

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD
RESTORATION AND MANAGEMENT OF RARE OR DECLINING
HABITATS

(Acre)

CODE 643

DEFINITION

Restoring, conserving, and managing unique or diminishing native terrestrial and aquatic ecosystems.

PURPOSES

To return aquatic or terrestrial ecosystems to their original or usable and functioning condition and to improve biodiversity by providing and maintaining habitat for fish and wildlife species associated with the ecosystem.

CONDITIONS WHERE PRACTICE APPLIES

Sites or areas that once supported or currently support a unique, dwindling, or imperiled native plant and animal community.

This standard applies to the establishment/restoration of following habitat types:

- I. Tall Grass Prairie Establishment
- II. Low Stature Prairie Establishment
- III. Sedge Meadow Establishment
- IV. Fen Restoration
- V. Savanna Establishment
- VI. Open Oak Woodland
- VII. Restoration of Existing Degraded Habitats

This standard applies to *prairie and savanna* establishment if one of the following conditions exist:

- The soil is a Mollisol, or Mollic Intergrade **or**

- The site is a remnant prairie or savanna, **or**
- The site can be documented as prairie or savanna from historical records.

This standard applies to *Sedge Meadow* enhancement or restoration where sites are dominated by hydric soils (i.e. greater than 50% hydric). Sedge meadows are plant communities that are dominated by sedge species (*Carex spp.*).

This standard applies to *Fen* wetland types that are degraded or that can be enhanced. Fens are wetlands that are dominated by muck and/or marl that are calcareous under natural conditions. Hydrology is alkaline from natural groundwater seepage and dominant plant species are calciphiles (plants adapted to alkaline conditions) under natural conditions.

This standard applies to *Open Oak Woodland* if the site is a non floodplain soil series that is Moderately to Excessively drained with ≤ 6 inches of available water capacity (in the upper 150 cm or about 60 inches). Open oak woodland sites contain oak tree species with canopy coverage ranging from 50-70% canopy. They also have a diverse herbaceous understory with native grasses and forbs.

CRITERIA

General Criteria Applicable to All Purposes

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

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 electronic Field Office Technical Guide for your state.

Plant Materials Selection

Only seed that is source identified by the Indiana Crop Improvement Association through the Yellow Tag certification program or equivalent will be used.

Site preparation and planting of the plant materials will ensure an acceptable survival rate. Seeding and planting rates will be adequate to accomplish the planned purpose. Species planted will be suitable for the planned purpose, soils, climate and site conditions. Only high quality and ecologically adapted plant materials will be used.

Fertilizer will not be used for this practice (this includes nitrogen) as it only encourages competing weed growth.

Refer to IN FOTG Forestry Technical Note: Tree & Shrub Establishment for applicable criteria for tree and shrub plantings.

Newly planted trees must be protected from fire during establishment. Trees will be protected from fire for a minimum of 5 years after planting or until they have a minimum diameter of 3 inches at breast height.

Seeding Dates

Native Plants will be seeded from April 1 – June 15 or using a Dormant seeding December 1 - April 1

Vegetative Manipulations

Vegetative manipulations to restore plant and/or animal diversity will be accomplished by prescribed burning or by mechanical, biological or chemical methods, or a combination of the above. See Indiana (IN) Field Office Technical Guide (FOTG) Standard (314) Brush Management, (315) Herbaceous Weed Control, and (647) Early Successional Habitat Development/ Management for additional guidance.

Haying and/or grazing plans will be developed if used to achieve or maintain the intended purpose.

Chemical methods, prescribed burning or mowing may be utilized at any time during the establishment period as needed.

After establishment, management practices and activities will not disturb cover during the primary nesting period of April 1 through August 15.

Many herbicides may damage wildflowers used with this practice. Check the herbicide label and a local expert before spraying herbicides.

Additional Criteria to Provide Habitat for Rare and Declining Species

I. Tall Grass Prairie Establishment

The seeding mixture will consist of one (1) of the following prairie grass mixes, plus 10 additional species including at least:

- a) Five (5) species from the *Composite List*
- b) Two (2) species from the *Other Species List* and
- c) One (1) species from the *Legume List*

Native Prairie Grass List

Select one of the following prairie grass mixes.

