

## NATURAL RESOURCES CONSERVATION SERVICE

### CONSERVATION PRACTICE STANDARD

#### Upland Wildlife Habitat Management

(Acre)

Code 645

#### DEFINITION

Provide and manage upland habitats and connectivity within the landscape for wildlife.

#### PURPOSES

Treating upland wildlife habitat concerns identified during the conservation planning process that enable movement, or provide shelter, cover, and food in proper amounts, locations and times to sustain wild animals that inhabit uplands during a portion of their life cycle.

#### CONDITIONS WHERE PRACTICE APPLIES

Land where the decision maker has identified an objective for conserving a wildlife species or ecosystem.

Land within the range of targeted wildlife species and capable of supporting the desired habitat.

#### CRITERIA

##### **General Criteria Applicable to All Purposes**

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

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

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

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

Habitat development and management will achieve sustainable populations for the target species and meet the objectives of the land user.

When managing for early successional species such as Bob White Quail, Pheasant, Eastern Cottontail Rabbit, and grassland songbirds, regular, periodic disturbance of the habitat is required. See Indiana (IN) Field Office Technical Guide (FOTG) Standard (647) [Early Successional Habitat Development and Management](#) for further guidance.

Utilize other IN FOTG Standards as necessary to create a wildlife management plan.

When water is a limiting factor for the target species, an adequate water supply will be provided. The water supply will come from either existing water sources or be developed using appropriate NRCS standards.

Harvesting or grazing by domestic livestock will not be permitted, unless specified in an approved grazing plan.

**Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service State Office, or download it from the Field Office Technical Guide for your State.**

### **Wildlife Food Plots**

Select species, rates and layout for food plots using IN FOTG Standard (645) Upland Wildlife Habitat Management - [Wildlife Food Plot Job Sheet](#).

Food Plots will be left standing throughout the winter and spring until replanted. Planting will occur early enough to allow the selected species to mature before frost.

Annual food plots will be rotated each year. Plant only  $\frac{1}{3}$  of the food plot each year. Allow the natural succession of forbs to occur on the remaining  $\frac{2}{3}$  of the food plot.

When food plots are relocated or discontinued, the site will be re-seeded to surrounding cover, based on this standard.

### **Additional criteria to provide a variety of cover types for the target wildlife species**

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 1 – 5. Commonly used, suitable species can also be found in the IN Biology Technical Note - Upland Wildlife Habitat.

Native Grass mixes will consist of at least:

- Two (2) native grass species, plus
- One (1) legume species, plus
- A minimum of  $\frac{1}{2}$  pound of native forbs, consisting of at least five (5) species in approximately equal proportions by weight. Additional amounts of one or more large-seeded forbs may be added not to exceed an additional  $\frac{1}{2}$  pound.

See [Table 1](#) for examples of native grass mixes.

Introduced grass mixes will consist of at least:

- Two (2) introduced grass species
- Two (2) legume species

Native forbs can be added to the mix to provide additional plant diversity, or to meet the needs of the target species.

See [Table 2](#) for examples of introduced grass mixes.

### **Trees and Shrubs**

Tree and shrub planting density will be based on requirements of the target wildlife species.

Where no target species is identified, select the appropriate habitat type from [Table 3](#) to determine the planting density.

Tree and/or shrub plantings will follow IN FOTG Standard (612) [Tree/Shrub Establishment](#) for site preparation, planting dates, planting and storage guidelines.

Trees and shrubs will be planted in blocks, clumps or strips with spacing designed to meet the habitat requirements of the desired wildlife species. Clumps and strips will have an irregular shape. Strips will be planted based upon field configuration and wildlife habitat needs.

Tree and shrub plantings designed for wildlife corridors will be based on wildlife species requirements. Corridors will be a minimum width of 50 feet.

