

Savanna Information Sheet

Missouri Information Sheet

IS-MO-643Savanna

Natural Resources Conservation Service (NRCS)
January 2017

Missouri Conservation Practice 643

Designing an Oak Savanna

What is an Oak Savanna?

Although definitions vary, one common definition is: *an oak savanna is a plant community with scattered “open-grown” fire tolerant oak trees*. Other terms for these savannas are “oak openings” and “barrens”. In contrast to a forest, which has a closed canopy, the oak savanna canopy ranges from about 10% to 30%. In such a habitat, the ground layer receives sun and shade, which permits growth of a wide diversity of grasses and flowering plants. These prairie species include big and little bluestem grass and many goldenrods and asters.



Early settlers to the Midwest described the park-like setting of oak savannas. At one time these savannas and woodlands were common throughout the landscape of Missouri. An oak savanna is a transitional form between tall grass prairie in the west and deciduous forest in the east. Although there is a continuum from prairie to savanna to forest, oak savannas are still considered a distinct vegetation type.

An oak savanna is a fire-controlled vegetation community. With settlement, fires were eliminated and the savanna changed into denser forested landscapes, losing the characteristic open tree canopy with grass and forb understory. Grazing by bison and elk may also have helped keep the savanna open. When settlement eliminated these animals and fire from Missouri, most of the

savanna acreage experienced an invasion by dense shrub and tree growth.

Oak savannas, in good condition, have their own characteristic and complex communities of ground-layer grasses, flowering plants, and shrubs. A few examples of flowering plants of Missouri savanna’s include white wild indigo (*Baptisia leucantha*), lead plant (*Amorpha canescens*), purple coneflower (*Echinacea purpurea*), round-headed bush clover (*Lespedeza capitata*) and blue aster (*Aster anomalis*). Common savanna shrubs are New Jersey tea (*Ceanothus americanus*), hazelnut (*Corylus americana*), and pasture rose (*Rosa carolina*).

Oak savannas are now considered one of the most threatened plant communities in the Midwest and among the most threatened in the world. Less than 0.01% of the original savanna community remains.

What Should an Oak Savanna Look Like?

Savanna design for a new undeveloped field should take into account management objectives, topography, soils, presettlement history and cost.



Savanna Restoration

Savanna restoration will only be applied on fields with ecological site map units designated as “savanna” that have map units containing a major component tied to a savanna ecological site comprising over 50% of the field.

For existing wooded communities of oak dominated stands, reduce current stocking to levels shown in the following chart.

<i>Average tree diameter (canopy trees only)</i>	<i>Trees per acre (10 % canopy)</i>	<i>Trees per acre (20 % canopy)</i>	<i>Trees per acre (30 % canopy)</i>
4	55	105	160
6	40	60	80
8	20	40	60
10	15	25	40
12	10	20	30
14	7	15	20
16	5	11	16
18	4	8	13
20	3	7	11

NOTE: These numbers represent full crown development.

In some cases 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 (see the Glade, Prairie, and Savanna Herbaceous Establishment Job Sheet for more information). Following the above guidelines will create approximating a 10, 20, or 30 percent canopy cover for any given average tree diameter (desired result for oak savanna restoration is 10-30% tree canopy). As stands move into larger diameter classes additional removals may be necessary to maintain desired canopy cover (trees/acre).

New Savanna Development

Savanna restoration will only be applied on fields with ecological site map units designated as “savanna” that have map units containing a major component tied to a savanna ecological site comprising over 50% of the field.

Seed for restoration with cost-share must follow the RESTORATION and MANAGEMENT of RARE or DECLINING HABITATS (643) conservation practice which requires plant material selection based on:

1. The use of Missouri Source Identified Class (herbaceous material) – Missouri source is defined as a native plant that source genetically originated in Missouri; was not introduced; and existed within the state borders prior to arrival of settlers. The location of the wild growing parents must be within Missouri and implies that the geographical location is known.
2. All seed from herbaceous material shall comply with Missouri seed laws including Missouri Crop Improvement Association guidance. All seed will comply with AOSCA (Association of Official Seed Certifying Agencies) certification procedures (including appropriate tagging) to include third-party verification by the Missouri Crop Improvement Association of source, genetic identity, and genetic purity of wildland collected or field or nursery grown plant germplasm materials. Seed must be Missouri origin (grown in Missouri) and certified as Missouri Source Identified Class. If Missouri origin (grown) source Identified class seed is not available Missouri source identified class seed may be obtained only from adjoining states.



Source Identified Certification means:

- Parent seed is collected from natural remnant Missouri populations
- No selection, testing, or breeding for specific traits
- Production fields are inspected to verify species, source, and lack of noxious weeds.
- Seed is certified for purity and germination.

A minimum of two tree species will be used from the species list below, based on the corresponding ESD. Shrub plantings are optional but will result in a more complete restoration. If desired, plant at least one shrub species from the list below based on the corresponding ESD.

