



Native Habitat Development for Pollinators, Honey Bees and Monarchs (327) ***Biology Jobsheet #16***

Natural Resources Conservation Service (NRCS) – Minnesota

November 2018

Landowner: _____

Definition

Restoring and conserving native plant communities to benefit pollinators, honey bees and associated wildlife species.



Where Used

On landscapes which once supported the habitat to be restored and managed, including land retired from agricultural production entered in retirement programs.

Specifications

To attract pollinators, an area must have adequate sources of food, shelter and nesting sites. A variety of wildflowers and grasses will provide pollinators with food (nectar, pollen, and /or larval host plants). Blooming shrubs are an especially important source of pollen and nectar for pollinators, usually blooming well before many forb species.

Minimum width shall be 20'. A pesticide application setback of at least 30' from the edge of the planting into the adjacent cropland is required on all planting configurations. Establish and/or manage sites >1/2 ac. in size that contain a diversity of native grasses, wildflowers, and 1-2 rows of shrubs (optional).

Plantings shall contain:

- A minimum of nine species of pollinator friendly native forbs – additional forbs are encouraged.
- At least three species shall be from each bloom period – early, mid and late flowering season so that pollinators have continuous food sources.
- A minimum of two native bunch grasses to provide nest sites.
- *Mixtures designed to benefit monarch butterflies shall include nectar and larval plants beneficial to the Monarch butterfly. To provide food for monarch butterfly larvae, plantings shall include at least one species of milkweed (Asclepias spp.). Milkweed species shall comprise at least 1.5% of the total mixture (grass and forbs) based on seeds/ft². To provide food for adult Monarchs, at least 60% of the forb seeds in the mix shall be from the monarch butterfly planting list in Table 1.*
- The mixture will result in 35-40 seeds/ft². Forbs will comprise 75% - 80% of the mixture based on seeds/ft². See Table 1 for recommended species and MN Agronomy Technical Note #31 for design specifications.
[Agronomy Technical Notes | NRCS Minnesota.](#)
[Seeding Tools | NRCS Minnesota](#)

Grass/Forb Establishment

Site Preparation - Site preparation, which includes perennial weed abatement and seedbed creation, is crucial for successful native plantings. The key points are to remove *all* perennial weeds through herbicide use, smothering or another weed abatement method, and to prepare a firm seedbed that will ensure good seed-to-soil contact.

Land that has been in grass for many years usually has a thick residue layer on the soil surface. To allow for the best planting success, as much of this residue as possible must be removed. Three options are (1) grazing; (2) mowing with residue removed, and (3) prescribed burn. After most of the residue is removed, use of a broad-spectrum herbicide is usually essential in order to kill remaining vegetation (especially all aggressive perennial weeds such as smooth brome and Canada thistle). For organic farms, the use of smother crops or solarization with plastic may provide acceptable site preparation.

Cultivation of the planting area is likely to raise dormant weed seed from deeper in the soil profile, causing it to germinate. Therefore cultivation should be avoided as a site preparation method. The prepared seedbed should be relatively smooth, with some visible bare ground to ensure good seed-soil contact.

Two planting methods are described below. Dormant season seeding (fall or frost seeding) is recommended. Fall dormant seeding favors forbs due to cold, moist stratification. Fall dormant seeding is recommended unless the forb seed has been pre-stratified before purchase.

No-Till Planting - If possible, use specialized no-till native grass drills for seeding pollinator habitat. Such drills have depth bands designed to handle a wide variety of seed (fluffy, smooth, large, and small) and low seeding rates. Since no-till drilling can plant directly into a light stubble layer, this method reduces erosion on the newly seeded site. Conventional grain drills are not capable of handling diverse seed sizes and are unlikely to provide satisfactory results.

While these no-till native seed drills can plant through light stubble, success is still likely to be greatest when most excess residue (heavy thatch) is removed. Similarly, cultipacking the ground prior to planting will help smooth the seedbed and may improve germination. Do not harrow or till the soil prior to planting, as heavy drills tend to sink in loose soil and depth control is difficult.

Plant seed around one-quarter inch deep. Some seed may be seen on the surface of the ground after seeding. Cultipack the planting area again after seeding if possible.

Broadcast Planting - Prepare a fine firm seedbed to a depth of 3 inches. Use a roller, cultipacker or similar implement prior to seeding. The seedbed should contain enough fine soil particles for uniform shallow coverage of the seed as well as creating direct contact with moisture and nutrients. Broadcast seed at a rate of 1.5 times the normal drill seeding rate. Harrow lightly with a chain link fence (not a heavy spike tooth harrow) to smooth the ground and cover the seed, and roll or cultipack the area again to pack the seed in place.

