



Pollinator Habitat

Each year native and domesticated bees pollinate around 30% of crops in the United States with a value of approximately \$23 billion. They also pollinate around 70-80 percent of flowering plants in the Midwest, playing a key role in their seed production. Native bee populations that include more than 4,000 species in North America have declined in recent years due to habitat loss and pesticides use among other factors. At the same time, managed colonies of European honey bees have suffered a 50% decline in recent decades.

While Honey Bees and Bumble Bees are the most commonly known pollinators, they only make up about 2% of bee species in Minnesota. The remaining species are solitary bees that do not live in colony systems like Honey or Bumble bees (with division of labor and cooperative rearing of young). Supporting native solitary bee habitat is important, as like honey bees, their populations are also in decline. Pay attention to the various pollinators and their habitat needs in the landscape to help protect and enhance their existing habitat.

Other pollinators of concern include beetles such as the Longhorned beetle, flies such as the Syrphid fly, moths and butterflies. Many of these pollinators have their own unique habits and needs, for example, many moths tend to pollinate white or dull colored blossoms that flower at night. Some plant species are dependent on others for the completion of their lifecycle, such as the Monarch butterflies dependence on milkweed, and the endangered Karner Blue butterflies need for Wild Lupine. By establishing native vegetation, one can support the intricate relationships forged between native pollinators and native vegetation that keep both populations healthy.

Site Selection

Adequate food, shelter, and nesting sites are all needed to support healthy pollinator populations. The following are key considerations for selecting areas for pollinators:

- 1) Look for areas away from pesticide and fungicide use, as well as areas that lack widespread disturbances that may impact pollinators.
- 2) Habitat complexes and corridors provide "safe zones" and natural passageways for pollinators, as well as nesting and forage sites, and sources of water.
- 3) Some bees have a relatively small flight distance and benefit from having water and food sources within 200 feet of nesting sites.



Habitat complexes and corridors are important nesting and food sources for pollinators



Bees pollinating marsh Milkweed.



A mason bee home made by drilling holes into layered 2 x 4s.

4) Ground nesting bees benefit from planting clump forming native grasses. Bees that nest in tree and stem cavities benefit from farm hedgerows, windbreaks and treelines, as well as man-made nest structures.

Achieving High Function

Seed mixes for pollinators should include at least fifteen species and have a high percentage of forbs (30-60% by seed count). Grasses are also important for community structure, nesting sites and to provide fuel for prescribed burning. Shorter grasses can benefit forb growth and pollinator use. It is recommended to include at least three flowering species in each bloom period so there is a continuous food source throughout the season (few early blooming species are typically included in mixes). It is also helpful to plant forbs in masses to make them easier for pollinators to find and to increase foraging efficiency. Including a wide range of flower colors and shapes will benefit a variety of pollinator species. In addition to herbaceous plants, flowering trees and shrubs can be an important source of pollen and nectar for pollinators, particularly early in the spring. Avoid clearing fallen or dead trees, as they help create nesting sites for a wide range of pollinators.

Key Plant Species

Plant species can be selected for projects to support specific insects, such as planting milkweed species for monarchs (and a variety of pollinators), lupine for Karner Blue Butterfly, or basswood for a variety of bee species. The following are key pollen and nectar sources for pollinators in the spring, summer and fall. Species should be selected that are native to the area and well adapted to site conditions.

Spring:	Willows, Basswood, Dogwoods, Viburnums, Juneberries, Plums, Cherries, Blueberry, Lupine, Bloodroot, Buttercups, Dutchman’s breeches, Columbine, Virginia bluebells, Spiderwort, Lobelias, Golden alexanders
Summer:	Buttonbush, Dogwoods, False indigo, New Jersey tea, Wild rose, Prairie clovers, Milkweed, Wild bergamot, Giant hyssop, Penstemons, Bush clovers, Canada milkvetch, Culver’s root, Hedge nettle, Evening primrose, Ironweed, Leadplant, Coreopsis, Canada tick trefoil, Lobelias, Obedient plant, Mountain mint, Partridge pea, Yellow coneflower, Cup plant, Joe-pye weed and Blazing stars.
Fall:	Asters, Sneezeweed, Grass-leaved goldenrod, Gentian, Boneset, Goldenrods, Sunflowers



