Native Pollinators
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 #:**	**Acres:**
Designed By:	**Contact Information:**	

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.

Techniques to improve habitat for pollinators are listed below by land use. 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. For native forbs/wildflowers, use at least 5.0# PLS/acre, a minimum of 9 - 15 species, with no single species exceeding 10% of the stand, and annuals/biennials limited to no more than 10% of the total amount planted. Follow grass seeding guidance in the Upland Wildlife Habitat Management (645) standard. Refer to Vegetation Establishment, Herbaceous Seeding (723) specification for site preparation and seeding date details.

Tree/shrub plantings will be of native species, comprised of nine flowering species, and total at least 0.5 acres in size. Follow planting guidance in the Tree/Shrub Establishment (612) standard for details on planting rates and spacings.

Note that certain USDA programs may have specific criteria. Select those options that you wish to establish/implement on your property by checking the appropriate box(es)::

SPECIFICATIONS:

Cropland:

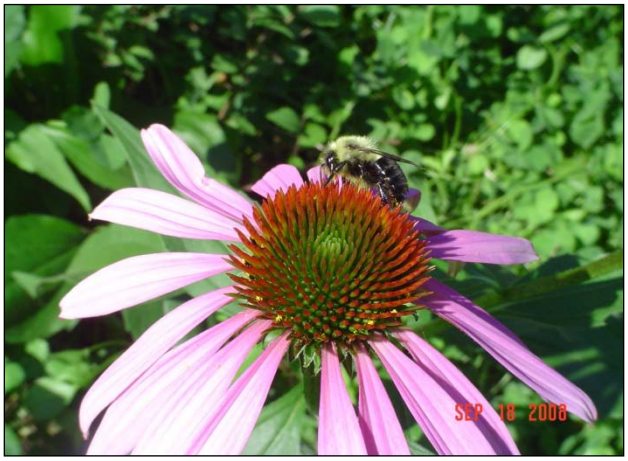
- ☐ Implement no-till farming to reduce disturbance of ground-nesting insects, especially for cropland adjacent to diverse herbaceous or woody cover.
- ☐ Establish field borders, and/or contour grass strips of diverse herbaceous plant mixtures, minimum width of 30 feet and total size of at least 0.5 acre.
- ☐ Establish/manage windbreaks, shelterbelts, or other woody plantings of native tree/shrub species, minimum width of 30 feet, total size of 0.5 acre per 40 acres of cropland. These plantings may be in blocks less than 0.5 acres (minimum size 1500 sq. ft.), but must total 0.5 acres within each 40 acres.

Native bee on Black-eyed Susan

- [ ] Consider these techniques to reduce or eliminate 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; ground applications are less damaging than aerial spraying; spray very early or late in the day when pollinators are less active.
- [ ] 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.

Grassland:

- [ ] Plant diverse herbaceous seeding mixes, giving preference to native species. Areas will be a minimum of 0.5 acre in size and 30 feet wide, but larger is better. For native forbs/wildflowers, use at least 5.0# PLS/acre, a minimum of 9 - 15 species, with no single species exceeding 10% of the stand, and annuals/biennials limited to no more than 10% of the total amount planted.
    - See Table 1 for blooming periods. Also refer to IS-MO643F Native Forb Information Sheet at 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
- [ ] Tame legumes may be a part of a pollinator planting, but will not be included as a component of a mixture including native forbs (except for alfalfa and lespedeza). To maximize pollinator values, tame legumes may be coupled with woody plantings to provide at least nine species. Preferably a minimum of three flowering species should be included for each season (spring, summer and fall). See Table 1 for blooming periods.



Native bee foraging on purple coneflower

- [ ] Implement a rotational grazing system with a minimum of eight paddocks, to ensure plant diversity. Follow NRCS prescribed grazing guidelines for grazing and rest periods. In addition the plants must be given adequate time, in their season, for flowering; this typically requires a rest period of not less than 40-45 days. Field verification will be necessary to ensure the presence of adequate pollinator plants, preferably with a minimum of three flowering species for each season (spring, summer and fall).
- [ ] Implement patch burn/grazing to increase plant diversity.
- [ ] 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.
- [ ] Avoid mowing during the flowering period. If possible mow no more than one-third of the overall area in a single season.
- [ ] Select undisturbed areas in full sun with good air circulation to establish pollinator habitat.