Mix 1 - Mesic/ Dry Prairies consisting of moderately well drained (MWD), well drained (WD), and excessively drained (ED) soils:

Mix 1 Species	lbs./ac. of PLS ¹
Big Bluestem <i>Andropogon gerardii</i>	1.0
Indiangrass <i>Sorghastrum nutans</i>	1.0
Little Bluestem <i>Schizachyrium scoparium</i>	1.0
Sideoats Grama <i>Bouteloua curtipendula</i> <u>or</u> Canada Wildrye <i>Elymus canadensis</i>	0.5 1.0
Switchgrass <i>Panicum virgatum</i>	0.25

¹Pure Live Seed

Mix 2 -Wet Mesic Prairies consisting of somewhat poorly drained (SPD) soils or poorly drained (PD) soils with drainage:

Mix 2 Species	lbs./acre of PLS
Switchgrass <i>Panicum virgatum</i>	0.25
Virginia Wildrye <i>Elymus virginicus</i>	2.0
Indiangrass <i>Sorghastrum nutans</i>	1.5
Big Bluestem <i>Andropogon gerardii</i>	1.5

Mix 3 - Wet Prairies consisting of poorly drained (PD) and very poorly drained (VPD) soils without drainage:

Mix 3 Species	lbs./acre of PLS
Switchgrass <i>Panicum virgatum</i>	0.25
Big Bluestem <i>Andropogon gerardii</i>	1.0
Virginia Wildrye <i>Elymus virginicus</i>	2.0
Fox Sedge <i>Carex vulpinoidea</i>	2 oz./acre
Fowl Mana Grass <i>Glyceria striata</i>	4 oz./acre
Prairie Cordgrass <i>Spartina pectinata</i> , and/or Canada Blue Joint <i>Calamagrostis canadensis</i>	50 plants per acre planted in depressions

Composite List

Species	Soil Drainage	oz./ac. of PLS
Blackeyed Susan <i>Rudbeckia hirta</i>	MWD – ED	1
Button Blazing Star <i>Liatris aspera</i>	MWD – ED	2
Compass Plant <i>Silphium laciniatum</i>	SPD – WD	4
Marsh Blazing Star <i>Liatris spicata</i>	VPD – WD	2
Downy Sunflower <i>Helianthus mollis</i>	WD – ED	1
Entire-Leaf Rosinweed <i>Silphium integrifolium</i>	SPD – ED	4
False Aster <i>Boltonia latisquama</i>	VPD – SPD	1
False Sunflower <i>Heliopsis</i>	SPD – ED	1

Composite List (continued)

Species	Soil Drainage	oz./ac. of PLS
Flat Topped Aster <i>Aster umbellatus</i>	VPD – SPD	2
Gray-Headed Coneflower <i>Ratibida pinnata</i>	MWD – ED	2
New England Aster <i>Aster novae-angliae</i>	VPD – WD	1
Nodding Bur Marigold <i>Bidens cernua</i>	VPD – SPD	2
Prairie Dock <i>Silphium terebinthinaceum</i>	PD – ED	4
Riddell's Goldenrod <i>Solidago riddelli</i>	VPD – ED	1
Sawtooth Sunflower <i>Helianthus grosseserratus</i>	VPD – WD	1
Smooth Aster <i>Aster laevis</i>	MWD – ED	1
Smooth Ironweed <i>Vernonia fasciculata</i>	VPD – MWD	2
Sneezeweed <i>Helenium autumnale</i>	VPD – SPD	1
Spotted Joe Pye Weed <i>Eupatorium maculatum</i>	PD – SPD	1
Stiff Goldenrod <i>Solidago rigida</i>	MWD – ED	1
Swamp Aster <i>Aster puniceus</i>	VPD – SPD	1
Sweet Black-Eyed Susan <i>Rudbeckia subtomentosa</i>	VPD – MWD	1
Tall Coreopsis <i>Coreopsis tripteris</i>	SPD – ED	3
Wild Quinine <i>Parthenium integrifolium</i>	MWD – ED	2