Suggested Trees:

Black oak	<i>Quercus velutina</i>	White oak	<i>Quercus alba</i>
Blackjack oak	<i>Quercus marilandica</i>	Swamp white oak	<i>Quercus bicolor</i>
Bur oak	<i>Quercus macrocarpa</i>	Shingle oak	<i>Quercus imbricaria</i>
Chinquapin oak	<i>Quercus muhlenbergii</i>	Shagbark hickory	<i>Carya Ovata</i>
Persimmon	<i>Diospyros virginiana</i>	Mockernut hickory	<i>Carya tomentosa</i>
Post oak	<i>Quercus stellata</i>		

Shrubs:

Gray/roughleaf dogwood	<i>Cornus spp.</i>	Hazelnut	<i>Corylus americana</i>
Prairie willow	<i>Salix humilis</i>	Fragrant sumac	<i>Rhus aromatic</i>
American/Chickasaw plum	<i>Prunus spp.</i>	False indigo bush	<i>Amorpha fruticosa</i>

Tree/shrub density and layout

Plant trees at the rate of 25 trees per planted acre at no less than 30-foot spacing. Tree planted acres will be at least 10 percent but no more than 30 percent of each field. If possible plant the trees in clusters or blocks rather than evenly spaced across a field and provide group protection from fire damage. This will allow for some parts of the savanna to be more open (greater spacing or small “openings”) than other parts. Historically trees in oak savannas were more common on south and west slopes, along ridge lines and knolls, and in protected draws or ravines. Well, drained, shallow soil sites and those with gently rolling topographies that carried fire well, characteristically had more open (wider spacing) tree cover. Tree cover was more closed (closer spacing) on moist, deep soil, highly dissected, or poorly drained sites where fire usually became a less intense or frequent factor.

Shrub plantings should also be clustered dependent upon site conditions. Shrub plantings, if done, will follow the woody cover requirements in UPLAND WILDLIFE HABITAT MANAGEMENT (645). Shrubs do not count as part of the woody (tree) canopy coverage requirement.

Tree Planting Stock

Tree planting stock will be at least 3 feet tall and ½ inch caliper or greater or 3-0 to 2-1 stock. The large initial size is required to facilitate their protection from fire, and reduce competition from grass. Seedlings will be planted by hand or using an auger of appropriate size. It is recommended that container grown air root pruned stock be used because these seedlings have thick fibrous roots as opposed to a large taproot, which may be difficult to plant. Soil will be firmly packed around seedling roots.

See TREE AND SHRUB ESTABLISHMENT (612) for recommended planting stock care, planting dates, and weed control.



Suggested Oak Savanna Tree Planting Areas (See savanna design examples on pages 5-6)



*South and west facing slope-
more open tree spacing*

*Protected ravine- more
closed tree spacing*

*Ridgeline- more
open tree spacing*



Understory Planting

Species selection for grasses and forbs

Seed for restoration with cost-share must follow the RESTORATION and MANAGEMENT of RARE or DECLINING HABITATS (643) conservation practice which requires plant material selection based on:

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2. All seed from herbaceous material shall comply with Missouri seed laws including Missouri Crop Improvement Association guidance. All seed will comply with AOSCA (Association of Official Seed Certifying Agencies) certification procedures (including appropriate tagging) to include third-party verification by the Missouri Crop Improvement Association of source, genetic identity, and genetic purity of wildland collected or field or nursery grown plant germplasm materials. Seed must be Missouri origin (grown in Missouri) and certified as Missouri Source Identified Class. If Missouri origin (grown) source Identified class seed is not available Missouri source identified class seed may be obtained only from adjoining states.

Source Identified Certification means:

- Parent seed is collected from natural remnant Missouri populations
- No selection, testing, or breeding for specific traits
- Production fields are inspected to verify species, source, and lack of noxious weeds.
- Seed is certified for purity and germination.

Depending upon the level of restoration required, some sites may only need native forbs or grasses or both native forbs and grasses. Consult with a biologist to determine if only forbs, only grasses or both forbs and grasses should be seeded. **Improved varieties or cultivars shall not be used for savanna restoration projects.** Consider the site's past uses and history before planning new seeding or over-seeding and refer to the species list from the corresponding ESD. Depending upon the level of restoration required, some sites may only need native forbs or grasses or both native forbs and grasses. See Table 1 and 2 for approved grasses and forbs.

Seeding Mixture

Conservation of the monarch butterfly is critically important as it represents other pollinators and is experiencing precipitous declines, therefore, it is recommended that at least 1 species of approved milkweed (*Asclepias* spp.) is included in the seed mix (see Tables 1 and 2). Also see the **Monarch Habitat Information Sheet (IS-MO643Monarch) for more specific information related to the monarch.** The forb mixture will be seeded at a minimum of 3 pound PLS per acre for woodland restoration. A general recommendation is to plant at least three pounds of pure live seed (PLS) per acre, comprised of at least 9 species with no single species exceeding 15 percent of the total mixture. Annuals and biennials combined also should not exceed 10 percent of the mixture. A minimum of three flowering species will be included for each season (spring, summer, fall) for native pollinator plantings (see the Native Forb Information Sheet (IS-MO643Forbs) on the Missouri NRCS e-FOTG site at <http://efotg.sc.egov.usda.gov/treemenuFS.aspx> under Section IV, Upland Wildlife Habitat Management (645) standard). This helps ensure a nice diversity, and that the stand will be dominated by perennials, which will persist over time. See Tables 1 and 2 for selections.

