NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

EARLY SUCCESSIONAL HABITAT DEVELOPMENT/MANAGEMENT

(Ac.)

CODE 647

DEFINITION

Manage plant succession to develop and maintain early successional habitat to benefit desired wildlife and/or natural communities.

PURPOSE

To provide habitat for species requiring early successional habitat for all or part of their life cycle.

CONDITIONS WHERE PRACTICE APPLIES

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

CRITERIA

Use of this standard will comply with all applicable federal, state, and local laws and regulations.

Management will be designed to achieve the desired plant community structure (e.g., density, vertical and horizontal cover) and plant species diversity.

Seedbed preparation, species selection, seeding mixes, seeding rates, dates, depths, fertility requirements, site adaptation and planting methods will be consistent with the requirements in the IN NRCS Seeding Tool and/or Tables in Indiana (IN) Field Office Technical Guide (FOTG) Standard (645) Upland Wildlife Habitat Management.

Native plant species will be used whenever possible. Known invasive species will not be used.

Measures must be provided to control noxious weeds and invasive species.

If using chemical methods of control, refer to IN FOTG Standard (595) Integrated Pest Management.

Unless otherwise noted, management practices and activities will not disturb cover during the primary nesting period of April 1 through August 1.

Spraying or other control of weeds will be in a targeted manner through the use of spot spraying, mechanical or hand wick applicators, or other approved methods to protect grasses, forbs and legumes that benefit native pollinators and other wildlife.

Minimize soil disturbance in natural communities where soil integrity is essential, on steep slopes, on highly erodible soil, and where establishment of invasive species is likely.

A vegetated buffer will be left adjacent to all water bodies to maintain water quality.

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 Openings

Linear Woody Cover Renovation

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 1 for characteristics of early successional stages.

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 IN FOTG Standard (327) Conservation Cover for additional guidance.

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

Table 1 – Characteristics of Successional Stages

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

Strip Disking

Management practices and activities will not disturb cover during the primary nesting period for grassland birds of April 1 through August 1.

Frequency/Amount of Application

5 acres or more	⅓ of the area each of 3 years
Less than 5 acres	½ of the area each of 2 years, or total area in 1 year

Disking will result in 40% – 60% bare soil conditions (i.e. lacking duff and other debris) at the soil surface, with equal distribution throughout the area of disturbance. This will provide maximum plant and animal diversity.

Strips will be no wider than 50 feet.

Alternate the disked strips with undisturbed strips two (2) to four (4) times the width of the disked areas. Duplicate this pattern across the field.

Disked strips will be performed along field contours, or across the slope, when practical.

Strips will parallel brushy or woody escape cover when feasible.

Strip Spraying

Strips will be no wider than 50 feet.

Strips will parallel brushy or woody escape cover when feasible.

Frequency/Amount of Application

5 acres or more	⅓ of the area each of 3 years
Less than 5 acres	½ of the area each of 2 years, or total area in 1 year

Sprayed strips will be performed along field contours, or across the slope, when practical.

Strip Mowing

Strip Mowing will only be used to:

1. Control woody vegetation
2. Stress warm season grasses
3. Prepare for another early successional management technique

This practice can be used in conjunction with other early successional management techniques such as Strip Disking, Strip Spraying, or Prescribed Burning.

Management practices and activities will not disturb cover during the primary nesting period for grassland birds of April 1 through August 1.

Rotate fields through a 3-year mowing cycle.

Warm season grasses will be mowed shorter than six (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 IN FOTG Standard (645) Upland Wildlife Habitat Management for appropriate forb species.

If inter-seeding is used during the primary nesting period for grassland species (April 1 through August 1), no more than one-third (⅓) of the grassland acreage will be impacted during any one growing season.

Frequency/Amount of Application (outside of nesting period)

5 acres or more	⅓ of the area each of 3 years
Less than 5 acres	½ of the area each of 2 years, or total area in 1 year

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.

Inter-seeded fieldstrips will be a maximum of 50 feet wide. Alternate the strips with undisturbed strips two (2) to four (4) times the width of the inter-seeded areas. Duplicate this pattern across the field.

Inter-seeding operations will be performed along field contours, or across the slope, when practical.

Forb mixes will consist of a total of one-half (½) to one (1) lb. per acre, and will contain a minimum of five species in approximately equal proportions.

Inoculate legume seeds with proper inoculant.

Where erosion is a concern, such as in portions of filter strips, riparian buffers, grassed waterways, and contour buffers, no-till seeding will be used.