Other Species List

Species	Soil Drainage	oz./ac. of PLS
Butterfly Milkweed <i>Asclepias tuberosa</i>	MWD – ED	3
Cardinal Flower <i>Lobelia cardinalis</i>	VPD – SPD	0.5
Foxglove Beardtongue <i>Penstemon digitalis</i>	VPD – MWD	1
New Jersey Tea <i>Ceanothus americanus</i>	MWD – ED	2
Obedient Plant <i>Physostegia virginiana</i>	SPD – WD	2
Ohio Spiderwort <i>Tradescantia ohioensis</i>	SPD – WD	2
Rattlesnake Master <i>Eryngium yuccifolium</i>	MWD – ED	2
Swamp Milkweed <i>Asclepias incarnata</i>	VPD – SPD	3
Virginia Blue Flag <i>Iris virginica, var. shrevei</i>	VPD – SPD	4
Virginia Mountain Mint <i>Pycnanthemum virginianum</i>	VPD – WD	1
Wild Bergamot <i>Monarda fistulosa</i>	SPD – WD	2
Prairie Willow <i>Salix humilis</i> (Shrub seedlings planted on a 6-foot by 6-foot spacing.)	SPD – ED Plant in clumps $\frac{1}{4}$ ≤ acre and not more than 5% of the restoration acres	

Legume List

Species	Soil Drainage	oz./ac. of PLS
Hoary Tick Trefoil <i>Desmodium canescens</i>	MWD – ED	3
Lead Plant <i>Amorpha canescens</i>	WD – ED	1
Partridge Pea <i>Cassia fasciculata</i>	MWD – ED	4
Roundheaded Lespedeza <i>Lespedeza capitata</i>	MWD – ED	2
Illinois Tick Trefoil <i>Desmodium illinoiense</i>	MWD – ED	2

Legume List (continued)

Species	Soil Drainage	oz./ac. of PLS
Canada Tick Trefoil <i>Desmodium canadense</i>	MWD – ED	2
White Prairie Clover <i>Petalostemum claudium</i>	WD – ED	2
White Wild Indigo <i>Baptisa leucantha</i>	SPD – ED	4
Purple Prairie Clover <i>Petalostemum purpureum</i>	MWD – ED	2
Wild Senna <i>Cassia hebecarpa</i>	VPD – WD	4

II. Low Stature Prairie Establishment

The seeding mixture will consist of one (1) of the following prairie seed mixes, plus 10 native species from the *Forb List*. **Note: low stature prairie requires a dormant seeding. Do not use low stature prairies in closed depressions that can pond water. These sites can be restored as a sedge meadow.**

Mix 1 - Mesic to Dry Prairies consisting of moderately well drained (MWD), well drained (WD), and excessively drained (ED) soils:

Mix 1 Species	lbs./acre of PLS
Prairie Dropseed <i>Sporobolus heterolepis</i>	1.5
Little Bluestem <i>Schizachyrium scoparium</i>	3.0
Sideoats Grama <i>Bouteloua curtipendula</i>	1.0
Canada Wildrye <i>Elymus canadensis</i>	2.0

Mix 2 - Wet Prairies consisting of somewhat poorly drained (SPD), poorly drained (PD), and very poorly drained (VPD) soils. *Note: Do not use on organic and/or clay soils.*

Mix 2 Species	oz./acre of PLS
Prairie Dropseed <i>Sporobolus heterolepis</i>	24
Little Bluestem <i>Schizachyrium scoparium</i>	48
Virginia Wildrye <i>Elymus virginicus</i>	32
And seed one sedge species:	
Yellow Fox Sedge <i>Carex annectans</i>	2
Fox Sedge <i>Carex vulpinoidea</i>	2
Frank's Sedge <i>Carex frankii</i>	2
Lance-Fruited Sedge <i>Carex scoparia</i>	1

Forb List

Species	Soil Drainage	oz./ac. of PLS
Button Blazing Star <i>Liatris aspera</i>	MWD – ED	2
Dense Blazing Star <i>Liatris spicata</i>	VPD – WD	2
Foxglove Beardtongue <i>Penstemon digitalis</i>	VPD – WD	1
Golden Alexanders <i>Zizia aurea</i>	VPD – WD	2
Gray Goldenrod <i>Solidago nemoralis</i>	MWD – ED	1
Virginia Mountain Mint <i>Pycnanthemum virginianum</i>	VPD – WD	1
Nodding Wild Onion <i>Allium cernuum</i>	SPD – WD	2
Obedient Plant <i>Physostegia virginiana</i>	SPD – WD	2
Plains Coreopsis <i>Coreopsis palmata</i>	SWD – ED	2
Prairie Cinquefoil <i>Potentilla arguta</i>	MWD – ED	1
Purple Prairie Clover <i>Petalostemum purpureum</i>	MWD – ED	1