The native grass mixture for oak savannas will be planted at 4 pounds PLS per acre and require a minimum of 4 species. See Table 1 and 2 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.



Long Term Management of Degraded/Reestablished Savannas

At a minimum, vegetation will be controlled in a three-foot wide band around each planted tree for at least three years with an approved herbicide, weed mat, or tillage.

Fire is essential for the management of savanna communities. PRESCRIBED BURNING (338) is a required management practice for this natural community, but will not be applied to the areas planted in trees until determined by a resource planning professional that the trees have developed sufficient fire resistance. Trees may need to reach 3 to 6 inches diameter at breast height before fire resistant. Never conduct a fire without a written prescribed burn plan.

For planted habitats prescribed burning should be conducted no earlier than the beginning of the third growing season in areas devoid of trees. Burning in the late fall or winter will encourage the native forbs and reduce damage to trees.

For existing habitats in restoration prescribed burning should be conducted every year for 3-5 years. An aggressive burn regime (burn every 1 to 3 years) on degraded native communities for several years may be necessary to reach the desired vegetative state. After this restoration period, maintenance prescribed burning should be on a three or four-year schedule or as recommended by a resource planning professional. For planted habitats prescribed burning will be conducted no earlier than the beginning of the second growing season in areas devoid of trees. For greatest habitat benefit savannas should only be burned July 16 - March 15. Prescribed burning beyond March 15 for wildlife management purposes will be based on recommendation of NRCS or MDC wildlife planner. Late summer/fall/dormant season burns encourage the forb component of herbaceous stands resulting in better and more diverse habitat. Special effort/consideration will need to be followed if burning in areas where trees are actively growing. Undesirable woody vegetation will be controlled. See IS-MO338 Prescribed Burning Information Sheet.

PRIMARY HABITAT CONSIDERATIONS:

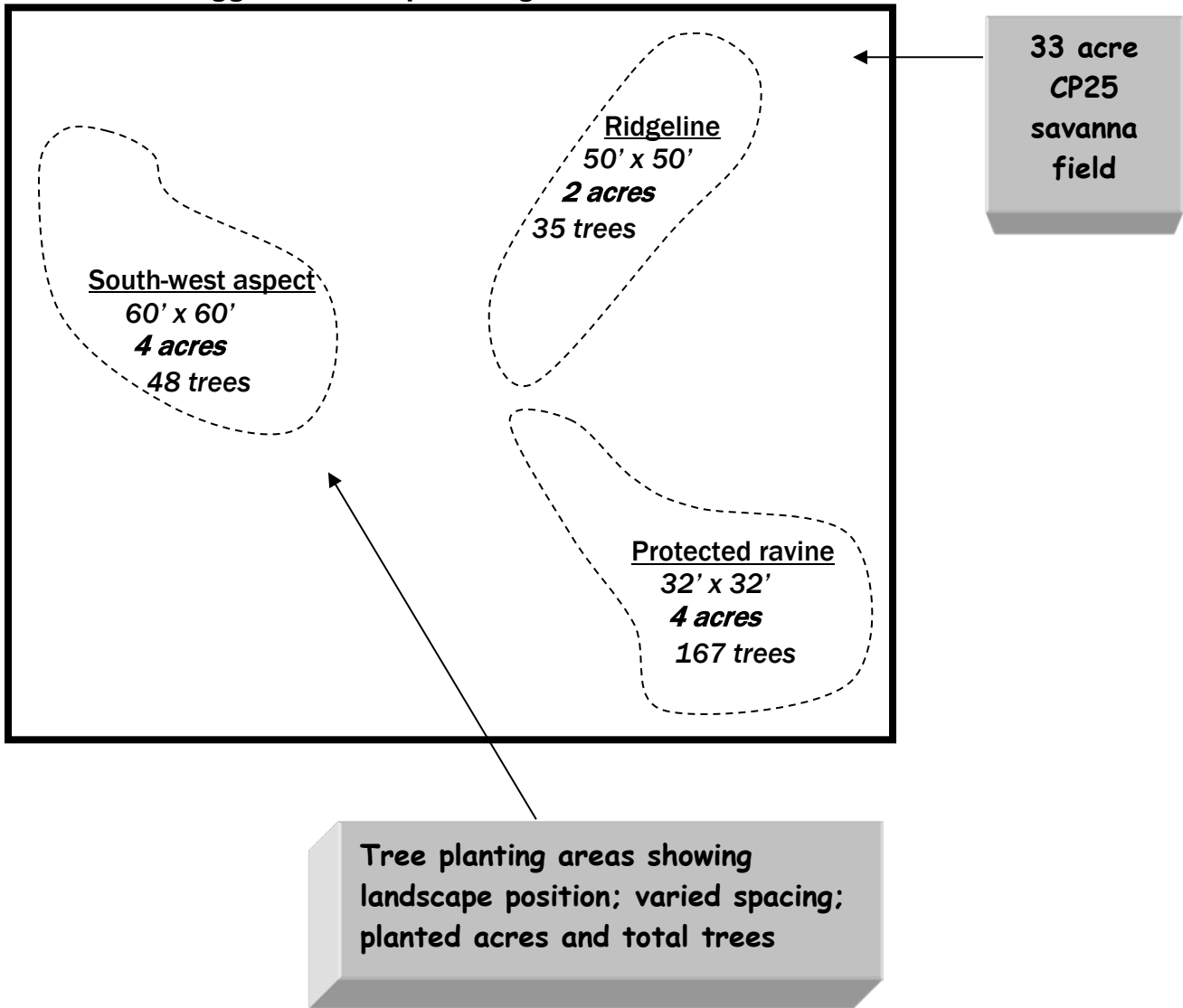
- RESTORATION and MANAGEMENT of RARE or DECLINING HABITATS (643).
- Provide natural food and cover for many declining animal species.

