

# Native Pollinators Job Sheet

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

<b>For:</b>	<b>County:</b>	
<b>Field(s):</b>	<b>Farm #:</b>	
<b>Date:</b>	<b>Tract #:</b>	<b>Acres:</b>
<b>Designed By:</b>	<b>Contact Information:</b>	

**PURPOSE:** To provide food, shelter, and nesting resources for pollinator species. This job sheet provides guidance on establishing and maintaining habitat to the primary benefit of animal pollinators.

**General Information:** If you mention the word pollinator, the average person immediately thinks of honey bees. Most people don't know that our common honey bee is actually an import from Europe, arriving on our shores in the 1600's. Fewer still know that the vast majority of Missouri's animal pollinators are native to the state, and that they represent an incredibly important resource for both native and introduced plants. Pollinators in Missouri include bees, butterflies, moths, wasps, flies, beetles, ants and even hummingbirds.

General guidance on lessening pollinator impacts are listed below by land use, along with specific techniques on how to improve habitat. Plantings for pollinators will be comprised of at least nine species, with a minimum of three species blooming in each season (spring, summer, and fall). See Table 1 for blooming periods.

**SPECIFICATIONS:**

**To establish pollinator foraging habitat:**

- ❑ Locate pollinator habitat where chemical drift will not be a concern.
- ❑ Avoid spraying herbicides or insecticides on field borders, filter strips, hedgerows and field windbreaks.
- ❑ Select undisturbed areas in full sun with good air circulation.
- ❑ Plant diverse herbaceous seeding mixes, giving preference to native species. Areas will be a minimum of 0.5 acre, but larger is better. Select the best site for habitat area on the least erosive portion of the field (narrow strips across the slope if possible); do not install pollinator habitat across areas of concentrated water flow. If planted in strips, plantings must have a minimum width of 20 feet – and a maximum width of 40 feet; with at least 2 times the planted width between strips.
- ❑ For native forbs/wildflowers, use at least 5.0# PLS/acre, a minimum of 9 species, with a minimum of three species blooming in each season (spring, summer, and fall), with no single species exceeding 15% or comprise less than 1% of the mix, and annuals/biennials (combined) will not exceed 10% of the mix. It is recommended that Missouri Source Identified Class seed is used for pollinator plantings. Refer to Upland Wildlife Habitat Management (645).



*Native bee on Black-eyed Susan*

- See Table 1 for blooming periods. Also refer to IS-MO643F Native Forb Information Sheet at [www.mo.nrcs.usda.gov/technical/forms](http://www.mo.nrcs.usda.gov/technical/forms).
  - When possible, manage existing native wildflowers and legumes by controlling undesirable vegetation. Refer to Table 1 or IS-MO643F Native Forb Information Sheet at [www.mo.nrcs.usda.gov/technical/forms](http://www.mo.nrcs.usda.gov/technical/forms).
- ❑ Two introduced legumes (alfalfa and annual lespedeza) are permitted and will not exceed 10% (if combined) of the total seeding rate. If 10% of the mix includes these introduced legumes (0.5 lbs PLS/acre), the amount of forbs and/or native legumes will be reduced to 4.5 lbs PLS/acre.
  - ❑ **Dormant seeding of forbs and native legumes is strongly recommended** (see IS-MO643 Forbs – Native Forb Information Sheet and Table 2 for establishment information).
  - ❑ When using the broadcast seeding method with a forb and legume seed mix, include a seed carrier (milorganite, pellet lime, rice hulls) and thoroughly mix the carrier with the seed to ensure a more even seed distribution.
  - ❑ Pollinator habitat establishment will follow the contours of the field as much as possible.
  - ❑ Avoid concentrated flow areas. It is recommended that pollinator plots planted in blocks should be a minimum of 100' apart from each other.
  - ❑ No fertilizer or soil amendments are required.



*Native bee foraging on purple coneflower*

#### **To establish pollinator nesting habitat:**

- ❑ Create woody structure by edge feathering or creating downed tree structures.
- ❑ Trees that are edge feathered must be adjacent to the pollinator planting and fall out onto the pollinator planting.
- ❑ Downed tree structures should be placed on the pollinator planting acreage.
- ❑ Woody material for pollinator nesting habitat will equal 1,500 square feet in size.
- ❑ Establish one 1,500 square foot area of woody material per 1 acre of pollinator planting, up to 1 acre in total woody habitat per 40 acres of pollinator plantings. Refer to Upland Wildlife Habitat Management (645).

