

Open Woodland/Oak Savanna Restoration Job Sheet

Natural Resources Conservation Service (NRCS)
Missouri Department of Conservation (MDC)
University of Missouri Extension – The School of Natural Resources

For:	County:
Field(s):	Farm #:
Date:	Tract #:
Designed By:	Contact Information:

PURPOSE

Restoration of an existing degraded Open Woodland or Oak Savanna, to provide suitable habitat for species dependant on these natural communities.

DEFINITIONS

Open woodland (top photo) is more than another general term for a forest. Ecologically, true open woodlands are a type of wooded community characterized as having a canopy cover of overstory trees of 30 to 80%. The open understory and sparse canopy allows sunlight to reach the ground promoting growth of a diverse herbaceous layer of forbs, grasses, and sedges. Most open **degraded** woodlands today have become an overstocked closed canopy community with little to no ground flora and often appear similar to a forest community.

Oak savannas (bottom photo) are grassland interspersed with “**open-grown**” scattered trees or groupings of trees of various ages. Also known as “oak openings” oak savanna canopy ranges from 10% to 30% and have a prairie-like herbaceous understory devoid of a shrub layer. This community is often associated with large prairies on dissected plains dominated by prairie grasses and forbs. The landscape where oak savannas historically occurred were conducive to frequent, high intensity fires. Very little of this community is present today due to fire suppression and conversion to agriculture.

“**Open-grown**” trees occurring in both open woodlands and oak savannas are typically fire tolerant species with wide spreading crowns and generally extensive lower branching. Restoration of these communities often begin with thinning existing woody vegetation and reintroducing prescribed fire in effort to stimulate the once diverse plant community.

When restoring either of these communities refer to the Restoration and Management of Rare or Declining Habitats (643) standard for details. **Both communities require Prescribe Burning (338) as part of this practice.** Never conduct a fire without a prescribed burn plan.



Top photo by Chad Smith MDC, Bottom photo Courtesy MDC

**NRCS/MDC/UMC
Missouri**

SPECIFICATIONS

Site preparation is planned as follows (check all that applies):

- Site has been identified as an **Open Woodland** complex – transitional/timber soils that comprise at least 50 percent of the field – using the Native Vegetation List for Missouri soils (see the eFOTG Section II, G. Ecological Site Info)
- Site has been identified as an **Oak Savanna** complex – transitional soils comprise at least 50 percent of the field – using the Native Vegetation List for Missouri soils (see the eFOTG Section II, G. Ecological Site Info)
- Removal of excessive stocking of woody vegetation
- Chemical control of invasive or aggressive herbaceous vegetation
- Mechanical methods for woody vegetation removal, preferred is chainsaw by hand – **heavy equipment should be highly discouraged***.
- Prescribed burning based on a current approved prescribed burn plan
- Other:

*Refer to Restoration and Management of Rare or Declining Habitats (643) - General Specifications Applicable to all Habitats for details on heavy machinery use.

Existing woody vegetation will need to be removed to restore the desired plant community. A combination of practices may be used to reach your objectives. After removal of woody vegetation 30% to 80% canopy coverage should remain for an open woodland, and 10%-30% for an oak savanna community. Cut stumps, other than cedar or pine, should be treated with an approved herbicide to prevent resprouting. For more information on controlling and removing woody vegetation see Controlling Undesirable Trees and Shurbs (IS-MO666cut) information sheet.

Field	Planned Treatment	Species Removed	Percent Canopy Remaining	Time of Treatment

PLANTING

Implementation of Prescribed Burning and reducing woody vegetation cover will usually restore plant communities on these rare habitats. Planting is not recommended until after evaluating the response of vegetation to this management.