Wildlife corridors will be composed of one of the following:

- At least three (3) rows of shrubs, one (1) row of a soft mast tree species, and one (1) row of a hard mast tree species.
- A shrubs-only corridor consisting of a minimum of five (5) rows of shrubs when shrubland is a limiting habitat factor for the target species. The tallest species will be placed in the center rows.
- A corridor consisting of at least one (1) row of pines, one (1) row of hard mast tree species, and two (2) rows of shrubs when thermal cover is a limiting habitat factor.

### **Pollinators**

Pollinator habitat areas will be at least  $\frac{1}{2}$  acre in size and consist of a sufficient number of plant species (flowering trees, shrubs, forbs, legumes, and vines) to sustain the target pollinators throughout the growing season. Example pollinator mixes can be found in [Table 4](#) and [Table 5](#) of this standard. For further information see Illinois Biology Technical Note No. 23 [Pollinator Biology and Habitat](#), September 2008 and the Pollinator Partnership's [Selecting Plants for Pollinators](#).

Insecticides will not be used in areas designated as pollinator habitat.

Management or maintenance activities will be conducted outside of the growing season or period of bloom.

Any use of the pollinator habitat area will not compromise its intended purpose.

**Table 1 – Example Native Grass/Legume Mixes**

Target Wildlife Species/Habitat	Grass Species	Rate (PLS) lbs.	Native Forbs	Rate (PLS) ozs.
<b>Northern Bobwhite Quail</b>	Big Bluestem ( <i>Andropogon gerardii</i> )	0.25	<b>Base Legume and Forb Mix + 1 or more of the following:</b> Showy Tick Trefoil ( <i>Desmodium canadense</i> ) Butterfly Milkweed ( <i>Asclepias tuberosa</i> ) Lead Plant ( <i>Amorpha canescens</i> ) Round-headed Lespedeza ( <i>Lespedeza capitata</i> )	1 2 2 2
	Little Bluestem ( <i>Schizachyrium scoparium</i> )	2.00		
	Sideoats gramma ( <i>Bouteloua curtipendula</i> )	1.25		
	Canada Wildrye ( <i>Elymus canadensis</i> )	0.50		
<b>Ring-Necked Pheasant</b>	Big Bluestem ( <i>Andropogon gerardii</i> )	1.00	<b>Base Legume and Forb Mix + 1 or more of the following:</b> New England Aster ( <i>Aster novaeangliae</i> ) Rigid Goldenrod ( <i>Solidago rigida</i> ) Cream White Indigo ( <i>Baptisia lactea</i> ) Nodding Bur Marigold ( <i>Bidens cernua</i> )	1 1 2 2
	Little Bluestem ( <i>Schizachyrium scoparium</i> ) <sup>1</sup>	2.00		
	Indiangrass ( <i>Sorghastrum nutans</i> )	0.50		
	Switchgrass ( <i>Panicum virgatum</i> )	0.25		
<b>Song Birds</b>	Big Bluestem ( <i>Andropogon gerardii</i> )	0.50	<b>Base Legume and Forb Mix + 1 or more of the following:</b> Prairie Dock ( <i>Silphium terebinthinaceum</i> ) or, Cup Plant ( <i>Silphium perfoliatum</i> ) Rattlesnake Master ( <i>Eryngium yuccifolium</i> ) Dense Blazing Star ( <i>Liatris spicata</i> ) Foxglove Beardtongue ( <i>Penstemon digitalis</i> )	4 2 2 1
	Little Bluestem ( <i>Schizachyrium scoparium</i> )	1.50		
	Indiangrass ( <i>Sorghastrum nutans</i> )	0.25		
	Switchgrass ( <i>Panicum virgatum</i> )	0.25		
	Canada Wildrye ( <i>Elymus canadensis</i> )	1.00		
<b>Poorly Drained (Non Flood Plain)</b>	Big Bluestem ( <i>Andropogon gerardii</i> )	1.25	<b>Base Legume and Forb Mix + 1 or more of the following:</b> Prairie Dock ( <i>Silphium terebinthinaceum</i> ) or, Cup Plant ( <i>Silphium perfoliatum</i> ) Swamp Milkweed ( <i>Asclepias incarnata</i> ) Dense Blazing Star ( <i>Liatris spicata</i> ) Foxglove Beardtongue ( <i>Penstemon digitalis</i> )	4 1 2 1
	Indiangrass ( <i>Sorghastrum nutans</i> )	0.75		
	Switchgrass ( <i>Panicum virgatum</i> )	0.25		
	Riverbank Wildrye ( <i>Elymus riparius</i> ) or, Virginia Wildrye ( <i>Elymus virginicus</i> )	2.25 1.25		
<b>Base Legume and Forb Mix: MWD - ED Soil Moisture Tolerance</b>			Partridge Pea ( <i>Cassia fasciculata</i> ) Illinois Bundleflower ( <i>Desmanthus illinoensis</i> ) Purple Prairie Clover ( <i>Petalostemum purpureum</i> ) Purple Coneflower ( <i>Echinacea purpurea</i> ) Black-eyed Susan ( <i>Rudbeckia hirta</i> ) Wild Bergamont ( <i>Monarda fistulosa</i> )	4 1 3 2 1 1
<b>Base Legume and Forb Mix: PD – SWP Soil Moisture Tolerance</b>			Showy Tick Trefoil ( <i>Desmodium canadense</i> ) Cream White Indigo ( <i>Baptisia lactea</i> ) Wild Senna ( <i>Cassia hebecarpa</i> ) Marsh Blazing Star ( <i>Liatris spicata</i> ) New England Aster ( <i>Aster novaeangliae</i> ) Nodding Bur Marigold ( <i>Bidens cernua</i> ) Sneezeweed ( <i>Helenium autumnale</i> )	3 2 3 1 2 2 2