Areas planted to trees and/or shrubs will not be inter-seeded.

Strips will parallel brushy or woody escape cover when feasible.

Prescribed Burning

This practice can be used in conjunction with other early successional management techniques such as Strip Disking, Strip Spraying, or inter-seeding forbs/legumes.

If prescribed burning is used during the primary nesting period for grassland species (April 1 through August 1), no more than one-third (⅓) 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.

Prescribed burns will not be conducted from April 15 to September 15 in areas containing potential Indiana Bat (*Myotis sodalis*) roost trees/snags greater than three (3)-inches in Diameter Breast Height (DBH).

See IN FOTG Standard (338) Prescribed Burning for additional guidance.

Prescribed Grazing

If prescribed grazing is used during the primary nesting period for grassland species (April 1

through August 1), no more than one-third (⅓) of the grassland acreage will be impacted during any one growing season. See IN FOTG Standard (528) Prescribed Grazing for additional guidance.

When grazing is used as a management tool, a Prescribed Grazing plan developed to specifically meet the intent and objective(s) of this practice standard is required.

Woodland Edge Feathering

This practice will only be applied along the edge of woodlands, or the perimeter of permanent forest openings such as permanent fire trails, logging roads, etc. See **Linear Woody Cover Renovation** for woody habitat that is linear in shape.

The feathered edge will vary from 50 to 150 feet in width and will be created within, or immediately adjacent to, the woodland perimeter of a site.

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

Use the following techniques to achieve 75-90% canopy reduction in the first 50 feet, 50-74% canopy reduction in the next 50 feet, and 25%-49% in the remaining 50 feet:

1. Kill/control invasive and undesirable plants prior to canopy removal.
2. **Species capable of coppice regeneration** (see Table 2): cut trees/shrubs greater than 10 inches in diameter (measured at 12 inches off the ground), at 0 - 10 inches off the ground.
3. **Species <u>not</u> capable of coppice regeneration**: Control all woody vegetation greater than four (4) inches DBH (diameter breast height), and/or greater than 12 feet tall within the practice area.
4. Allow fruit-bearing shrubs and small trees to grow.
5. Treat stumps of undesirable trees with an appropriate herbicide to prevent re-sprouting.
6. As needed, cut and treat vines with herbicides that are labeled for this practice.

Trees or "tree tops" will be left where they fall or in a “windrow” along the edge of the treated area. Do not push the trees or "tree tops" into dense piles.

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.

When adding a feathered edge by planting immediately adjacent to existing woodland, three (3) zones will be created in the following order from the edge of the woodland:

1. Large shrubs and trees
2. Briars and shrubs
3. Native grasses and forbs

   Based on the target wildlife species, tree and shrub spacing will be 12 ft. x 12 ft. or closer – refer to IN FOTG Standard (645) Upland Wildlife Habitat Management.

If sod-forming grasses (such as tall fescue, smooth brome, etc.), or invasive species (such as Bush Honeysuckle, Japanese Honeysuckle, Autumn Olive, etc.) are present, treat with an approved contact herbicide prior to practice implementation.

Forest Regeneration Openings

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 use and benefit from early successional forest stages.

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

The location, size and orientation of regeneration openings will be designed to achieve the desired purpose. Request assistance from a professional Biologist as needed.

At the time of practice establishment:

1. Kill/control invasive and undesirable plants prior to canopy removal.
2. **Species capable of coppice regeneration** (see Table 2): cut

trees/shrubs greater than 10 inches in diameter (measured at 12 inches off the ground), at 0 - 10 inches off the ground.

3. **Species not capable of coppice regeneration**: Control all woody vegetation greater than four (4) inches DBH (diameter breast height), and/or greater than 12 feet tall within the practice area.
4. Allow fruit-bearing shrubs and small trees to grow.
5. Treat stumps of undesirable trees with an appropriate herbicide to prevent re-sprouting.
6. As needed, cut and treat vines with herbicides that are labeled for this practice.

Trees or "tree tops" will be left where they fall or in a “windrow” along the edge of the treated area. Do not push the trees or "tree tops" into dense piles.

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.

If sod-forming grasses (such as tall fescue, smooth brome, etc.), or invasive species (such as Bush Honeysuckle, Japanese Honeysuckle, Autumn Olive, etc.) are present, treat with an approved contact herbicide prior to practice implementation.