Once a remnant open woodland or oak savanna complex has had the selected overstocked woody vegetation removed from it and management implemented, a seeding is not typically needed. There is usually an adequate seed bank in the soil. The prescribed burning that will take place to maintain the health of the community will provide the grasses and forbs within the seedbank the opportunity to naturally regenerate. Therefore it is recommended not to attempt any herbaceous planting until after implementing at least one prescribed burn and monitoring natural response. Some natural community systems will take longer to respond in that case you may want to over seed or establish a new plant community. Dormant seeding is the preferred method of establishment for native forbs, grasses and sedges (most successful plantings are completed between November 16 and January 31. For more details on establishing forbs reference Native Forb Information Sheet (IS-MO643forbs).

The site, when needed, will be planted:

- Dormant seeding (November 16 – March 15 for Northern Missouri)
- Dormant seeding (December 1 – February 29 for Southern Missouri)

PLANTING METHODS

Planting methods will vary from site to site, depending upon the conditions of the site. Broadcasting seed by hand may be the most practical way of planting restored open woodlands and oak savannas that are areas less than 3 acres. For hand seeding, mix the seed with an inert carrier such as cat litter, sawdust or sand to better distribute the seed over the entire area. Mix the seed and carrier at a 1:1 or 1:2 ratio. For small areas an ATV mounted spreader or seeder can also be used.

The site will be planted, when needed, using (check all that apply):

- Broadcast
- Other:

SEEDING MIXES AND LOCATION AND LAYOUT (SEE PLAN MAP)

Open woodland and oak savanna seedings require the use of Missouri source native plant materials (genetically originated from within Missouri). **Improved varieties or cultivars shall not be used for open woodland and savanna restoration projects.** Depending upon the level of restoration required, some sites may only need native forbs or grasses or both native forbs and grasses.

The forb mixture for **both open woodland and oak savannas** will be seeded at a minimum of 3 pound PLS per acre for open woodland restoration. The forb mix will contain a minimum of 10 species with no single species making up more than 15% of the mix and the mix having no more than 15% annuals/biennials species combined. See Table 1 for selections.

The native grass mixture for **oak savanna** will be planted at 4 pounds PLS per acre and require a minimum of 4 species. See Table 1 for selections. The mix must contain little bluestem at 2.8 pounds PLS per acre and all other grasses will be limited to not more than 0.4 pounds PLS per acre each. Additional grass species can be added for diversity to equal the total mix pounds.

The native grass mixture for **open woodland** will be planted at 3 pounds PLS per acre and requires a minimum of 3 species. See Table 1 for selections. The mix must contain one of the following (Sideoats Grama or broom sedge) at 1.4 pound PLS per acre and Little bluestem at 1.2 pound PLS per acre. All other grasses will be limited to not more than 0.4 pounds PLS per acre each. Additional grass species can be added for diversity to equal the total mix pounds.

Open Woodland or

Oak Savanna

Field(s)	Restoration practice	Acres to be seeded	Missouri Native Forb Mix (Total Pounds)	Missouri Native Grasses	Total Pounds (by specie)

OPERATION AND MAINTENANCE: Care after Planting

Prescribed burning is essential to the restoration and management of both open woodland and oak savanna communities. Long term management is not feasible without prescribed burning even if other management methods are used.

First year maintenance: Removal of competing vegetation is normally carried out for one growing season following establishment. The use of approved herbicides may be needed to control noxious weeds and undesirable plants during the establishment period. Avoid the use of broad spectrum herbicides and spot treat infestations with a selective herbicide.

Long-term Management: Once the stand is established the introduction of management practices, such as prescribed burning is essential to maintain the vegetative community. Management practice will vary by program and landowner objectives.

REFERENCES:

Refer to the following job sheets, information sheets or detailed management plan for additional information.