<sup>1</sup> Substitute Virginia Wildrye (*Elymus virginicus*) on muck soils.

Table 2 – Example Introduced Grass/legume Mixes

Target Wildlife Species/Habitat	Grass Species	Rate Lbs. (PLS)	Legumes	Rate Lbs. (PLS)
Northern Bobwhite Quail	Redtop ( <i>Agrostis gigantea</i> )	0.75	Birdsfoot Trefoil ( <i>Lotus corniculatus</i> )	0.50
	Riverbank Wildrye ( <i>Elymus riparius</i> ) or,	2.00	White Dutch Clover ( <i>Trifolium repens</i> )	0.25
	Virginia Wildrye ( <i>Elymus virginicus</i> )	1.75		
Song Bird	Timothy ( <i>Phleum pratense</i> )	0.50	Ladino Clover ( <i>Trifolium repens</i> )	0.25
	Orchardgrass ( <i>Dactylis glomerata</i> )	2.00	Alfalfa ( <i>Medicago sativa</i> )	0.75
Ring-necked Pheasant (erosive rate)	Timothy ( <i>Phleum pratense</i> )	4.50	Ladino Clover ( <i>Trifolium repens</i> )	1.00
	Orchardgrass ( <i>Dactylis glomerata</i> )	1.00	Alfalfa ( <i>Medicago sativa</i> )	1.00
Rabbit	Kentucky Bluegrass ( <i>Poa pratensis</i> )	1.75	Birdsfoot Trefoil ( <i>Lotus corniculatus</i> )	0.50
	Redtop ( <i>Agrostis gigantea</i> )	1.00	Ladino Clover ( <i>Trifolium repens</i> )	0.25
Poorly Drained - Non flood plain	Timothy ( <i>Phleum pratense</i> ) or,	1.00	Alsike Clover ( <i>Trifolium hybridum</i> )	0.25
	Redtop ( <i>Agrostis gigantea</i> )	0.75		
	Riverbank Wildrye ( <i>Elymus riparius</i> ) or,	2.50	White Dutch Clover ( <i>Trifolium repens</i> )	0.25
	Virginia Wildrye ( <i>Elymus virginicus</i> )	1.25		