For additional information on savannas, contact your local USDA Service Center or Missouri Department of Conservation office.

Savanna Design and Layout Example:

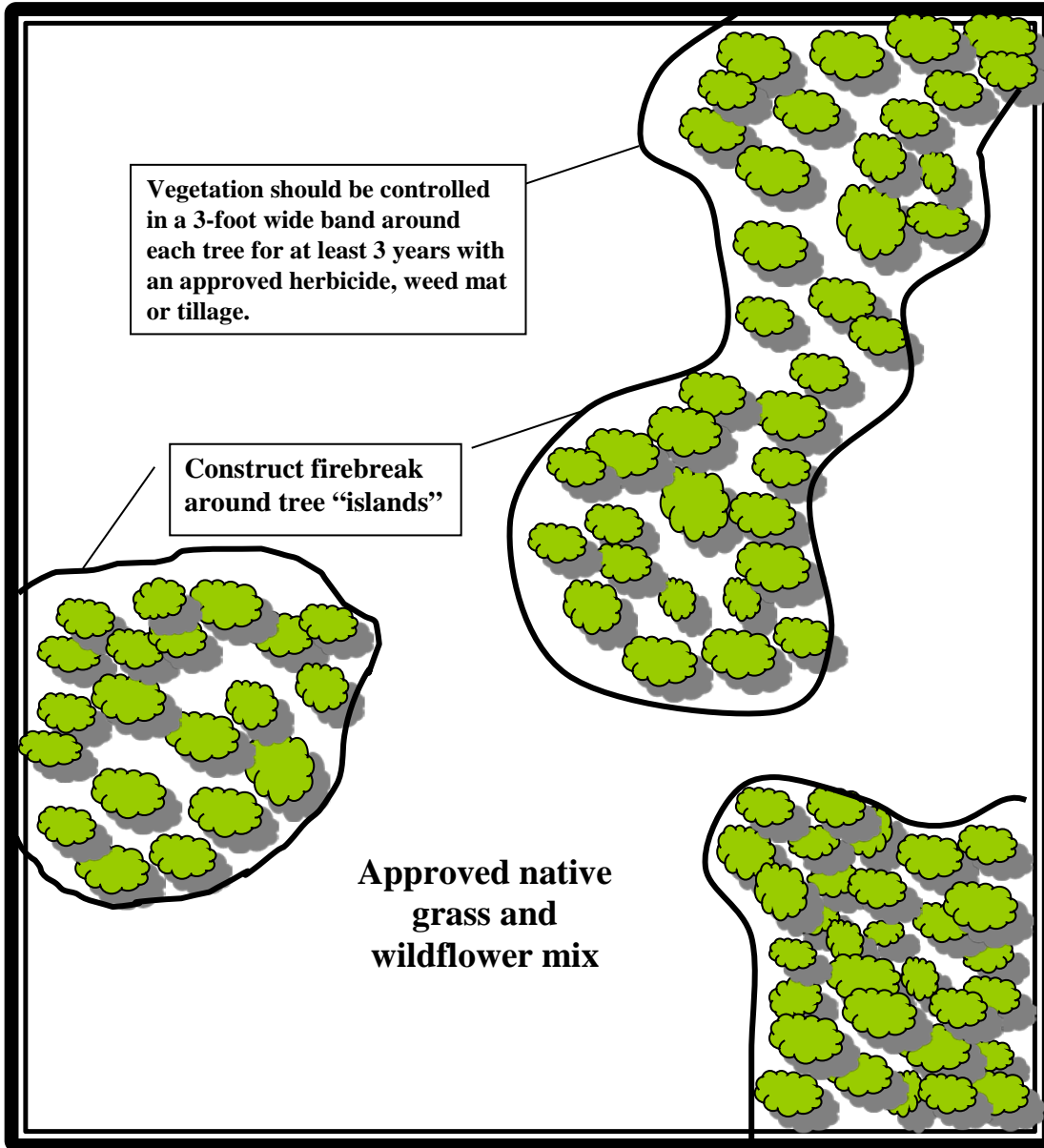
- 33 acre CP25 savanna contract
- landowner desires 30% tree cover (33 acres x 30% = 10 acres of planted trees)
- 643 standard requires 25 trees per planted acre and a tree spacing no closer than 30' x 30'
- 250 total trees required (25 trees/acre x 10 acres = 250 trees)

Suggested Example Design



Savanna Layout Example:

Plant trees in clusters or groups, leaving open contiguous grassland through the field. This will help when conducting a prescribed burn.



UNIVERSITY OF MISSOURI
Extension



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TABLE 1 – APPROVED GRASS/GRASS LIKE – species selection will only be made from appropriate habitat type based on planting site evaluation.

