Common, Kobe, or Marion Lespedeza (<i>Kummerowia striata</i>) (CSL) ¹	WD – ED
Lespedeza, Roundheaded (a.k.a. Bush Clover) (<i>Lespedeza Capitata</i>) (WSL)	MWD – ED
Lespedeza, Slender (<i>Lespedeza Virginica</i>) (WSL)	MWD – ED
Milkweed, Butterfly (<i>Asclepias tuberosa</i>)	MWD - ED
Milkweed, Swamp (<i>Asclepias incarnata</i>)	PD – SPD
Milkvetch, Canada (<i>Astragalus canadensis</i>)	SPD – WD
New Jersey Tea (<i>Ceanothus Americanus</i>)	MWD – ED
Nodding Bur Marigold (<i>Bidens cernua</i>)	PD – SPD
Obedient Plant (<i>Physostegia virginiana</i>)	PD – SPD
Ohio Spiderwort (<i>Tradescantia ohioensis</i>)	SPD – WD
Partridge Pea (<i>Cassia fasciculata</i>) (WSL)	MWD – ED
Prairie Clover, Purple (<i>Petalostemum purpureum</i>)	MWD - ED
Prairie Clover, White (<i>Petalostemum candidum</i>)	MWD - ED
Prairie Dock (<i>Silphium terebinthinaceum</i>)	SPD – ED

Rattlesnake Master (<i>Eryngium yuccifolium</i>)	MWD - WD
Sneezeweed (<i>Helenium autumnale</i>)	PD – SPD
Spotted Joe Pye Weed (<i>Eupatorium maculatum</i>)	PD – SPD
Starry Solomon's Seal (<i>Smilacina stellata</i>)	PD – ED
Sunflower, False (<i>Heliopsis helianthoides</i>)	MWD – ED
Sunflower, Sawtooth (<i>Helianthus grosseserratus</i>)	PD – WD
Tall Coreopsis (<i>Coreopsis tripteris</i>)	SPD – ED
Trefoil, Birdsfoot (CSL) (<i>Lotus corniculatus</i>)	MWD – WD
Tick Trefoil, Illinois (<i>Desmodium illinoense</i>)	WD - ED
Tick Trefoil, Showy (a.k.a. Canada) (<i>Desmodium canadense</i>)	SPD – WD
Vervain, Blue (<i>Verbena hastata</i>)	VPD - SPD
Vervain, Hoary (<i>Verbena stricta</i>)	MWD - ED
Virginia Blue Flag (<i>Iris virginica</i> var. <i>shrevei</i>)	PD – SPD
Virginia Mountain Mint (<i>Pycnanthemum virginica</i>)	SPD – WD
Wild Bergamot (<i>Monarda fistulosa</i>)	SPD – WD
Wild Quinine (<i>Parthenium integrifolium</i>)	MWD – ED
Wild Senna (<i>Cassia hebecarpa</i>) (WSL)	PD – WD

(WSL) = Warm Season Legume

(CSL) = Cool Season Legume

¹Substitutes for (CSL) *Lespedeza* must be used on sites north of Interstate 70.

Table 2 – Characteristics of Successional Stages

Stage of Succession	Years Needed to Reach Stages	Typical Plants	Benefits to Wildlife	Wildlife Benefited
Annual grasses and forbs	1	Giant foxtail, and common ragweed	Areas of bare soil for dusting, seeds and insects for food, and nesting cover	Quail, pheasant, turkey, and grassland songbirds
Perennial grasses and forbs	2-5	Warm and cool season grasses, goldenrod, milkweed, daisys, and ironweed	Nesting cover, green browse, and insects	Quail, pheasant, turkey, rabbit, deer, grassland songbirds, and snakes
Briars, brambles, vines and shrubs	3-10	Blackberry, raspberry, dewberry, roses, grapevines, dogwoods, sumacks and red cedar	Escape, nesting and winter cover, berries, fruits, buds, and green browse	Quail, pheasant, turkey, rabbit, deer, songbirds, woodcock and snakes