- JS-BIOL-15 Prescribed Burning for Wildlife
- JS-BIOL-20 Native Forb and Non-native Legume Interseeding
- JS-BIOL-23 Woody Cover Control- Prairie/Glade/Savanna
- JS-BIOL-30 Controlling Undesirable Species
- JS-MO612 Tree and Shrub Establishment
- IS-MO338 Prescribed Burning Information Sheet

- IS-MO643G Glade Information Sheet
- IS-MO643P Prairie Information Sheet
- IS-MO643S Savanna Information Sheet
- IS-MO643forbs Native Forb Information Sheet
- IS-MO666cut Controlling Undesirable Trees and Shrubs

Comment:



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TABLE 1 – APPROVED GRASS/GRASS LIKE AND APPROVED FORBS – species selection will only be made from appropriate habitat type based on planting site evaluation. For open woodland use species suited for glades and denoted by “G”

Common Name	Scientific Name	Habitat Type *
GRASSES/GRASS LIKE		
Winter bent grass	<i>Agrostis hyemalis</i>	S
Big bluestem	<i>Andropogon gerardii</i>	S, G
Splitbeard bluestem	<i>Andropogon ternarius</i>	G
Broomsedge	<i>Andropogon virginicus</i>	S, G
Sideoats grama	<i>Bouteloua curtipendula</i>	S, G
River oats	<i>Chasmanthium latifolium</i>	S
Canada wildrye	<i>Elymus canadensis</i>	S
Virginia wildrye	<i>Elymus virginicus</i>	S, G
Cluster fescue	<i>Festuca paradoxa</i>	S
Junegrass	<i>Koeleria cristata</i>	S
Switchgrass	<i>Panicum virgatum</i>	S, G
Little bluestem	<i>Schizachyrium scoparium</i>	S, G
Tall nutgrass	<i>Scleria triglomerata</i>	S, G
Indian grass	<i>Sorghastrum nutans</i>	S, G
Tall dropseed	<i>Sporobolus compositus</i>	S, G
Prairie dropseed	<i>Sporobolus heterolepis</i>	S, G
Purple top	<i>Tridens flavus</i>	S
Eastern gamagrass	<i>Tripsacum dactyloides</i>	S
Short's sedge	<i>Carex shortiana</i>	S
Six weeks fescue	<i>Vulpia octoflora</i>	S, G

* S = Oak Savanna, G = Glade-use for Open Woodland seeding

APPROVED FORBS

Common Name	Scientific Name	Habitat Type *
FORBS		
Leadplant	<i>Amorpha canescens</i>	S, G
Purple milkweed	<i>Asclepias purpurascens</i>	S
Butterfly milkweed	<i>Asclepias tuberosa</i>	S, G
Sky blue aster	<i>Aster azureus</i>	S
Smooth aster	<i>Aster laevis</i>	S
Aromatic aster	<i>Aster oblongifolius</i>	G
Purple daisy aster	<i>Aster patens</i>	
Silky aster	<i>Aster sericeus</i>	G
White wild indigo	<i>Baptisia alba</i>	S, G