Forb List (continued)

Species	Soil Drainage	oz./ac. of PLS
Rattlesnake Master <i>Eryngium yuccifolium</i>	MWD – ED	2
Riddell's Goldenrod <i>Solidago riddelli</i>	VPD – ED	1
Roundheaded Lespedeza <i>Lespedeza capitata</i>	MWD – ED	2
Sky Blue Aster <i>Aster azureus</i>	SPD – ED	1
Western Sunflower <i>Helianthus occidentalis</i>	MWD – ED	2
Wild Quinine <i>Partheniu integrifolium</i>	MWD – ED	2
Shining Aster <i>Aster firmus</i>	VPD – SPD	1
Showy Black Eyed Susan <i>Rudbeckia fulgida var. speciosa</i>	VPD – SPD	1

III. Sedge Meadow Establishment

Sedge meadows are wetlands that can be restored on areas that are dominated by hydric soils (i.e. greater than 50% hydric). Before vegetation can be established, hydrology must be restored to its natural state. Refer to IN FOTG Standard (657) Wetland Restoration to restore hydrology.

The seeding mixture will consist of:

- The *Sedge Meadow Mix*, plus
- Three (3) species from the *Sedge List*, and
- Five (5) species from the *Forb List*

Sedge Meadow Mix

Species	oz./ac. of PLS
Dark Green Bulrush <i>Scirpus atrovirens</i>	2
Virginia Wildrye <i>Elymus virginicus</i>	10
Switchgrass <i>Panicum virgatum</i>	0.25
Fowl Mana Grass <i>Glyceria striata</i>	2

Sedge List

Species	oz./ac. of PLS
Bottlebrush Sedge <i>Carex lurida</i>	3
Crested Sedge <i>Carex cristatella</i>	2
Fox Sedge <i>Carex vulpinoidea</i>	4
Frank's Sedge <i>Carex frankii</i>	4
Meadow Sedge <i>Carex granularis</i>	3
Tussock Sedge <i>Carex stricta</i>	1

Sedge Meadow Forbs List

Species	oz./ac of PLS
Blue Vervain <i>Verbena hastata</i>	1
Boneset <i>Eupatorium perfoliatum</i>	1
Cardinal Flower <i>Lobelia cardinalis</i>	1
Flat Topped Aster <i>Aster umbellatus</i>	1
Great Blue Lobelia <i>Lobelia siphilitica</i>	1
New England Aster <i>Aster novae-angliae</i>	1
Nodding Bur Marigold <i>Bidens cernua</i>	2
Obedient Plant <i>Physostegia virginiana</i>	2
Riddell's Goldenrod <i>Solidago riddellii</i>	1
Sneezeweed <i>Helenium autumnale</i>	1
Spotted Joe Pye Weed <i>Eupatorium maculatum</i>	1
Swamp Aster <i>Aster puniceus</i>	1
Swamp Milkweed <i>Asclepias incarnata</i>	3

IV. Fen Restoration

Before vegetation can be established, hydrology must be restored to its natural state as described above. Refer to IN FOTG Standard (657) Wetland Restoration to restore hydrology.

The seeding mixture will consist of:

- The *Fen Mix*, plus
- Three (3) species from the *Sedge List*, and
- Ten (10) species from the *Forb List* including at least one each of an Aster (A), Goldenrod (G), and Silphium (S).