Table 3 - Species capable of coppice regeneration

Common Name	Scientific Name	Growth Form	Note
Ash, Green	<i>Fraxinus pennsylvanica</i>	Tree	
Ash, White	<i>Fraxinus americana</i>	Tree	
Basswood	<i>Tilia americana</i>	Tree	
Black Cherry	<i>Prunus serotina</i>	Tree	
Black Walnut	<i>Juglans nigra</i>	Tree	
Blackgum	<i>Nyssa slyvatica</i>	Tree	Poor sprouting from trees greater than 14 in DBH
Blackhaw	<i>Viburnum prunifolium</i>	Shrub	
Boxelder	<i>Acer negundo</i>	Tree	
Cottonwood, Eastern	<i>Populus deltoides</i>	Tree	
Dogwood, Red-Osier	<i>Cornus stolonifera</i>	Shrub	
Dogwood, Roughleaf	<i>Cornus drummondii</i>	Shrub	
Dogwood, Silky	<i>Cornus amomum</i>	Shrub	
Elm, Red	<i>Ulmus rubra</i>	Tree	
Hackberry	<i>Celtis occidentalis</i>	Tree	Poor sprouting from trees greater than 14 in DBH
Hickory, Bitternut	<i>Carya cordiformis</i>	Tree	
Hickory, Mockernut	<i>Carya tomentosa</i>	Tree	
Hickory, Pignut	<i>Carya glabra</i>	Tree	
Hickory, Shagbark	<i>Carya ovata</i>	Tree	
Hickory, Shellbark	<i>Carya laciniosa</i>	Tree	

Table 3 - Species capable of coppice regeneration (continued)

Common Name	Scientific Name	Growth Form	Note
Hornbeam, American	<i>Ostrya virginiana</i>	Tree	
Locust, Black	<i>Robina pseudoacacia</i>	Tree	
Locust, Honey	<i>Gleditsia triacanthos</i>	Tree	
Maple, Red	<i>Acer rubrum</i>	Tree	
Maple, Siver	<i>Acer saccharinum</i>	Tree	
Maple, Sugar	<i>Acer saccharum</i>	Tree	
Oak, Black	<i>Quercus velutina</i>	Tree	
Oak, Bur	<i>Quercus macrocarpa</i>	Tree	
Oak, Chinkapin	<i>Quercus muehlenbergii</i>	Tree	
Oak, Pin	<i>Quesrcus palustris</i>	Tree	
Oak, Red	<i>Quercus rubra</i>	Tree	
Oak, Scarlet	<i>Quercus coccinea</i>	Tree	
Oak, Swamp Chestnut	<i>Quecus michauxii</i>	Tree	
Oak, Swamp White	<i>Quercus bicolor</i>	Tree	Poor sprouting from trees greater than 14 in DBH
Oak, White	<i>Quercus alba</i>	Tree	Poor sprouting from trees greater than 14 in DBH
Pawpaw	<i>Asimina triloba</i>	Small Tree	
Persimmon	<i>Diospyros virginiana</i>	Tree	
Sassafras	<i>Sassafras albidum</i>	Tree	
Sweetgum	<i>Liquidambar styraciflua</i>	Tree	
Sycamore, American	<i>Plantanus occidentalis</i>	Tree	
Willow, Black	<i>Salix nigra</i>	Tree	
Yellow-Poplar	<i>Liriodendron tulipifera</i>	Tree	

Forest Regeneration Opening

The removal of woody vegetation will not occur from April 1 through July 30 to avoid the accidental taking of the endangered Indiana Bat (*Myotis sodalis*).

This component will be used to construct new regeneration openings or to maintain existing regeneration openings in forested areas to improve habitat for species that utilize and benefit from early successional forest stages.

The location, size and orientation of regeneration openings will be designed to achieve the desired purpose.

At the time of practice establishment:

1. Control all woody vegetation greater than 4 inches DBH (diameter breast height), and/or woody vegetation greater than 12 feet tall within the practice area.
2. Cut and treat all vines to prevent regrowth with appropriate methods.
3. Species greater than 10 inches in diameter (measured at 12 inches off the ground), and capable of coppice regeneration, will be cut at ground level, or no higher than 10 inches off the ground. See Table 1 for species capable of coppice regeneration.
4. Allow fruit bearing shrubs and small trees to grow.

Woody vegetation will be controlled by using one or more of the following methods:

1. Mechanical: Including hand cutting, shearing, hydro-axe, disking, and other approved techniques.
2. Chemical: Including broadcast, spot, cut-stem treatments, or basal spraying.

CONSIDERATIONS

General

Consider treatments whenever plant growth has gone past the desired successional stages.

Consider managing for early successional plant communities which are beneficial, if not essential, for less mobile animal species. The less mobile the species, the more important it is to provide all of the habitat requirements in a small area.

Consider the use of this practice to promote the conservation of declining species, including threatened and endangered species.

Consider requesting technical assistance from a NRCS biologist, Indiana Department of Natural Resources (IDNR) Division of Fish and Wildlife's District Biologist, or U.S. Fish and Wildlife Service (FWS) Biologist.

Grasslands

It is highly recommended that disturbance be delayed until after August 15, to reduce the chance of harming fledgling birds and other young wildlife.

Consider rotating early successional treatments throughout the managed area.

Consider the use of this standard to maintain brood-rearing habitat for bobwhite quail, ring-necked pheasant, and wild turkey.