Linear Woody Cover Renovation

The purpose of this practice is to create dense woody escape cover for target species such as quail and rabbits. Apply to overgrown fencerows, draws, hedgerows and other similar linear woody habitats, where the majority of trees exceed 15 feet in height and have shaded out most of the forb and shrub understory. Apply Woodland Edge Feathering to woody habitat that is block-shaped (i.e. square or rectangular).

Trees or "tree tops" will be left where they fall or in a “windrow” along the edge of the treated area. Do not push the trees or "tree tops" into dense piles.

The width and length of the existing woody habitat will not be reduced through the application of this practice.

Apply this practice to no more than 150 linear feet per 300-foot length of treated woody habitat in any given year. The target size of individual treatment areas is one-fourth (0.25) acre.

Treat stumps of undesirable trees with an appropriate herbicide to prevent re-sprouting.

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

Cut all trees over 15 feet tall in the treatment area using one or more of the following methods:

1. Mechanical: Including hand cutting, shearing, tree saw, and other approved techniques. The use of a bulldozer or hydro-axe, are not acceptable techniques for this practice.
2. Chemical: Including broadcast, spot, cut-stem treatments, or basal spraying.

Leave one potential bat roosting/maternity tree undisturbed for each 50-feet of treated area. See Indiana Bat Forest Management Guidelines in Section II of the Indiana FOTG for additional information.

If sod-forming grasses, invasive, or undesirable species are present (such as tall fescue, smooth brome, wild parsnip, black mustard, quack grass, etc.), treat with an approved contact herbicide before cutting trees.

Native shrubs will not be cut or sprayed. See IN FOTG Standard (645) Upland Wildlife Habitat Management for examples of native shrubs.

Trees will be left where they fall or in a “windrow” along the edge of the treated area. Do not push the trees into dense piles.

Treat stumps of undesirable trees with an appropriate herbicide to prevent re-sprouting.

Livestock will be excluded from treated areas.

Table 2 - Species capable of coppice regeneration

Common Name	Scientific Name	Growth Form	Note
Ash, Green	Fraxinus pennsylvanica	Tree	
Ash, White	Fraxinus americana	Tree	
Basswood	Tilia americana	Tree	
Black Cherry	Prunus serotina	Tree	
Black Walnut	Juglans nigra	Tree	
Blackgum[1]	Nyssa slyvatica	Tree	Poor sprouting from trees greater than 14 in DBH
Blackhaw	Viburnum prunifolium	Shrub	
Boxelder	Acer negundo	Tree	
Cottonwood, Eastern	Populus deltoides	Tree	
Dogwood, Red-Osier	Cornus stolonifera	Shrub	
Dogwood, Roughleaf	Cornus drummondi	Shrub	
Dogwood, Silky	Cornus amomum	Shrub	
Elm, Red	Ulmus rubra	Tree	
Hackberry[1]	Celtis occidentalis	Tree	Poor sprouting from trees greater than 14 in DBH
Hickory, Bitternut	Carya cordiformis	Tree	
Hickory, Mockernut	Carya tomentosa	Tree	
Hickory, Pignut	Carya glabra	Tree	
Hickory, Shagbark	Carya ovata	Tree	
Hickory, Shellbark	Carya laciniosa	Tree	
Hornbean, American	Ostrya virginiana	Tree	
Locust, Black	Robina pseudoacacia	Tree	
Locust, Honey	Gleditsia triacanthos	Tree	
Maple, Red	Acer rubrum	Tree	
Maple, Siver	Acer saccharinum	Tree	
Maple, Sugar	Acer saccharum	Tree	
Oak, Black	Quercus velutina	Tree	
Oak, Bur	Quercus macrocarpa	Tree	
Oak, Chinkapin	Quercus muehlenbergii	Tree	
Oak, Pin	Quesrcus palustris	Tree	
Oak, Red	Quercus rubra	Tree	
Oak, Scarlet	Quercus coccinea	Tree	
Oak, Swamp Chestnut	Quecus michauxii	Tree	
Oak, Swamp White[1]	Quercus bicolor	Tree	Poor sprouting from trees greater than 14 in DBH
Oak, White[1]	Quercus alba	Tree	Poor sprouting from trees greater than 14 in DBH
Pawpaw	Asimina triloba	Small Tree	
Persimmon	Diospyros virginiana	Tree	
Sassafras	Sassafras albidum	Tree	
Sweetgum	Liquidambar styraciflua	Tree	
Sycamore, American	Plantanus occidentalis	Tree	
Willow, Black	Salix nigra	Tree	
Yellow-Poplar	Liriodendron tulipifera	Tree	

CONSIDERATIONS

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 requesting technical assistance from a professional Biologist.