Fen Mix

Species	oz./ac. of PLS
Dark Green Bulrush <i>Scirpus atrovirens</i>	1
Virginia Wildrye <i>Elymus virginicus</i>	48
Fox Sedge <i>Carex vulpinoidea</i>	4
Fowl Mana Grass <i>Glyceria striata</i>	2
Tussock Sedge <i>Carex stricta</i> <u>and</u> Canada Blue Joint <i>Calamagrostis canadensis</i>	50 plants each per acre

Sedge List

Species	oz./ac of PLS
Bottlebrush Sedge <i>Carex lurida</i>	2
Crested Sedge <i>Carex cristatella</i>	1
Porcupine Sedge <i>Carex hystericina</i>	2
Frank's Sedge <i>Carex frankii</i>	4
Awl-Fruited Sedge <i>Carex stipata</i>	1
Pointed Oval Sedge <i>Carex tribuloides</i>	1

Forb List

Species	oz./ac of PLS
(A) Flat Topped Aster <i>Aster umbellatus</i>	1
(A) Swamp Aster <i>Aster puniceus</i>	1
(A) New England Aster <i>Aster novae-angliae</i>	1
(G) Riddell's Goldenrod <i>Solidago riddellii</i>	1
(G) Swamp Goldenrod <i>Solidago patula</i>	1
(S) Entire-Leaf Rosinweed <i>Silphium integrifolium</i>	1
(S) Cupplant <i>Silphium perfoliatum</i>	1
(S) Prairie Dock <i>Silphium terebinthinaceum</i>	1
Angelica <i>Angelica atropurpurea</i>	1
Boneset <i>Eupatorium perfoliatum</i>	1
Dense Blazing Star <i>Liatris spicata</i>	1
Golden Alexanders <i>Zizia aurea</i>	1
Queen of the Prairie <i>Filipendula rubra</i>	0.5
Showy Black Eyed Susan <i>Rudbeckia fulgida var. speciosa</i>	2
Sneezeweed <i>Helenium autumnale</i>	1
Spotted Joe Pye Weed <i>Eupatorium maculatum</i>	1
Wild Senna <i>Cassia hebecarpa</i>	2
Virginia Mountain Mint <i>Pycnanthemum</i>	1

V. Savanna Establishment

Trees, grasses, and forbs will be planted to establish the savanna.

A. Tree Planting

Trees will be established using seedlings or container trees.

- For trees planted uniformly in rows, the density will not exceed 200 trees per acre.

- For clump planting tree density will not exceed 300 trees per acre. When clump planting is used the smallest clump will be 0.5 acres in size, and no clump will exceed 5 acres in size.

At least 50% of the trees species will be selected from the *Primary List*.

Primary List

Common Name	Scientific Name	Soil Drainage
Black Oak	<i>Quercus velutina</i>	MWD – ED
Bur Oak	<i>Quercus macrocarpa</i>	PD – ED
Chinquapin Oak	<i>Quercus muhlenbergii</i>	MWD – ED
White Oak	<i>Quercus alba</i>	SWD – WD
Swamp White Oak	<i>Quercus bicolor</i>	PD – MWD
Pin Oak	<i>Quercus palustris</i>	VPD – MWD

Remaining trees to be planted will be selected from the *Secondary List*.

Secondary List

Common Name	Scientific Name	Soil Drainage
Black Walnut	<i>Juglans nigra</i>	MWD – WD
Mockernut Hickory	<i>Carya tomentosa</i>	MWD – ED
Persimmon	<i>Diospyros virginiana</i>	MWD – WD
Scarlet Oak	<i>Quercus coccinea</i>	MWD – ED
Shagbark Hickory	<i>Carya Ovata</i>	MWD – WD
Shingle Oak	<i>Quercus Imbricaria</i>	SPD – WD

B. Native Grass Planting

Select one grass species mix as described above under, *I. Tall Grass Prairie Establishment*.

C. Forb Planting

A minimum of any ten (10) forb species will be selected from the *Composite List*, *Legume List*, or *Other Species List* with at least one species from each list.

Composite List

Species	Soil Drainage	oz./ac. PLS
Blackeyed Susan <i>Rudbeckia hirta</i>	MWD – ED	1
Button Blazing Star <i>Liatris aspera</i>	MWD – ED	2
Compass Plant <i>Silphium laciniatum</i>	SPD – WD	4
Marsh Blazing Star <i>Liatris spicata</i>	VPD – WD	2
Downy Sunflower <i>Helianthus mollis</i>	WD – ED	1
Entire-Leaf Rosinweed <i>Silphium integrifolium</i>	SPD – ED	4
False Sunflower <i>Heliopsis helianthoides</i>	SPD – ED	1
Gray-Headed Coneflower <i>Ratibida pinnata</i>	MWD – ED	2
New England Aster <i>Aster novae-angliae</i>	VPD – WD	1
Prairie Dock <i>Silphium terebinthinaceum</i>	PD – ED	4
Sawtooth Sunflower <i>Helianthus grosseserratus</i>	VPD – WD	1
Smooth Aster <i>Aster laevis</i>	MWD – ED	1
Smooth Ironweed <i>Vernonia fasciculata</i>	VPD – MWD	2
Spotted Joe Pye Weed <i>Eupatorium maculatum</i>	PD – SPD	1
Stiff Goldenrod <i>Solidago rigida</i>	MWD – ED	1
Tall Coreopsis <i>Coreopsis tripteris</i>	SPD – ED	3
Wild Quinine <i>Parthenium integrifolium</i>	MWD – ED	2