#### **MAINTENANCE AND MANAGEMENT RECOMMENDATIONS:**

- ❑ Prescribed burning and **grass-only** herbicide application are the preferred management methods.
- ❑ Keep ground disturbance to a minimum, or disturb 50% or less of pollinator habitat annually.
- ❑ Manage prescribed burning to limit potential negative impacts on native insects—either by burning in the dormant season or by burning only a portion of the area (one-third to one-fourth) at any one time. Try to avoid growing season burns or whole field burns to reduce negative impacts on insect pollinators.

- ❑ Mowing is an inadequate means of disturbance for pollinator habitat, except as needed during establishment or to facilitate a management practice.
- ❑ Removal of competing vegetation is normally carried out for one growing season following establishment. Where applicable, mow as often as necessary during the first growing season to control competing vegetation. Competing vegetation should be cut to a height of 3-6 inches (or above the height of the native seedlings) whenever competing vegetation begins to completely shade the ground. Refer to Table 2 and IS-MO643 Forbs – Native Forb Information Sheet.

**PRIMARY HABITAT CONSIDERATIONS:**

- Implementing no-till farming to reduce disturbance of ground-nesting insects, especially for cropland adjacent to diverse herbaceous or woody cover.
- Reduce or eliminate the use of insecticides. If possible select pesticides that are less toxic to pollinators (for example, liquid forms are generally less toxic than granular powders, which are less noxious than dust) or break down quickly. Avoid microencapsulated formulations, since they mimic pollen. Choose ground applications over aerial spraying. Time spray operations very early or late in the day when pollinators are less active.
- Provide food and cover for native pollinating insects.
- Consult with NRCS or MDC natural resource managers for additional recommendations. Contact University Extension for additional information on wildlife management.

Comment:



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## REFERENCES:

The following publications were selected from a listing of documents from USDA's Natural Resources Conservation Service's website, and can be found at <http://plants.usda.gov/pollinators/NRCSdocuments.html>

[CSP Wildlife Enhancement Activity - Pollinator Areas](#) (PDF; 74 KB) - Conservation Security Program, Enhancement Activity Job Sheet (Alabama)

[Habitat Development for Pollinators NJ](#) (PDF; 102 KB) - Pollinator Conservation Biology Technical Note (New Jersey)

[Native Pollinators](#) (PDF; 4730 KB) - Fish and Wildlife Habitat Management Leaflet (U.S.)

[NRCS Pollinator Tech Note TEMPLATE - Xerces](#) (DOC; 647 KB) - Pollinator Conservation Biology Technical Note (U.S.)

[Pollinators South Dakota Fact Sheet SD-FS-55](#) (PDF; 72 KB) - Pollinator Conservation Biology Fact Sheet (South Dakota)

[Using Farm Bill Programs for Pollinator Conservation](#) (PDF; 278 KB) - Pollinator Conservation Biology Technical Note (U.S.)

Additional material can be found on NRCS's Plant Materials website at <http://www.plant-materials.nrcs.usda.gov/technical/pollinators.html>

Hilty, John. <http://www.flowervisitors.info/>, *Insect Visitors of Illinois Wildflowers*. Last updated March 25, 2009.

Robertson, Kenneth R. <http://www.inhs.uiuc.edu/~kenr/prairietable1.html>, *List of Native Prairie Plants for use Along Roadsides in Illinois*. Illinois Natural History Survey. Retrieved November 10, 2009.

Tallamy, Douglas W. <http://copland.udel.edu/~dtallamy/host/index.html>, *Lepidopteron Ornamental Guide*. Retrieved November 10, 2009.

Tallamy, Douglas W. *Bringing Nature Home: How Native plants Sustain Wildlife in Our Gardens*. TimberPress. Portland, Oregon. 2007.

Vaughn, Mace and Scott Hoffman Black, *Native Pollinators: How to Protect and Enhance Habitat for Native Bees*, *Native Plants Journal* 9(2):80-91, Summer, 2008.

Xerces Society. <http://www.xerces.org/pollinator-conservation/>. Pollinator Conservation website.

Table 1: Blooming periods of selected native forbs, tame legumes and woody plants.