Post Planting - During the establishment year, mow annual weeds after they have reached 12" in height. Mow 2 to 3 times, generally on 30 day intervals from the date of seeding, or as often as needed to prevent weeds from flowering. Mow to a 6-8 inch height. Use a rotary mower or remove the clippings so as not to smother the seedlings. This will slow the weeds but won't harm the prairie plants.

The second year, evaluate the stand to determine if weed control is necessary. If it is, spot mow weeds at a height of six inches. If there is enough material for a prescribed burn, this may be an effective method of control.

Use of Pesticides - Consider prior crop history. Sites with historic intensive row cropping utilizing insecticide treated seed, may benefit from a year of temporary cover to minimize negative impacts from insecticide or herbicide carryover. **Enter herbicide history for previous two years below (most recent crop year first):**

Operation and Maintenance

1. Prevent unmanaged vegetative disturbance.
2. After the seeding is established control all noxious weeds as identified by state and local laws, by: (a) spot treating with chemicals per label directions, or (b) spot mow before seed heads form.
3. Manage grasses and forbs periodically to rejuvenate grass quality and vigor. Management should occur within 3-5 years of adequate vegetative establishment. Mechanical management activities should take place prior to May 15 or after October 1 to protect late flowering plants. No more than 1/3 of the field should be manipulated in a given year.
4. Prescribed fire is the preferred management technique. Fall (October - Early November) burns tend to favor wildflowers.
5. Prevent animal damage by browsing mammals. Replace dead trees and shrubs as necessary.

TABLE 1: RECOMMENDED GRASS, FORB AND SHRUB SPECIES		Bloom Color	Honey Bee	Monarch	Flowering Season Early = April – June Mid = June – August Late = August – October
DRY to MESIC					
<i>Butterfly Weed</i>	Asclepias tuberosa	Orange	x	LH	Mid
Canada Milkvetch	Astragalus canadensis	Cream	x		Mid
Culvers Root	Veronicastrum virginicum	White	x	H	Mid
Compass Plant	Silphium laciniatum	Yellow		H	Mid
Dotted Blazingstar	Liatris punctata	Rose		H	Mid
Evening Primrose	Oenothera biennis	Yellow			Mid
Ground Plum	Astragalus crassicaucus	Purple	x		Early
Hoary Vervain	Verbena stricta	Blue	x	H	Mid
Ironweed	Veronia fasciculata	Purple	x	H	Mid
Lance-leaved Coreopsis	Coreopsis lanceolata	Yellow	x	H	Early
Leadplant	Amorpha canescens	Purple	x	H	Mid
Long-headed Coneflower	Ratibida columnifera	Yellow			Mid
Ontario Blazingstar	Liatris cylindracea	Purple	x	H	Late
Purple Coneflower, Narrow	Echinacea angustifolia	Pink	x	H	Mid
Purple Coneflower - Eastern	Echinacea purpurea	Pink	x	VH	Early
Rough Blazingstar	Liatris aspera	Purple	x	VH	Late
Showy Goldenrod	Solidago speciosa	Yellow	x	VH	Late
Large-flowered Penstemon	Penstemon grandiflorus	Lavender	x		Early
Silky Aster	Symphotrichum sericeum	Purple			Late
Skyblue Aster	Symphotrichum oolentangiense	Blue	x	H	Late
Smooth Aster	Symphotrichum laeva	Blue	x	H	Late
Spotted Beebalm	Monarda punctata	Lavender	x	H	Mid
Stiff Sunflower	Helianthus paucifloris	Yellow		H	Mid
Stiff Tickseed	Coreopsis palmata	Yellow		H	Mid
Wild Blue Phlox	Phlox divaricata	Blue	x	H	Early
Wild Columbine	Aquilegia canadensis	Red	x		Early
Wild Lupine	Lupinus perennis	Lavender			Early
Wild White Indigo	Baptisia alba	White			Early
<i>Whorled Milkweed</i>	Asclepias verticillata	White		LH	Mid - Late
MESIC to WET MESIC					
Blue Vervain	Verbena hastata	Blue			Mid
Bottle Gentian	Gentiana andrewsii	Blue			Late
Canada Tick Trefoil	Desmodium canadense	Purple	x		Mid
Common Oxeye	Heliopsis helianthoides	Yellow		H	Mid
Foxglove beardtongue	Penstemon digitalis	White	x		Early
Giant Sunflower	Helianthus giganteus	Yellow	x	H	Late
Golden Alexanders	Zizia aurea	Yellow			Early
Great Blue Lobelia	Lobelia siphilitica	Blue		H	Late
Ironweed	Veronia fasciculata	Purple	x	H	Late
Meadow Blazingstar	Liatris lingulistylis	Purple		VH	Late
Mountain Mint	Pycnanthemum virginianum	White	xx		Mid
Partridge Pea	Chamaecrista fasciculata	Yellow	x		Mid
Rattlesnake Master	Eryngium yuccifolium	White		H	Mid
Sawtooth Sunflower	Helianthus grosseserratus	Yellow		VH	Late
Tall Blazingstar	Liatris pycnostachya	Purple		H	Mid
Virginia Bluebells	Mertensia virginica	Blue	x	H	Early
Wild Bergamot	Monarda fistulosa	Lavender		VH	Mid
Yellow Coneflower	Ratibida pinnata	Yellow			Mid