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

* S = Oak Savanna, DP = Dry Prairie, MP = Mesic Prairie, WP = Wet Prairie, G = Glade



TABLE 2 – APPROVED FORBS - species selection will only be made from appropriate habitat type based on planting site evaluation.

<u>Common Name</u>	<u>Scientific Name</u>	<u>Habitat Type *</u>	<u>Flower Information **</u>	<u>General Information ***</u>
Alum root	<i>Heuchera richardsonii</i>	DP, MP, G	1,2 - Sp - Su	Calyx is mainly green, may have cream colored tips.
Anemone, Meadow	<i>Anemone canadensis</i>	WP	1 - LS – Su, showy	
Aster, Aromatic	<i>Symphyotrichum oblongifolius</i>	DP, MP, G	2 - LSu – F, showy	POL, Fragrant, prefers drier sites.
Aster, New England	<i>Symphyotrichum novae-angliae</i>	WP	2 - LSu – F, showy	POL, Prefers wetter sites, leaves clasp the stem
Aster, Southern Prairie	<i>Aster paludosus</i>	DP, S, MP	2,3 – LSu - EF	
Aster, Purple daisy	<i>Symphyotrichum patens</i>	S, DP, MP, G	2 - LSu - F	POL
Aster, Silky	<i>Symphyotrichum sericeum</i>	DP, G	2 - LSu – F, showy	POL
Aster, Skyblue	<i>Symphyotrichum oolentangiense</i>	S, DP MP	2 - LSu – F, showy	POL
Aster, Smooth	<i>Symphyotrichum laevis</i>	S, DP, MP	2 - LSu – F, showy	POL
Aster, White upland	<i>Solidago ptarmicoides</i>	S, MP, DP, G	2,3 – LSu - EF	
Aster, Willowleaf	<i>Symphyotrichum praealtum</i>	WP	2,3 - LSu – F,	POL, Pale lavender color, likes moist areas
Barbara’s button	<i>Marshallia caespitosa</i>	DP, MP, WP	1 - LS - ESu	Foliage green through winter.
Bean, Small Fuzzy	<i>Strophostyles leiosperma</i>	DP, MP, S	2,3 – ESu - MF	
Beardtongue	<i>Penstemon digitalis</i>	DP, MP, WP, G	1 - LS – MSu, showy	POL
Beardtongue, Prairie	<i>Penstemon tubaeflorus</i>	S, DP, MP	1 - LS – MSu, showy	POL
Beardtongue, Purple	<i>Penstemon cobaea</i>	S, DP, G	1,2 - LS – ESu, showy	POL
Beggar tick (A)	<i>Bidens frondosa</i>	WP	2 - Su, showy	Food
Beggar's lice	<i>Desmodium canescens</i>	S, DP, MP, G	1,2 - LS – Su, showy	Legume, food
Bergamot, Wild	<i>Monarda fistulosa</i>	S, DP, MP, WP, G	2,3 - LS – EF, showy	POL, mint
Bergamot, Savanna	<i>Monarda bradburiana</i>	S, DP, G	2,3 - LS – EF, showy	POL, mint
Black-eyed Susan (B)	<i>Rudbeckia hirta</i>	S, DP, MP, G	2,3 - LS – F, showy	Food
Black-eyed Susan, Missouri	<i>Rudbeckia missouriensis</i>	DP, G	2,3 - ESu – F, showy	Food, blooms for a long period.
Blazing Star, Eastern	<i>Liatriis scariosa</i>	S, DP, MP	2,3 LSu-EF	POL, blooms during monarch migration.
Blazing star, Prairie	<i>Liatriis pycnostachya</i>	DP, MP, WP, G	2,3 - MSu – F, showy	POL, blooms during monarch migration.
Blazing star, Glade/Narrow-leaved	<i>Liatriis mucronata</i>	S, DP, G	2,3 - MSu – F, showy	POL, blooms during monarch migration.
Blazing star, Rough	<i>Liatriis aspera</i>	S, DP, G	2,3 - MSu – F, showy	POL, blooms during monarch migration.
Blazing star, Squarrosa	<i>Liatriis squarrosa</i>	S, DP	2,3 - MSu – EF, showy	POL, blooms during monarch migration.
Blazing star, Squarrulosa	<i>Liatriis squarrulosa</i>	S, DP, MP, G	2,3 MSu – EF, showy	POL, blooms during monarch migration.