<b>Spring flowering</b>	<b>Summer flowering</b>	<b>Fall flowering</b>
March – May	June – August	September – November
<b><i>Native Forbs:</i></b>		
Alum Root	Alum Root	
Meadow Anemone	Meadow Anemone	
Barbara’s button		
	Aster spp. **	Aster spp. **
Beardtongue spp. **	Beardtongue spp. **	
	Beggar tick (Bidens spp.) **	Beggar tick (Bidens spp.) **
	Beggar’s lice (Desmodium canadense & D. canescens)	Beggar’s lice (Desmodium canadense & D. canescens)
Bergamot (Monarda spp.) **	Bergamot (Monarda spp.) **	Bergamot (Monarda spp.) **
	Black-eyed Susan	Black-eyed Susan
	Blazing star spp. **	Blazing star spp. **
	Blue lobelia **	Blue lobelia **
	Boneset **	Boneset **
	Brown-eyed Susan	Brown-eyed Susan
	Cardinal flower **	Cardinal flower **
Catchfly, Royal	Royal catchfly	Royal catchfly
Clovers, Prairie **	Clovers, Prairie **	
Compass plant **	Compass plant **	
Coneflower, Grayhead, Purple & Upright **	Coneflower, Grayhead, Purple & Upright **	Coneflower, Grayhead, Purple & Upright **
Coneflower, Pale purple, Yellow & Ozark Glade **	Coneflower, Pale purple, Yellow & Ozark Glade **	
	Coneflower, Sweet **	
Coreopsis spp.	Coreopsis spp.	
	Culver’s root **	
	Cup plant **	Cup plant **
	Curly cup gum plant	Curly cup gum plant
Blue flag	Blue flag	
Copper flag **		
Goat’s rue **	Goat’s rue **	
Golden Alexander	Golden Alexander	
	Goldenrod spp. **	Goldenrod spp. **
	Gravelweed (Verbesina helianthoides) **	Gravelweed (Verbesina helianthoides) **
Illinois bundle flower	Illinois bundle flower	
Indian paintbrush **	Indian paintbrush **	
Indigo, white & blue **	Indigo, white & blue **	
Indigo, cream **		
	Ironweed **	Ironweed **
Leadplant **	Leadplant **	
	Lespedeza sp.	Lespedeza sp.
Lousewort **		
Milkweed, butterfly & purple **	Milkweed, butterfly & purple **	
		Milkweed, marsh **
	Mountain mint **	
Mountain mint, slender **	Mountain mint, slender **	
New Jersey tea **	New Jersey tea **	New Jersey tea **
	Obedient plant **	Obedient plant **

Table 1, continued

<b>Spring flowering</b>	<b>Summer flowering</b>	<b>Fall flowering</b>
March – May	June – August	September – November
	Partridge pea **	Partridge pea **
Petunia, wild	Petunia, wild	Petunia, wild
Poppy mallow sp.	Poppy mallow sp.	
Prairie cinquefoil **	Prairie cinquefoil **	
	Prairie dock **	Prairie dock **
Prairie hyacinth **	Prairie hyacinth **	
Prairie parsley	Prairie parsley	
Primrose, MO evening **	Primrose, MO evening **	
Quinine	Quinine	
Rattlebox	Rattlebox	Rattlebox
	Rattlesnake master **	
Rose, prairie **		
	Rosinweed **	Rosinweed **
Sage, pitchers/blue **	Sage, pitchers/blue **	Sage, pitchers/blue **
Scurfy pea	Scurfy pea	
	Maryland senna **	
Sensitive briar	Sensitive briar	
Shooting star		
Snakeroot, Sampson's	Snakeroot, Sampson's	
	Spanish needles	Spanish needles
Spiderwort, Ohio **	Spiderwort, Ohio **	Spiderwort, Ohio **
	Sunflowers, Helianthus spp. **	Sunflowers, Helianthus spp. **
Sunflower, Oxeye/false **	Sunflower, Oxeye/false **	
	Tick trefoil, showy	Tick trefoil, showy
	Vervain, blue **	Vervain, blue **
	White crownbeard (Verbesina virginica) **	White crownbeard (Verbesina virginica) **
<b><u>Tame Legumes:</u></b>		
Alfalfa **	Alfalfa **	Alfalfa **
	Korean/Kobe/Common lespedeza	Korean/Kobe/Common lespedeza

Blooming period information came from Native Forb Information Sheet (*IS-MO643F*). For species not covered in this table use the above references.

Any entry, such as Aster spp., implies that all of the species for that group bloom during the periods indicated. For sunflowers, the group is broken down by genus name—all species of the genus *Helianthus* bloom at the same period. Other plants with sunflower in the name but having a different genus, may bloom at different periods.

Plants denoted with \*\* have been designated as especially attractive for pollinators by the Xerces Society.

For purposes of the CSP pollinator enhancement and CRP pollinator plantings, any species having multiple blooming periods only counts as one species. For example, bergamot blooms during all three blooming periods, but would only count once—assign it to the blooming period needed. A total of 9 species—3 early, 3 mid, and 3 late blooming—are needed to meet the enhancement criteria.