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WET					
Boneset	<i>Eupatorium perfoliatum</i>	White	x	H	Late
Cup Plant	<i>Silphium perfoliatum</i>	Yellow	x	H	Mid
Joe-pye Weed	<i>Eupatorium maculatum</i>	Rose	x	VH	Mid
New England Aster	<i>Symphotrichum novae-angliae</i>	Purple	x	VH	Late
Panicled Aster	<i>Symphotrichum lanceolatum</i>	White	x		Late
Sneezeweed	<i>Helenium autumnale</i>	Yellow	xx		Late
<i>Swamp Milkweed</i>	<i>Asclepias incarnata</i>	Red	x	LH	Mid
Wingstem	<i>Verbesina alternifolia</i>	Yellow	x		Mid

DRY to WET MESIC					
Anise Hyssop	<i>Agastache foeniculum</i>	Purple	x		Mid
Black-eyed Susan	<i>Rudbeckia hirta</i>	Yellow		H	Late
<i>Common Milkweed</i>	<i>Asclepias syriaca</i>	Purple	x	LH	Mid
Cream Gentian	<i>Gentiana flavida</i>	Cream			Late
Grass-leaved Goldenrod	<i>Euthamia graminifolia</i>	Yellow	x	H	Mid
Purple Prairie Clover	<i>Dalea purpurea</i>	Purple	xx		Mid
Maximillian Sunflower	<i>Helianthus maximiliani</i>	Yellow	x	H	Late
Spiderworts	<i>Tradescantia</i> spp.	Blue			Early
Stiff Goldenrod	<i>Solidago rigida</i>	Yellow	x	VH	Late
White Prairie Clover	<i>Dalea candida</i>	White	x	H	Mid
Yellow Giant Hyssop	<i>Agastache nepetoides</i>	Cream	x	H	Late

XX = Highest value honey bees

Monarch larval host = LH Monarch nectar value = Very High, High

RECOMMENDED WOODY SPECIES		Value to Pollinators 1/	Flowering Season
American Plum	<i>Prunus americana</i>	G	Early
Button Bush	<i>Cephalanthus occidentalis</i>	EX	Mid
Chokecherry	<i>Prunus virginiana</i>	EX	Early
Common Ninebark	<i>Physocarpus opulifolius</i>	EX	Early
Dogwoods	<i>Cornus</i> spp.	G	Early
False Indigo	<i>Amorpha fruticosa</i>	EX	Mid
Fragrant False Indigo	<i>Amorpha nana</i>	EX	Mid
New Jersey Tea	<i>Ceanothus americanus</i>	EX	Mid
Native Rose Species	<i>Rosa</i> spp.	EX	Mid
Saskatoon Serviceberry	<i>Amelanchier alnifolia</i>	EX	Early
Willow, Pussy or Black	<i>Salix</i> spp.	EX	Early

1/ G = Good EX = Excellent

RECOMMENDED GRASSES

	Percentage of Grass Mixture
Big Bluestem or Indiangrass	0-25%
Little Bluestem	0-50%
Prairie Dropseed	0-50%
Sideoats Grama	0-25%
Wildrye (Canada or Virginia)	0-20%

Native Habitat Development For Pollinators– Native Shrub Planting Specifications Sheet
 See practice standard 380-Windbreak/Shelterbelt Establishment for site prep and planting specifications.

An aerial view, or if needed an aerial photo of the area to be planted to native trees and shrubs can be shown below. Other relevant information, such as complementary practices, and adjacent field or tract conditions including structures and crop type, and additional specifications may be included.

Row No.	Row Length	Species	Spacing		Number of trees	
			In Row	Between Row	Planned	Planted

Scheduled Planting Date: _____

Site Prep: _____

Application
 Planting Stock _____

Source _____

Condition _____

Planted by: _____

Date Planted: _____

Feet: _____ Acres: _____

Field Conditions: _____

Maintenance Required

Practice Specifications Approval and Completion Certification

NRCS Review Only

DESIGN INSTALLATION AND LAYOUT APPROVAL:

Designed By:	Date:	Job Approval Authority (JAA):
Approved By:	Date:	Job Approval Authority (JAA):

RECORD OF COMPLETION AND CHECK OUT CERTIFICATION:

Treated Acres:	Date Completed by Client:	Date Certified:

Certification Statement:

I certify that implementation of this conservation practice is complete, meets criteria for the stated purpose(s), and meets the NRCS conservation practice standard and specifications.

NRCS Signature:	Date:	Job Approval Authority (JAA):