Legume List

Species	Soil Drainage	oz./ac. of PLS
Hoary Tick Trefoil <i>Desmodium canescens</i>	MWD – ED	3
Lead Plant <i>Amorpha canescens</i>	WD – ED	1
Partridge Pea <i>Cassia fasciculata</i>	MWD – ED	4
Roundheaded Lespedeza <i>Lespedeza capitata</i>	MWD – ED	2
Canada Tick Trefoil <i>Desmodium canadense</i>	MWD – ED	2
White Prairie Clover <i>Petalostemum</i>	WD – ED	2
White Wild Indigo <i>Baptisa leucantha</i>	SPD – ED	4
Purple Prairie Clover <i>Petalostemum purpureum</i>	MWD – ED	2
Wild Senna <i>Cassia hebecarpa</i>	VPD – WD	4

Other Species List

Species	Soil Drainage	oz./ac. PLS
Butterfly Milkweed <i>Asclepias tuberosa</i>	MWD – ED	3
Foxglove Beardtongue <i>Penstemon digitalis</i>	VPD – MWD	1
New Jersey Tea <i>Ceanothus americanus</i>	MWD – ED	2
Obedient Plant <i>Physostegia virginiana</i>	SPD – WD	2
Ohio Spiderwort <i>Tradescantia ohioensis</i>	SPD – WD	2
Rattlesnake Master <i>Eryngium yuccifolium</i>	MWD – ED	2
Wild Bergamot <i>Monarda fistulosa</i>	SPD – WD	2

VI. Open Oak Woodlands

If needed, trees, grasses, and forbs will be planted to establish Open Oak Woodland. Seed the following grass mix and herbaceous species (forbs) as described below.

A. Oak Woodland Grass Mix

Grass Species	lbs./ac. of PLS
Sideoats Grama <i>Bouteloua curtipendula</i>	0.5
Virginia Wildrye <i>Elymus virginicus</i>	4.0
Little Bluestem <i>Schizachyrium scoparium</i>	1.0

B. Herbaceous Species (Forbs)

Select a minimum of any ten (10) forb species from the *Composite List*, *Legume List*, or *Other Species List* with at least one species from each list as described above under, *V. Savanna Establishment*, *C. Forb Planting*.

C. Tree Planting

Trees will be planted using a minimum rate of 300 - 436 trees per acre.

At least 75% of the trees species will be selected from the *Primary List* of which 50% will be White Oak; the remaining trees will be selected from the *Secondary List*:

Primary List

Common Name	Scientific Name	Soil Drainage
Black Oak	<i>Quercus velutina</i>	MWD – ED
Bur Oak	<i>Quercus macrocarpa</i>	PD – ED
Chinquapin Oak	<i>Quercus muhlenbergii</i>	MWD – ED
White Oak	<i>Quercus alba</i>	SPD – WD

Secondary List

Common Name	Scientific Name	Soil Drainage
Black Walnut	<i>Juglans nigra</i>	MWD - WD
Flowering Dogwood	<i>Cornus florida</i>	MWD – WD
Red Oak	<i>Quercus rubra</i>	SPD – WD
Shagbark Hickory	<i>Carya Ovata</i>	MWD – WD
Shingle Oak	<i>Quercus Imbricaria</i>	SPD – WD

VII. Restoration of Existing Degraded Habitats

For sites that still have some of the characteristic species of the desired habitat type, use restoration techniques such as prescribed burning, tree thinning, woodland improvement, woody vegetation control, and inter-seeding with the desired species.