<u>Common Name</u>	<u>Scientific Name</u>	<u>Habitat Type *</u>	<u>Flower Information **</u>	<u>General Information ***</u>
Blue lobelia	<i>Lobelia siphilitica</i>	WP	2,3 MSu – F, showy	POL
Blue-eyed grass	<i>Sisyrinchium campestre</i>	DP	1,2 - LS - ESu	Resembles grass
Boneset	<i>Eupatorium perfoliatum</i>	WP	2,3 - MSu - F	POL
Brown-eyed Susan	<i>Rudbeckia triloba</i>	S, WP	2,3 - Su – F, showy	Food
Bunchflower	<i>Melanthium virginicum</i>	MP, WP, S (Wet)	2 – ESu - LSu	
Cardinal flower	<i>Lobelia cardinalis</i>	WP	2,3 - MSu – EF, vivid red, showy	POL
Catchfly, Royal	<i>Silene regia</i>	S, DP, MP	1,2,3 - LS – F, showy	Blooms for a long period. Flowers 2 nd year.
Clover, Purple prairie	<i>Dalea purpurea</i>	S, DP, MP, G	1,2 - LS – Su, showy	POL, legume
Clover, White prairie	<i>Dalea candida</i>	S, DP, MP, G	1,2 - LS – Su, showy	POL, legume
Compass Plant	<i>Silphium laciniatum</i>	DP, MP, WP, G	1,2 - LS – Su, showy	POL, food
Coneflower, Gray-head	<i>Ratibida pinnata</i>	S, DP, MP, G	1,2,3 - LS – F, showy	POL, food, robust perennial. Extensive root system reduces erosion.
Coneflower, Ozark glade	<i>Echinacea simulata</i>	S, DP, MP, G	1,2 - LS – MSu, showy	POL
Coneflower, Pale purple	<i>Echinacea pallida</i>	S, DP, MP, G	1,2 - LS – MSu, showy	POL
Coneflower, Prairie	<i>Ratibida columnifera</i>	DP, MP, G	1,2,3 - LS – EF, showy	Ray flowers sometimes marked with dark red. Weak perennial on good soil.
Coneflower, Purple	<i>Echinacea purpurea</i>	S, MP, WP, G	1,2,3 - LS – F, showy	POL, prolific bloomer, flowers over a long period.
Coneflower, Black-eyed Susan, Sweet	<i>Rudbeckia subtomentosa</i>	MP, WP	2 - Su, showy	Food
Coneflower, Yellow	<i>Echinacea paradoxa</i>	S, DP, G	1,2 - LS – ESu, showy	POL
Coreopsis, Lanceleaf	<i>Coreopsis lanceolata</i>	DP, MP, G	1,2 - LS – MSu, showy	POL, food
Coreopsis, Finger/Prairie	<i>Coreopsis palmata</i>	S, DP, MP, G	1,2 - LS – MSu, showy	Food
Coreopsis, Plains (A)	<i>Coreopsis tinctoria</i>	DP, G	1,2 - Sp – ESu, showy	Food
Coreopsis, Tickseed/Tall	<i>Coreopsis tripteris</i>	S, DP, MP, WP, G	1,2 - LS – MSu	Food
Coreopsis, Big flower	<i>Coreopsis grandiflora</i>	DP, MP	1,2 - LS – MSu, showy	Food
Culver's root	<i>Veronicastrum virginicum</i>	S, MP, WP	2 - Su, showy	POL, Whorled leaves.
Cup plant	<i>Silphium perfoliatum</i>	WP	2,3 - Su – F, showy	POL
Curly cup gum plant	<i>Grindelia squarrosa</i>	S, DP, MP, G	2,3 - Su - F	
Dragonhead, Narrow-leaved false	<i>Physostegia angustifolia</i>	S, DP, MP	2,3 – LSu - EF	
Flag, Blue	<i>Iris virginica shrevei</i>	WP	1,2 - LS – MSu, showy	Forms large colonies
Flag, Copper	<i>Iris fulva</i>	MP, WP	1 - Sp, showy	
Flax, Yellow	<i>Linum medium</i>	DP, MP	1,2 – LS - LSu	
Foxglove, Fascicled false	<i>Agalinis fasciculata</i>	DP, MP	2,3 – MSu - EF	
Gaura, Large-flowered	<i>Gaura longiflora</i>	DP, MP, WP, S	2,3 – MSu - EF	