Table 3 – Tree Planting Densities

Woodland Habitat Type <sup>1</sup>	Stems/Acre	Spacing	Species Benefited	Comments
General Wildlife	300	12 ft. x 12 ft.	Wooded-wildlife generalists (including deer, raccoons, squirrels, and songbirds).	
	436	10 ft. x 10 ft.		
Early successional	300 (shrubs only)	12 ft. x 12 ft.	Willow flycatcher, Prairie warbler, Yellow breasted chat, and Yellow warbler.	Intended to maximize the length of early successional habitat development stage.
	Min. 640	Min. 8 ft. x 8 ft.	Woodcock, Ruffed Grouse, and various woodland/early successional forest songbirds.	Where cropland, located within forested settings, is planted to trees to “fill in the gaps” for forest interior birds. Intended to maximize woody stem density in a short period of time. No follow-up herbicide treatment will be used after planting.
Edge feathering	300	12 ft. x 12 ft.	Rabbits, quail, turkey and songbirds.	Where soft mast-producing trees and shrubs are planted adjacent to existing woodland, as opposed to cutting back into the woodland edge to achieve the same results. See <a href="#">Feathering Wooded Edges Job Sheet</a> .
Closed-canopy	544	8 ft. x 10 ft.	Neotropical migratory songbirds; Copperbelly Water Snake.	Intended to have closed-canopy woody vegetation within a 10 to 20-year period.
Savanna	50*	30 ft. x 30 ft.*	Bluebirds, Short-eared owls, Red-headed Woodpeckers, swallows, orioles, and grassland birds, bats, and butterflies.	*See IN FOTG Standard (643) <a href="#">Restoration and Management of Declining Habitats</a> for further guidance.
Natural Regeneration	N/A	N/A	Turkey, Ruffed Grouse and an array of other species as succession progresses.	

<sup>1</sup> Sites with minimal or no flooding limitations

**Table 4 – Example Pollinator Forb/Legume Mix**

Forbs and Legumes <sup>2</sup>	Soil Moisture Tolerance	Flowering Period	Seed Rate PLS (oz./acre)	Remarks
Beardtongue, Foxglove ( <i>Penstemon digitalis</i> )	PD - WD	May-July	1.0	White/pink flower
Coneflower, Purple ( <i>Echinacea purpurea</i> )	MWD - ED	June-August	4.0	Purple flower
Milkweed, Butterfly (a.k.a. Butterfly Weed) ( <i>Asclepias tuberosa</i> )	MWD – ED	June-September	1.0	Orange flower
Prairie Clover, White ( <i>Dalea candida</i> )	MWD - ED	June-November	1.0	White flower Legume
Bundle Flower, Illinois ( <i>Desmanthus illinoensis</i> )	MWD - ED	July-August	2.0	White flower Legume
Prairie Clover, Purple ( <i>Dalea purpureum</i> )	MWD - ED	July-August	2.0	Purple flower Legume
Blazing Star, Marsh (a.k.a. Gayfeather) ( <i>Liatris spicata</i> )	VPD - WD	July-September	1.0	Lavender flower
Lespedeza, Roundhead ( <i>Lespedeza capitata</i> )	MWD – ED	July-September	1.0	Green flower Legume
Wild Bergamot or Bee balm ( <i>Monarda fistulosa</i> )	SPD – WD	July-September	1.0	Lavender flower
Aster, New England ( <i>Aster novae-angliae</i> )	PD – WD	July-November	1.0	Violet flower
Goldenrod, Rigid or Stiff ( <i>Solidago rigida</i> )	SPD - ED	Sept-November	1.0	Yellow flower
<b>TOTAL</b>			<b>16.0</b>	

<sup>2</sup> Substitute forb and legume species (from within this standard) with matching flowering periods are acceptable.