- Exotic or invasive woody herbaceous species will be controlled.
- Use Indiana NRCS FOTG Standard (338) *Prescribed Burning* to burn one third to one-half of the area every year on a rotating schedule until the desired vegetative community is established.
- If the species diversity does not increase within three (3) to five (5) years, inter-seed the desirable native species into the existing stand.
- To control encroaching woody vegetation treat all girdled trees or cut stumps with labeled herbicide.
- For Savanna and Open Oak Woodlands, control excessive stocking of trees to provide additional sunlight to existing herbaceous plants as recommended in the following table.

Savanna and Open Oak Woodland Stocking Levels

Savanna			
Ave. Tree Diameter	Trees/acre (40% canopy)	Trees/acre (30% canopy)	Trees/acre (20% canopy)
4	210	160	105
6	110	80	60
8	75	60	40
10	50	40	25
12	35	30	20
14	27	20	15
16	22	16	11
18	17	13	8
20	14	11	7
Open Oak Woodland			
Ave. Tree Diameter	Trees/acre (50% canopy)	Trees/acre (60% canopy)	
4	260	310	
6	130	170	
8	80	100	
10	65	70	
12	40	50	
14	33	38	
16	27	33	
18	23	25	
20	18	21	

CONSIDERATIONS

Consider the minimum habitat requirements of target species or other species of concern when determining the size and location of the restored area.

Consider the edge to area ratio for area sensitive target species.

Consider the potential for disturbance by restoration and/or management activities to threatened or endangered species or their habitat.

Consider varying the timing of prescribed burning (i.e. late winter vs. early spring) to enhance plant diversity.

Young trees less than 3 inches diameter at breast height can be protected from fire using firebreaks, plowed fire lines, water fire lines, or other methods.

Evaluate the site to determine if the habitat can be restored through management techniques, or if it must be planted.

Consider establishing woody vegetation large enough (3 inches at breast height) to survive prescribed burning before establishment of herbaceous plants for savannas.

Consider working with other agencies and organizations such as the U. S. Fish and Wildlife Service, Indiana Division of Fish and Wildlife, Indiana Division of Forestry, Indiana Division of Nature Preserves, The Nature Conservancy or similar organizations to develop site-specific plans.

Consider soil fertility, structure, drainage, aspect and slope when selecting species.

PLANS AND SPECIFICATIONS

Plans and specifications for restoration and management of declining habitats will be in keeping with this standard and other applicable federal, state and local codes.

Plans and specifications will include:

- Site map indicating practice type and acreage.
- Necessary management practices.
- Site preparation.
- Species selection and seeding rates.
- Planting dates, care, and handling of seed and plant material.
- A soil map.

OPERATION AND MAINTENANCE

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:

- Undesirable woody vegetation. Undesirable woody vegetation will be controlled to maintain prairies and sedge meadows. Small woody vegetation may be removed by mowing or using prescribed burning. Larger woody vegetation can be controlled by girdling the stem and/or applying herbicides.

- Prescribed Burning. Grassland communities are best managed by the use of prescribed burning. When prescribed burning is not feasible, mowing (to set back woody or broadleaf species) or light disking (to set back excessive grass growth) may be used as a maintenance measure. See below for details.

During the establishment of prairies, mowing or prescribed burning should be conducted every year. After establishment prescribed burning can be conducted every third year or as needed to best manage the site. Prescribed burning will take place during the dormant season. When NRCS recommends prescribed burning, a qualified person will develop a burn plan according to Indiana NRCS policy.

- Mowing. Mow only during the establishment period.

Mow no more than 1/4 to 1/3 of the field every year. Rotate mowed strips across the field.

If mowing is used during establishment for weed control, mow high enough so the desired vegetation is not disturbed. Mow when competing weeds are taller than the planted vegetation, and at a height above the planted vegetation. Planted grasses and wildflowers should not be mowed lower than six (6) inches to ensure plant health.

When mowing, care must be taken so that residue does not accumulate and smother the plants.

- Spraying. To benefit insect food sources for grassland nesting birds, spraying or other control of noxious weeds will be done on a "spot" basis to protect forbs and legumes that benefit native pollinators and other wildlife.
- Invasive and Noxious Species. Management measures will be provided to control invasive species and noxious weeds in order to comply with state noxious weed laws.

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