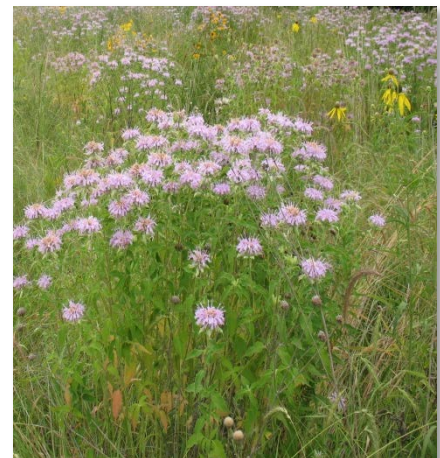
A native bee collecting nectar from an Obedient plant.

Source Recommendations

Local seed and plant sources are recommended for pollinator habitat projects to protect nearby native prairie populations and to provide plant species that are compatible with local insect populations. It is important that plants are purchased from nurseries that do not use pesticides as part of their production process.

Establishment

Thorough weed control is essential prior to establishing pollinator habitat. In many cases, projects are seeded into fields that were previously in soybeans or corn, as agricultural production can help ensure that weeds are sufficiently controlled. It is important that pesticides (such as neonicotinoids) that persist in the soil were not used prior to planting, as



Wild bergamot in a conservation planting.

they can be taken up into plant tissues and affect pollinators. Individual pesticides should be investigated to determine their persistence in the soil. In residential yards it is recommended to cut away the sod prior to planting to remove weed root sand seed.

Cover crops such as oats or winter wheat can be used to stabilize sites if additional time is needed for pesticides to break down in the soil or to stabilize soils prior to the planned seeding date. Drill or broadcast seeding is often conducted in the fall to allow forbs to naturally stratify over winter and compete with grasses in the spring. Some forbs that are important for pollinators such as sneezeweed, Dutchman's breeches, bugleweed, wild bergamot, evening primrose, smooth blue aster, mountain mint and aromatic aster do not require pre-stratification and can be successful seeded in the spring. If broadcasting seed, rolling can be used afterward to help ensure good seed to soil contact and prevent the loss of seed from wind and birds.



Beyond bees, many other insects are useful pollinators like this sand wasp.

Maintenance

The maintenance of pollinator plantings can be challenging due to the high forb diversity and difficulty of removing weeds without harming native plants or pollinators. Key steps to the maintenance of pollinator plantings involve:

- Mowing annual and biennial weeds to 4-6 inches as needed during the first one to two years of establishment to provide sunlight and to decrease competition for seedlings.
- Hand pulling of weeds. This is often most effective after rainfall when weeds are easier to pull.
- Prescribed burning to maintain diversity and to control woody species after establishment. Burning should only be conducted on 1/4-1/2 of large sites each year to minimize impact on insects and patchy burns are ideal to provide areas of refuge. Burns are often conducted in the fall or early spring to promote floral diversity and minimize impact to pollinators.
- Conservation grazing following grazing plans can be used to reduce the percent of cool-season grasses in conservation plantings and promote floral diversity.
- Biocontrol of invasive species may also be a long-term maintenance strategies to minimize herbicide use and control weeds. Biocontrols are available for leafy spurge, spotted knapweed, purple loosestrife and Canada thistle.
- When herbicides will be used for management it is important that target species (such as Canada thistle or wild parsnip) are not in bloom when they are sprayed and that spot herbicide application is conducted rather than broadcast spraying.



Early spring prescribed burn.

Information Sources

[Minnesota NRCS Pollinator Conservation Planning Documents](#)

[Pollinator Habitat Assessment Form and Guide](#)

[Upper Midwest Plants for Native Bees](#)

[Pollinators and Roadsides, Roadside Management for Bees and Butterflies](#)

[Pollinator Conservation in Minnesota and Wisconsin](#)

[Pollinators in Natural Areas](#)

[Protecting Bees from Neonicotinoids in Your Garden](#)

[Using Farm Bill Programs for Pollinator Conservation](#)

[Monarch Habitat Guidebook](#)

[Conserving Bumblebees](#)