**Table 2. Options for controlling competing vegetation during forb establishment.**

Option	Current Cover	Timing	Method(s)
Single herbicide application	Cropland OR Sparse Grassland	Fall	<p>(This option should not be used when tall fescue or brome is the dominant cover. Two herbicide applications are needed to adequately control these species. Heavy stands of red or ladino clover will also require two treatments)</p> <ol style="list-style-type: none"> <li>For sparse grassland, remove excess vegetation prior to spraying, preferably in late summer or fall (Aug./Sept.) to allow regrowth. Mowing/haying or prescribed burning are the preferred options.</li> <li>Apply herbicide (follow all label instructions) on new growth when it is 4-6 inches in height and actively growing. <ul style="list-style-type: none"> <li>-apply 1.5 quarts of glyphosate. This may be tank mixed with imazapic, but be sure that forbs to be planted are tolerant according to the product label. Spray while undesirable vegetation is actively growing.</li> <li>-for cropland, spray winter annuals prior to March 15<sup>th</sup> in south Missouri, April 1<sup>st</sup> in north Missouri, but prior to native forb seedling emergence.</li> </ul> </li> </ol>
Two herbicide applications	Non-desirable grassland	Fall and Spring	<p><b>Option 1</b>  Step 1. Remove excess vegetation in early spring (March).  Step 2. Apply 1 to 2 quarts herbicide (glyphosate, follow all label instructions) on new growth when it is 4-6 inches in height and actively growing.</p> <p><b>AND</b>  Step 3. Apply herbicide (1.5 quarts of glyphosate, follow all label instructions) in fall (Sept.—Oct.) when grass is actively growing. <ul style="list-style-type: none"> <li>Subsequent applications of glyphosate or a grass-specific herbicide may be necessary in future years to knock back invading undesirable cool-season grasses, see footnotes below for more information.</li> </ul> Step 4. Dormant seed native forbs and grasses.</p> <p><b>Option 2</b>  Step 1. Begin with a fall glyphosate application (1.5 quarts of glyphosate, follow all label instructions), prior to November 1.  Step 2. Then dormant seed native forbs.  Step 3. A follow-up herbicide application is required, preferably in either spring with a grass-specific herbicide before April 15 (follow all label instructions) or a fall application of glyphosate after the native plants go dormant.</p> <p><b>Option 3</b>  Step 1. Consider glyphosate-tolerant soybeans or forage sorghum for a year or two to eliminate undesirable vegetation.  Step 2. Then dormant seed native forbs and grasses.</p>
Prescribed burn or disking	Desirable native grass	Late Summer or Fall	<ol style="list-style-type: none"> <li>Burn in September—October to suppress existing grass. If there is an abundance of litter present, either burn or disk to expose bare ground prior to seeding (the seedbed must have at least 50 percent bare ground).</li> <li>If there is an abundance of undesirable cool-season grass present (such as fescue), wait until the native grass has gone dormant (usually after the first killing frost) and then spray as outlined above for Cropland or Sparse Grassland.</li> <li>Burning is the preferred option, and forbs may be broadcast during the dormant season by seeding directly onto the remaining ash.</li> </ol>
Prescribed burn or disking	Rank stands of native grass	Late Summer	<ol style="list-style-type: none"> <li>Prescribed burning in late summer (August—September, earlier the better) can be used alone or in conjunction with mowing/haying or disking provided, enough fuel remains to conduct a hot burn and set back the grass (the seedbed must have at least 50 percent bare ground). Continue frequent mowing throughout the 1<sup>st</sup> growing season following seeding.</li> </ol>

## **Table 2. Options for controlling competing, non-desirable vegetation during forb establishment.**

Contact your local University of Missouri Extension office, or local herbicide dealer for recommendations on type of herbicide and rates for your specific situation. NRCS does not endorse any particular herbicide product. Be sure and follow all label directions. Take care that the timing of the use of a contact herbicide, such as a glyphosate, occurs after desirable plants are dormant in the fall, or prior to their beginning growth in the spring. Remember that native cool season grasses (such as wildrye) and some forbs (such as beardtongue) may not go dormant. In general, spraying to control undesirable cool-season grasses should take place before October 31.

Note that an adequate seedbed for native forb establishment will have at least 50 percent bare ground. Prescribed burning is the preferred method for seedbed preparation when establishing forbs into an existing grass stand. **Dormant seeding of forbs and native legumes is strongly recommended.**

**Mowing for weed control the establishment year is important**, especially for forbs established into existing grass. Research has shown repeated mowing in the establishment year results in better forb establishment and persistence in existing native grass.

When using glyphosate or grass-specific herbicides (sethoxydim, quizalofop p-ethyl, or clethodim) timing is critical. Glyphosate is a contact killer, and its use may harm or kill desirable forbs. Timing should be late fall/early winter after natives have gone dormant. Spray during warm days (50-60 degrees) with low label rates. Use of grass-specific herbicides should be timed in early spring prior to native grass breaking dormancy.