Grasslands

Consider the use of this standard where areas, such as in old pastures and abandoned areas, have become too thick for early successional grassland wildlife species to use.

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

When establishing early successional habitat through natural succession, consider including a light seeding of a clover or other legume to enhance the wildlife value and to benefit native pollinators.

Consider the type and width of farm machinery, and future access and maintenance needs, when designing firebreaks. See IN FOTG Standard (394) Firebreak for design criteria.

Where food is a limiting factor, consider planting disked or sprayed strips to an annual grain or grain mix. See IN FOTG Standard (645) Upland Wildlife Habitat Management for food plot criteria.

Consider using Prescribed Burning to control unwanted woody cover in lieu of annual mowing.

Consider leaving more than six (6) inches of standing vegetation when mowing to provide greater residual brood rearing and roosting habitat height.

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

Consider mowing early enough in the fall to allow for plant re-growth of at least eight (8) inches prior to winter dormancy.

When prescribed grazing, consider setting aside a paddock near the center of the pasture and defer grazing until after the critical nest and brood rearing period. Many grassland birds require more than 40 days to fledge their young.

Woodlands

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.

When using Woodland Edge Feathering adjacent to field edges, consider establishing additional wildlife habitat in the adjacent field.

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 staggering the application of Woodland Edge Feathering to portions of woodland edges over a period of years to reduce the amount of area needed to treated, or re-treated, in any given year.

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.

When creating regeneration openings, the recommended size and number of the openings will vary by species requirements. Forest regeneration openings generally range from one-half (½) acre to five (5) acres, with openings of one (1) to three (3) acres being typical. However, openings of ten acres or more may be optimal for some species.

Where Linear Woody Cover Renovation is performed and shrubs do not exist in the understory, consider leaving some stumps untreated.

Where deer are a problem, consider placing the tops of cut trees over stump re-sprouts and shrub-releases as barriers to deer browse.

Where Linear Woody Cover Renovation is performed, consider:

Girdle some overstory trees and leave standing for potential Indiana Bat roosting/ maternity habitat.

Applying each year until the entire linear woody habitat has been treated.

Cutting and using logs greater than 10 inches in diameter for firewood.

When selecting plants and designing management for this practice, consider the needs of pollinators and incorporate to the maximum extent practicable. For further information see Illinois Biology Technical Note No. 23 Pollinator Biology and Habitat.

When thinning overstory trees in and along woodland edges, consider avoiding areas with valuable crop trees.

Consult a professional forester before implementing this practice when the primary goal of the woodland is forest production or high value timber products.

Consider implementing this practice in conjunction with future planned timber harvests and/or Forest Stand Improvement (FSI) practices.

PLANS AND SPECIFICATIONS

Plans and specifications will be prepared for the practice site. Plans will include the following as appropriate:

- Plan view
- Species of plants to be established.
- Seeding rates.
- Seeding dates.
- Establishment procedure.
- Planned rates and timing of nutrient application.
- Other information pertinent to establishing and managing the species or species of plants to be established.
- If grazed, use a prescribed grazing plan according to IN FOTG Standard (528) Prescribed Grazing.

Plans and specifications for the establishment and management of the species or species of plants to be established may be recorded in narrative form, on job sheets, or on other forms.

OPERATION AND MAINTENANCE

Any plant species, whose presence or overpopulation may jeopardize this practice, will be controlled. Spraying or other control methods will be performed on a “spot” basis to protect forbs/legumes that benefit native pollinators and other wildlife.

An operation and maintenance plan will be provided to and reviewed with the landowner. The plan will include the following items and others as appropriate.

Promptly repair eroded areas.

Reestablish vegetative cover immediately where scour erosion has removed established seeding.

Periodically inspect the area for any new maintenance items and take immediate action to protect from further damage or deterioration.

Management will be designed to achieve the desired plant community in density, vertical and horizontal structure and plant species diversity.

Renovated woody linear habitats can be expected to last five (5) to 10 years. Enhance these areas by periodically re-cutting woody sprouts or cut new areas along the woody corridor.

Herbaceous plantings that are a component of woodland edge feathering will need periodic disturbance. See management practices under **Grassland Habitat**.

REFERENCES

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USDA Natural Resources Conservation Service, NRCS Conservation Practice Job Sheets (647), *CRP Mid-Contract Management: Strip Disking, Strip Spraying, Inter-seeding* and *Prescribed Burning.*