<u>Common Name</u>	<u>Scientific Name</u>	<u>Habitat Type *</u>	<u>Flower Information **</u>	<u>General Information ***</u>
Germander, American	<i>Teucrium canadense</i>	S, DP, MP, WP	2,3 - ESu - EF	
Goat's rue	<i>Tephrosia virginiana</i>	S, DP, MP, G	1,2 - LS - MSu, showy	Legume, may have pink/cream flowers.
Golden alexander	<i>Zizia aurea</i>	S, DP, MP, WP, G	1,2 - LS - ESu	Blooms for a long period in the spring.
Goldenrod, Gray	<i>Solidago nemoralis</i>	S, DP, MP, G	2,3 - LSu - F	POL
Goldenrod, Riddell's	<i>Oligoneuron riddellii</i>	WP	2,3 - LSu - F, showy	POL
Goldenrod, Rigid/Stiff	<i>Oligoneuron rigida</i>	S, DP, MP, G	2,3 - LSu - F, showy	POL
Goldenrod, Savanna	<i>Solidago petiolaris</i>	S, DP, G	2,3 - LSu - F, showy	POL, likes partial shade.
Goldenrod, Showy	<i>Solidago speciosa</i>	S, DP, MP	2,3 - LSu - EF, showy	POL
Hyacinth , Prairie	<i>Camassia angusta</i>	MP, WP	1,2 - Sp - ESu, showy	Plant dormant by early summer.
Hyacinth, Wild	<i>Camassia scilloides</i>	S, DP, MP, G	1,2 - Sp - ESu	
Illinois bundle flower	<i>Desmanthus illinoensis</i>	MP, WP, G	1,2 - LS - MSu	Legume
Indian paintbrush (A)	<i>Castilleja coccinea</i>	DP, MP, WP, G	1,2 - Sp - Su, showy	Can be summer seeding on poor sites with established grass
Indigo, Blue wild	<i>Baptisia australis</i>	S, DP, MP, WP, G	1,2 - Sp - ESu, showy	POL, legume
Indigo, Cream wild	<i>Baptisia bracteata</i>	S, DP, MP, G	1 - Sp - LS, showy	POL, legume
Indigo, White wild	<i>Baptisia alba</i>	S, DP, MP, WP, G	1,2 - LS - MSu, showy	POL, legume
Ironweed, Missouri	<i>Vernonia missurica</i>	MP, WP	2,3 - MSu - F	POL
Ironweed, Giant	<i>Vernonia gigantea</i>	S (Wet), WP	2,3 - MSu - EF	
Ironweed, Yellow	<i>Verbena alternifolia</i>	S, BF, WP	2,3 - LSu - MF	
Leadplant	<i>Amorpha canescens</i>	S, DP, MP, G	1,2 - LS - Su, showy	POL, legume, somewhat woody
Lespedeza , Slender	<i>Lespedeza virginica</i>	S, DP, MP, G	1,2,3 - LS - EF	Legume, food
Lespedeza hairy	<i>Lespedeza hirta</i>	S, DP, MP, G	2,3 - LSu - F	Legume, food
Lespedeza, Postrate	<i>Lespedeza procumbens</i>	DP, G	2,3 - LSu - MF	
Lespedeza, Roundhead	<i>Lespedeza capitata</i>	S, DP, MP, G	2,3 - MSu - F	Legume, food, bloom may be greenish/cream colored
Lespedeza, Violet	<i>Lespedeza violacea</i>	S	2,3 - MSu - MF	
Lousewort/Wood betony	<i>Pedicularis canadensis</i>	S, DP, MP, G	1 - LS	
Milkweed, Butterfly	<i>Asclepias tuberosa</i>	S, DP, MP, G	1,2 - LS - Su, showy	POL
Milkweed, Common	<i>Asclepias syriaca</i>	DP, MP, WP	1,2 - LS - LSu	
Milkweed, Marsh/Swamp	<i>Asclepias incarnata</i>	WP	3 - F, showy	POL, milky sap
Milkweed, Purple	<i>Asclepias purpurascens</i>	S, DP, MP	1,2 - LS - MSu, showy	POL, milky sap
Milkweed, Spider	<i>Asclepias viridis</i>	DP, MP	1,2 - LS - ESu	
Tall Green Milkweed	<i>Asclepias hirtella</i>	S, DP, MP, WP, G	2 - Su	
Milkweed, Whorled	<i>Asclepias verticillata</i>	S, DP, MP, G	1,2,3 - LS - EF	
Hairy Mountain Mint	<i>Pycnanthemum pilosum</i>	S, DP, MP, WP, G	MSu-F	POL, mint
Mountain mint, Virginia/Common	<i>Pycnanthemum virginianum</i>	WP	2 - Su	POL, mint
Mountain mint, Slender	<i>Pycnanthemum tenuifolium</i>	S, DP, MP, WP, G	1,2 - LS - Su	POL, Mint, spreads slowly