**Table 5 – Example Pollinator Shrub Mix<sup>3</sup>**

Shrubs <sup>4</sup>	Soil Moisture Tolerance	Ave. Mature Height (ft.)	Flowering Period	Remarks	
Serviceberry ( <i>Amelanchier arborea</i> )	MWD - WD	30	March - April	White flowers with purplish fruits.	
Spicebush ( <i>Lindera benzoin</i> )	VPD – WD	9	March - May	Yellow/green flowers with small red fruit.	
Redbud ( <i>Cercis Canadensis</i> )	MWD – WD	30	April - May	Reddish-purple flowers. Legume.	
Pick one	Arrowwood ( <i>Viburnum dentatum</i> )	MWD - WD	9	April - July	White flowers
	Blackhaw ( <i>Viburnum prunifolium</i> )	MWD - WD	20		
	Highbush Cranberry ( <i>Viburnum trilobum</i> )	VPD – WD	9		
	Nannyberry ( <i>Viburnum lentago</i> )	SPD – WD	18		
Chokeberry, Black ( <i>Aronia melanocarpa</i> )	SPD – WD	10	May – June	White flowers with dark-purple fruit.	
Elderberry ( <i>Sambucus Canadensis</i> )	VPD – WD	9	May - July	White flowers with Purple-black fruit.	
Pick one	Dogwood, Alternate Leaf ( <i>Cornus alternifolia</i> )	SPD – WD	18	May - July	White flowers with blue-black fruit.
	Dogwood, Flowering ( <i>Cornus florida</i> )	MWD - WD	30		White flowers with glossy red fruit.
	Dogwood, Gray ( <i>Cornus racemosa</i> )	SPD – WD	8		White flowers with white fruit
	Dogwood, Red Osier ( <i>Cornus stolonifera</i> )	VPD – WD	10		White flowers with white fruit
	Dogwood, Rough Leaved ( <i>Cornus drummondii</i> )	PD – WD	18		White flowers with white fruit
	Dogwood, Silky ( <i>Cornus amomum</i> )	VPD – WD	10		White flowers with Bluish fruit
Sumacs ( <i>Rhus spp.</i> )	MWD – ED	8 - 15	May - September	Yellow-green flowers with reddish fruit.	

<sup>3</sup> 8 ft. x 8 ft. spacing (681 shrubs/acre).

<sup>4</sup> Substitute shrub species (from within this standard) with matching flowering periods are acceptable.

## CONSIDERATIONS

### General

Consider irregular edges on plantings and transition areas which provide greater habitat quality in lieu of straight or square plantings.

Wildlife population control, such as deer hunting, is a responsibility of the landowner and may be necessary to protect and maintain certain habitats.

Consider developing wildlife management plans with assistance from an NRCS Biologist, IDNR District Wildlife Biologist, or FWS Biologist when a plan is large (5 acres or larger) or complex. Planners should seek assistance for plans addressing the needs of multiple wildlife species.

### Food

In general, consider developing one (1) food plot for every 40 acres of land as a minimum, not to exceed 5% of total planned acreage. Consider making food plots at least 50 feet wide, and a minimum of ¼ acre. However, in high deer density areas, food plots should be planted in squares (to reduce the proportion of edge) with a plot size of two (2) to five (5) acres.

Consider locating food plots in the least erosive areas of the field, and dispersing evenly.

The control of common annual weeds such as foxtail, common ragweed, and smartweeds in food plots is not required. The presence of many native forbs actually benefit wildlife by providing higher protein and greater number of seeds than domestic grains.

Consider leaving grain crop strips along field edges, adjacent to other cover types.

Consider inter-seeding legumes into existing cool season grass stands to provide a needed food source and add plant diversity to attract greater insect populations. See IN FOTG Standard (647) [Early Successional Habitat Development/Management](#) for additional guidance.