Common Name	Scientific Name	Habitat Type *
Blue wild indigo	<i>Baptisia australis</i>	S, G
Cream wild indigo	<i>Baptisia bracteata</i>	G
Purple poppy mallow	<i>Callirhoe involucrata</i>	G
Partridge pea (A)	<i>Cassia fasciculata</i>	S, G
Indian paintbrush (A)	<i>Castilleja coccinea</i>	G
New Jersey tea	<i>Ceanothus americanus</i>	S, G
Coreopsis	<i>Coreopsis lanceolata</i>	G
Finger/Prairie Coreopsis	<i>Coreopsis palmata</i>	S, G
Plains coreopsis	<i>Coreopsis tinctoria</i>	G
Tickseed coreopsis	<i>Coreopsis tripteris</i>	S, G
Rattlebox	<i>Crotalaria sagittalis</i>	G
White prairie clover	<i>Dalea candida</i>	S, G
Purple prairie clover	<i>Dalea purpurea</i>	S, G
Illinois bundle flower	<i>Desmanthus illinoensis</i>	G
Showy tick trefoil	<i>Desmodium canadense</i>	S, G
Beggar's lice	<i>Desmodium canescens</i>	S, G
Shooting star	<i>Dodecatheon meadia</i>	S, G
Pale purple coneflower	<i>Echinacea pallida</i>	S, G
Yellow coneflower	<i>Echinacea paradoxa</i>	S, G
Purple coneflower	<i>Echinacea purpurea</i>	S, G
Ozark glade coneflower	<i>Echinacea simulata</i>	S, G
Rattlesnake master	<i>Eryngium yuccifolium</i>	S, G
Flowering spurge	<i>Euphorbia corollata</i>	S, G
Curly cup gum plant	<i>Grindelia lanceolata</i>	S, G
Sawtooth sunflower	<i>Helianthus grosseserratus</i>	G
Ashy Sunflower	<i>Helianthus mollis</i>	G
Western sunflower	<i>Helianthus occidentalis</i>	G
Woodland sunflower	<i>Helianthus strumosus</i>	S
Ox-eye/false sunflower	<i>Heliopsis helianthoides</i>	S, G
Alum root	<i>Heuchera richardsonii</i>	G
Roundhead lespedeza	<i>Lespedeza capitata</i>	S, G
Lespedeza hirta	<i>Lespedeza hirta</i>	S, G
Slender lespedeza	<i>Lespedeza virginica</i>	S, G
Rough blazing star	<i>Liatris aspera</i>	S, G
Glade blazing star	<i>Liatris mucronata</i>	S, G
Blazing star	<i>Liatris pycnostachya</i>	G
Squarrosa blazing star	<i>Liatris squarrulosa</i>	S, G
Sensitive briar	<i>Mimosa nuttalli</i>	S, G
Savanna bergamot	<i>Monarda bradburiana</i>	S, G
Bergamot	<i>Monarda fistulosa</i>	S, G
Missouri Primrose	<i>Oenothera missouriensis</i>	G
Sampson's snakeroot	<i>Orbexilum pedunculatum</i>	S
Spanish needles	<i>Palafoxia callosa</i>	S, G
Wild quinine	<i>Parthenium integrifolium</i>	S, G
Lousewort/Wood betony	<i>Pedicularis canadensis</i>	G
Purple beardtongue	<i>Penstemon cobaea</i>	S, G

Common Name	Scientific Name	Habitat Type *
Beardtongue	<i>Penstemon digitalis</i>	G
Prairie beardtongue	<i>Penstemon tubaeiflorus</i>	S
Obedient plant	<i>Physostegia virginiana</i>	S, G
Prairie cinquefoil	<i>Potentilla arguta</i>	G
Slender mountain mint	<i>Pycnanthemum tenuifolium</i>	S, G
Prairie coneflower	<i>Ratibida columnifera</i>	G
Gray-head coneflower	<i>Ratibida pinnata</i>	S, G
Black-eyed Susan (B)	<i>Rudbeckia hirta</i>	S, G
Missouri Black-eyed Susan	<i>Rudbeckia missouriensis</i>	G
Wild petunia	<i>Ruellia humilis</i>	G
Pitchers sage	<i>Salvia azurea</i>	G
Maryland senna	<i>Senna marilandica</i>	S
Royal catchfly	<i>Silene regia</i>	S
Rosinweed	<i>Silphium integrifolium</i>	S, G
Compass Plant	<i>Silphium laciniatum</i>	G
Prairie dock	<i>Silphium terebinthinaceum</i>	S, G
Gray goldenrod	<i>Solidago nemoralis</i>	S, G
Savanna goldenrod	<i>Solidago petiolaris</i>	S, G
Rigid/Stiff goldenrod	<i>Solidago rigida</i>	S, G
Showy goldenrod	<i>Solidago speciosa</i>	S
Goat's rue	<i>Tephrosia virginiana</i>	S, G
Ohio spiderwort	<i>Tradescantia ohiensis</i>	S
Wingstem sunflower	<i>Verbesina helianthoides</i>	S
Culver's root	<i>Veronicastrum virginicum</i>	S
Golden alexander	<i>Zizia aurea</i>	S, G

* S = Oak Savanna, G = Glade-use for Open Woodland seeding

A = Annual

B = Biennial