<u>Common Name</u>	<u>Scientific Name</u>	<u>Habitat Type *</u>	<u>Flower Information **</u>	<u>General Information ***</u>
New Jersey tea	<i>Ceanothus americanus</i>	S, DP, MP, G	1,2,3 - LS - F, showy	POL, Somewhat woody.
Obedient plant	<i>Physostegia virginiana</i>	S, MP, WP, G	2,3 - MSu - EF, showy	POL, Mint, spreads slowly
Pea, Partridge (A)	<i>Chamaecrista fasciculata</i>	S, DP, MP, G	2,3 - Su - F, showy	POL, legume, food
Pea, Sensitive	<i>Chamaecrista nictitans</i>	S	2,3 - MSu - EF	
Petunia, Wild	<i>Ruellia humilis</i>	DP, MP, G	1,2,3 - LS - EF	Short
Poppy mallow, Fringed	<i>Callirhoe digitata</i>	DP, MP	1,2 - MS - LSu, showy	Spindly plant, slender, leafless stems
Poppy mallow, Purple	<i>Callirhoe involucrata</i>	DP, G	1,2 - MS - MSu, showy	
Prairie cinquefoil	<i>Drymocallis arguta</i>	DP, MP, G	1,2 - LS - Su	
Prairie dock	<i>Silphium terebinthinaceum</i>	S, DP, MP, WP, G	2,3 - Su - F	POL
Prairie parsley	<i>Polytaenia nuttallii</i>	DP, MP, WP	1,2 - LS - ESu	
Primrose, Evening	<i>Oenothera biennis</i>	MP	2,3 - ESu - MF	
Primrose, Missouri	<i>Oenothera missouriensis</i>	DP, G	1,2 - LS - MSu, showy	POL
Quinine, Wild	<i>Parthenium integrifolium</i>	S, DP, MP, G	1,2 - LS - Su	
Rattlebox	<i>Crotalaria sagittalis</i>	DP, G	1,2,3 - LS - EF	
Rattlesnake master	<i>Eryngium yuccifolium</i>	S, DP, MP, G	2 - Su	POL, Unique plant
Rose, Pasture	<i>Rosa carolina</i>	DP, MP, S	1 - LS	
Rose, Prairie	<i>Rosa setigera</i>	MP	1 - Sp, showy	POL, food
Rosinweed	<i>Silphium integrifolium</i>	S, DP, MP, WP, G	2,3 - Su - F, showy	POL, food
Sage, Pitchers	<i>Salvia azurea</i>	DP, MP, G	2,3 - Su - F, showy	
Scurfy pea	<i>Pediomelum tenuiflorum</i>	DP, MP, WP, G	1,2 - LS - MSu	Legume, food
Seed box	<i>Ludwigia alternifolia</i>	WP	2 - ESu - LSu	
Senna, Maryland	<i>Senna marilandica</i>	S, MP, WP	2 - MSu - LSu	POL, legume, food
Sensitive briar	<i>Mimosa nuttalli</i>	S, DP, MP, G	1,2 - LS - Su, showy	Legume
Shooting star	<i>Dodecatheon meadia</i>	S, DP, G	1 - LS, showy	Plant goes dormant by July 1 st .
Skullcap, Downy	<i>Scutellaria incana</i>	S (S. MO), MP	2,3 - MSu - EF	
Snakeroot, Sampson's	<i>Orbexilum pedunculatum</i>	S, MP, WP	1,2 - LS - MSu	Legume
Spanish needles (A)	<i>Palafoxia callosa</i>	S, DP, G	2,3 - LSu - F, showy	Tolerates mowing/pruning.
Spiderwort, Ohio	<i>Tradescantia ohiensis</i>	S, DP, MP, WP	1,2,3 - LS - F, showy	POL
Spurge, Flowering	<i>Euphorbia corollata</i>	S, DP, MP, G	1,2,3 - LS - F	Milky sap
Sunflower, Ashy	<i>Helianthus mollis</i>	DP, MP, G	2,3 - MSu - F, showy	POL, food
Sunflower, Maximillian ¹	<i>Helianthus maximiliani</i>	DP, MP	2,3 - MSu - MF	POL, food
Sunflower, Ox-eye/false	<i>Heliopsis helianthoides</i>	S, DP, MP, G	1,2,3 - LS - F, showy	Food, blooms over a long period.
Sunflower, Sawtooth	<i>Helianthus grosseserratus</i>	DP, MP, WP, G	2,3 - MSu - F, showy	POL, food
Sunflower, Tickseed (A/B)	<i>Bidens aristosa</i>	MP	2 - MSu - LSu	
Sunflower, Western	<i>Helianthus occidentalis</i>	DP, MP, G	2,3 - MSu - F, showy	POL, food, good wildlife structure.
Sunflower, Willowleaf	<i>Helianthus salicifolius</i>	WP, MP, DP	3 - EF - MF	
Sunflower, Wingstem	<i>Verbesina helianthoides</i>	S, DP, MP	2,3 - LS - Su	
Sunflower, Woodland	<i>Helianthus strumosus</i>	S	2,3 - MSu - F	POL, food

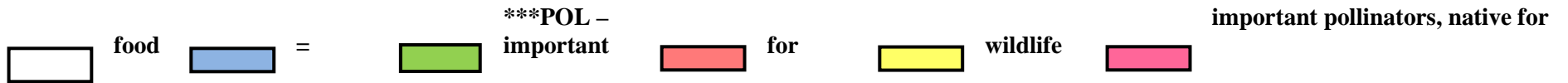


<u>Common Name</u>	<u>Scientific Name</u>	<u>Habitat Type *</u>	<u>Flower Information **</u>	<u>General Information ***</u>
Tick trefoil, Showy	<i>Desmodium canadense</i>	S, DP, MP, WP, G	2 - MSu - LSu, showy	Legume, food
Verbena, Rose	<i>Glandularia canadensis</i>	S, DP, G	1,2 - LS - LSu	
Vervain, Blue	<i>Verbena hastata</i>	WP	2,3 - ESu - MF	POL
Vervain, Hoary	<i>Verbena stricta</i>	DP, MP	1,2,3 - LS - EF	
Vetch, Canada milk	<i>Astragalus Canadensis</i>	MP	1,2 - LS - LSu	
White wingstem	<i>Verbesina virginica</i>	S, BF	2,3 - LSu - MF	
Yarrow	<i>Achillea millefolium</i>	DP, MP	1,2,3 - LS - F	

Under the “Common Name” column, A = Annual, B = Biennial, otherwise the plant is a perennial.

* S = Oak Savanna, DP = Dry Prairie, MP = Mesic Prairie, WP = Wet Prairie, G = Glade, BF = Bottomland Forest

**Blooming dates: In general, Sp = Spring (1) = April/May; LS = May; Su = Summer (2) = June—August; ESu = June; MSu = July; LSu = August; F = Fall (3) = September—early November; EF = September; MF = October; LF = late October—early November



White flowers blue/purple flowers green flowers red/orange flowers yellow flowers pink/violet flowers

¹Maximillian sunflower (*Helianthus maximiliani*) will only be used at a rate of less than 0.1 seeds per square foot.