### Cover

Consider using natural regeneration along woodland edges if the sites have an acceptable seed source from adjacent areas. Natural regeneration of light seeded species (e.g. green ash, silver maple, and cottonwood) is likely to establish large numbers of tree seedlings. Consider planting hard-mast trees, such as oaks and hickories, when acceptable seed source is limiting.

Consider emphasizing placement of tree and shrub plantings which connect isolated wooded sites to reduce habitat fragmentation.

Consider using local genotype herbaceous plant material within a 200-mile radius of the planting site.

Consider creating brush piles for wildlife cover with materials left from timber stand improvement or opening development. Brush piles should be distributed adjacent to clearings, roads, and along the outer edges of the site. See 645 - Upland Wildlife Habitat Management - [Wildlife Brush Pile Job Sheet](#) for more details.

### Pollinators

If pesticides are used in fields adjoining pollinator habitat, consider applying them in the evening when most insect pollinators are not active.

## PLANS AND SPECIFICATIONS

Plans and specifications will be prepared for the practice site. Plans include, but are not limited to:

- Plan view
- Primary species of concern, as determined by land user.
- Habitat limitations and how limitations will be addressed.
- Species of plants to be established.
- Seeding rates for all habitat elements.
- Recommended seeding dates.
- Establishment procedure.
- Watering information based on species.
- Food plot maintenance plan, if needed.
- Other information pertinent to establishing and managing the species or species of plants to be established.

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

## OPERATION AND MAINTENANCE

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

A plan for operation and maintenance of upland wildlife habitat at a minimum will include monitoring and management of structural and vegetative measures. Actions will be carried out to ensure these practices function as intended throughout the expected lifespan. These actions include normal repetitive activities such as prescribed fire or disking and repair and upkeep of the vegetative components as needed.

Any plant species, whose presence or overpopulation may jeopardize this practice, will be controlled. Spraying or other control methods will be done 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.

1. Promptly repair eroded areas.
2. Reestablish vegetative cover immediately where scour erosion has removed established seeding.
3. If grazed, use a prescribed grazing plan according to NRCS FOTG Standard (528) [Prescribed Grazing](#).
4. Periodically inspect area for any new maintenance items and take immediate action to protect from further damage or deterioration.

Apply supplemental nutrients only as needed to maintain the desired species composition and stand density. Fertilizer is not recommended for native grass/forb or tree and shrub plantings.

When mowing is necessary, restrict mowing to August 1 through August 20 to allow re-growth for winter cover. Mow cool season grasses no shorter than six (6) inches and native warm season grasses no shorter than 10 inches.

Use IN FOTG Standard (647) [Early Successional Habitat Development/Management](#), to maintain early successional habitat.

## REFERENCES

- IDNR Division of Fish & Wildlife. *Species Information*.  
<http://www.in.gov/dnr/fishwild/3357.htm>
- IDNR Division of Fish & Wildlife. *Managing Deer Damage*.  
<http://www.in.gov/dnr/fishwild/2718.htm>
- IDNR Division of Fish & Wildlife. *Wildlife Habitat Fact Sheets*  
<http://www.in.gov/dnr/fishwild/3025.htm>
- Illinois Department of Conservation, Division of Natural Heritage. 1993. *Habitat Establishment, Enhancement and Management of Forest and Grassland Birds in Illinois*.
- United States Department of Agriculture, Natural Resources Conservation Service. *National Biology Manual*. Title 190, Washington, DC.
- United States Department of Agriculture, Natural Resources Conservation Service. 2004. *National Biology Handbook*. Washington, DC.
- United States Department of Agriculture, Natural Resources Conservation Service. *Indiana Biology Home Page*  
[www.in.nrcs.usda.gov/technical/biology/biology.html](http://www.in.nrcs.usda.gov/technical/biology/biology.html)
- United States Department of Agriculture, Natural Resources Conservation Service, *Ecological Sciences Tools and Documents - Technical Notes*  
<http://www.nrcs.usda.gov/technical/ECS/database/technotes.html>