Woodland:

- [ ] If implementing Forest Stand Improvement (FSI), thinning will be at least to the 60% stocking level, using girdling, frilling or hack and squirt methods to ensure standing dead trees. Thinning operations will select to maintain a diversity of tree/shrub species. (Refer to IS-MO666cut Controlling Undesirable Trees and Shrubs for guidance on these techniques.)
- [ ] Tree/shrub plantings will be of native species, comprised of nine flowering species, and total at least 0.5 acres in size. Preferably a minimum of three flowering species should be included for each season

(spring, summer and fall). Shrub species must include at least one of the following: plum, elderberry, blackberry, prairie willow, choke cherry, false indigo, or a shrub dogwood. See Table 1 for blooming periods. Follow planting guidance in Tree/Shrub Establishment (612) standard for details on planting rates and spacings. Herbaceous plantings can be used to count toward the species requirement.

☐ Livestock will be excluded to reduce stress on woody plants and encourage development of an herbaceous layer.

Water:

☐ Insect pollinators utilize surface water. Consider adding wildlife watering facilities (refer to JS-BIOL-28 Wildlife Watering Facility job sheet) near pollinator areas if it is located more than one-quarter mile from a dependable water source.

Forest stand improvement, showing girdled trees left to provide nesting areas.

MAINTENANCE:

☐ Keep ground disturbance to a minimum, or disturb 50% or less of pollinator habitat annually.

☐ Carefully plan the use of prescribed fire or grazing/haying/mowing operations to reduce negative impacts on insect pollinators.

PRIMARY HABITAT CONSIDERATIONS:

- 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.

Spring flowering March – May	Summer flowering June – August	Fall flowering September – November
Native Forbs:		
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

Spring flowering March – May	Summer flowering June – August	Fall flowering 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) **
Tame Legumes:		
Red/alsike Clover **		
Ladino clover **	Ladino clover **	Ladino clover **
Alfalfa **	Alfalfa **	Alfalfa **
	Korean/Kobe/Common lespedeza	Korean/Kobe/Common lespedeza
Woody plants:		
Apple spp. **		
Ash, Wafer (Ptelea trifoliate)	Ash, Wafer (Ptelea trifoliate)	
Azalea **		
	Basswood **	
Black cherry **		
Brambles—Blackberry/ Raspberry/Dewberry **	Brambles—Blackberry/ Raspberry/Dewberry **	
Black walnut		
Catalpa (Catalpa speciosa) **	Catalpa (Catalpa speciosa) **	
Cherry spp. **		
	Clematis	Clematis
Crab apple spp. **		
Dogwood spp. **	Dogwood spp. **	
Elderberry	Elderberry	
False indigo	False indigo	
Hawthorn spp. **		

Table 1, continued

Spring flowering March – May	Summer flowering June – August	Fall flowering September – November
Hickory spp.		
Oak spp.		
Peach **		
Pear (not ornamental varieties)**		
Paw paw		
Persimmon	Persimmon	
Plum spp. **		
Redcedar		
Red maple **		
Service berry **		
Silver maple **		
	St. John's-wort **	St. John's-wort **
Sumac spp.	Sumac spp.	
Sugar maple **		
Tulip poplar **	Tulip poplar **	
Viburnum spp.	Viburnum spp.	
	Virginia creeper	
	Wild hydrangea	
Wahoo (Euonymus)	Wahoo (Euonymus)	
Willow spp. **		
Witch hazel, Ozark		Witch hazel, Eastern
	Woolly buckthorn	

Blooming period information came from Native Forb Information Sheet *(IS-MO643F)*. Blooming information for woody plants came from *Trees of Missouri* and *Shrubs and Woody Vines of Missouri*, by Don Kurtz. 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, 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.