Consider the use of this standard to maintain nesting habitat for grassland songbirds and other ground-nesting wildlife.

When establishing early successional habitat through natural succession, consider including a light seeding of a clover or an annual lespedeza to enhance the wildlife value.

Consider the use of Strip Disking, Strip Spraying, Prescribed Fire or Prescribed Grazing to increase the amount of open ground and encourage a diverse plant community of annuals and perennial plants where vegetation, such as in old pastures and abandoned areas, has become too thick for early successional grassland wildlife species to use.

Consider the type of farm machinery and the needed maintenance practices, such as firebreaks, for future access and maintenance. See NRCS FOTG Standard 394 - *Firebreak* for design criteria. Whenever possible, lay out strips to have some multiple or full width passes by all farm implements.

Consider planting disked or sprayed strips to an annual grain or grain mix. See NRCS FOTG Standard 645 - *Upland Wildlife Habitat Management* for food plot criteria.

Consider the potential negative impact of unintentionally establishing undesirable invasive species (such as wild parsnip, black mustard, quack grass, etc.) when applying early successional practices.

Consider using NRCS FOTG Standard 338 - *Prescribed Burning* to allow germination of seed bearing annuals, increase plant species diversity, control unwanted woody cover, and open up the stand for movement of small animals and birds.

Consider the potential negative effects of reduced plant diversity and reduced residual nesting cover for early successional grassland species that may result from annual mowing.

Consider mowing from the center of the field outward. This will allow wildlife the opportunity to seek cover in adjacent areas.

When mowing cool season grasses to control woody invasion, consider leaving more than 6 inches of standing vegetation to provide greater residual brood rearing and roosting habitat height.

Consider the timing of mowing to allow for residual plant growth prior to winter dormancy.

Woodlands

When using Woodland Edge Feathering adjacent to field edges, consider the use of NRCS FOTG 645 – *Upland Wildlife Habitat Development* to establish additional wildlife habitat in the adjacent field.

Consider using Woodland Edge Feathering to create dense, shrubby habitat for bobwhite quail, ruffed grouse and rabbits.

Consider using Woodland Edge Feathering around the perimeter of permanent forest openings and along the edges of permanent forest trails to minimize abrupt changes in habitat types and provide additional habitat for early successional wildlife species.

Consider the re-application of Woodland Edge Feathering when trees in the woodland edge become large enough to shade more than 60 percent of the area.

Consider the creation of regeneration openings to encourage the regeneration of shade intolerant tree species such as oaks, or to regenerate thick stem density of pioneering tree species that provide habitat for early successional forest wildlife species, such as Ruffed Grouse, Woodcock, Blue-winged Warblers, and Great-crested Flycatchers.

Consider developing regeneration openings on south facing slopes that are more prone to regenerate shade-intolerant tree species.

In the year prior to creating forest regeneration openings, consider conducting the cutting and treatment of vines.

Consider creating a number of small, scattered regeneration openings within the forested area, rather than a single large opening of comparable size, to benefit a variety of early successional wildlife other than game species.

When creating regeneration openings, consider that the recommended size of the openings may vary by species requirements, and that forest regeneration openings generally range from 0.5 acre to 5 acres, with openings of 1 to 3 acres being typical.

When conducting Woodland Edge Feathering or Regeneration Opening practices, consider that maximum re-growth of coppiced trees will be achieved when cut during the dormant season (October - March).

PLANS AND SPECIFICATIONS

Specifications for this practice will be prepared for each site. Specifications will be recorded using approved specification sheets, job sheets, and narrative statements in the conservation plan, or other acceptable documentation.

List the early successional species and life history stage for which the habitat is being managed.

OPERATION AND MAINTENANCE

A plan for operation and maintenance of early successional habitat at a minimum will include monitoring and management of vegetative measures. Actions will be carried out to ensure these practices function as intended throughout their expected lives. These actions include normal repetitive activities in the application and use of the practice (operation) such as prescribed fire, disking, or mowing, and repair and upkeep of the practice (maintenance) such as replacement of vegetative component as needed.

Spraying or other control of noxious plants will be done on a “spot” basis to protect forbs/legumes that benefit native pollinators and other wildlife.

When mowing to control invasive species and noxious weeds, “spot” mow only those portions of the field with problem weeds, leaving the remaining areas undisturbed.

Manage habitat elements in proper amounts and locations to benefit desired wildlife species.

The use of fertilizers, pesticides and other chemicals will not compromise the intended purpose of this standard.

REFERENCES

Conservation Mowing, Quail Unlimited, Inc., 1994 (20 minute video).

CRP Mid-Contract Management: Strip Disking, Strip Spraying, Inter-seeding and Prescribed Burning, NRCS Conservation Practice Job Sheets 647.

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