PROMOTING POLLINATOR HABITAT IN WETLANDS

TECHNICAL GUIDANCE DOCUMENT

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INTRODUCTION

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 losses.

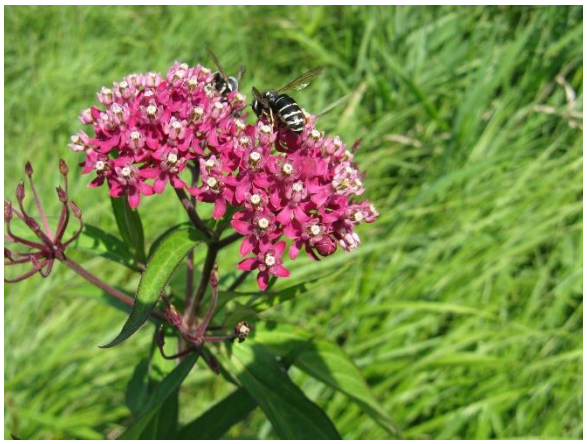
Sneezeweed is used by a variety of native bee species

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.

Other pollinators of concern include Butterflies, moths, beetles, and native flies. 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 foraged between native pollinators and native vegetation that keep both populations healthy.

Many agencies and conservation groups are focused on finding ways to benefit declining populations of pollinators and other beneficial insects. Wetland restoration projects can be important areas to establish pollinator habitat due to the protection of wetland sites, variety of habitats and diversity of flowers that can be part of wetland and upland buffer plantings. Wetland restoration projects can also meet the clean water and nesting needs of pollinators.

APPLICATION



Marsh milkweed establishes well from seed and provides important habitat for Monarchs as well as other pollinators

Maximizing Floral Diversity – A variety of plant communities provide a diversity of floral resources that help support pollinator populations. Wet meadow and wet prairies, along with shrub wetlands are some of the most diverse communities. As part of wetland restoration projects the native seedbank can often provide diversity from species such as smartweeds, beggars-ticks, bugleweeds, hedge nettle, jewelweed, and blue vervain among other species. Wet meadow and wet prairie seed mixes are often used to supplement diversity levels. Some species such as marsh milkweed, sneezeweed, asters, native sunflowers, golden alexanders and goldenrods do particularly well from seed and seed mixes can be adjusted based on species that may establish from the seedbank. Mixes can also be maximized with species that are of high value to pollinators such as milkweeds, Joe-pye weed, sneezeweed, and wild mints. Restoration practitioners often try to ensure that all plant functional groups (asters, legumes, milkweeds, mints, other forbs, cool-season grasses, sedges, rushes, etc.) are filled for a seed mix to mimic natural plant communities and provide habitat for as many species as possible. In addition to seed, species can also be added as containerized plant, particularly for species that may not establish well from seed, or establish slowly such as species of liatris and lilies. When installing containerized plants supplemental watering may be needed if there is not sufficient soil moisture.

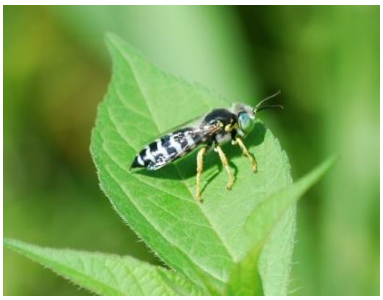
Shrubs can also provide an important early source of nectar and pollen for pollinators. Willows bloom early in the spring and can be an important early resource for bees when few other plants are flowering. Both willows and dogwood can be added as cuttings into projects with saturated soils, or as containerized plants. Some species such as native Spiraeas, Viburnums, and Buttonbush have been seeded into wetland projects and are also available as containerized plants.

In addition to seeded wetlands, upland buffer plantings also play a key role in providing pollinator habitat, as they often include a diversity of flowers that are beneficial to a wide range of species. Specific pollinator plots that are flower rich areas a half-acre in size to three acres can also be incorporated into upland buffer plantings to maximize pollinator habitat.

Providing Nesting Habitat: The nesting needs of native bees varies for different species with some that nest in the ground, and others that nest in the stems of woody or herbaceous plants. The planting of clump forming native grasses in uplands often provide areas of bare soil that benefit ground nesting species such as bumbles and mining bees. Plants that form hollow stems such as elderberries, native grasses, Joe-pye weed, and cup plant provide important habitat for stem nesting species such as carpenter bees.

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 they can be taken up into plant tissues and affect pollinators. Individual pesticides should be investigated to determine their persistence in the soil.

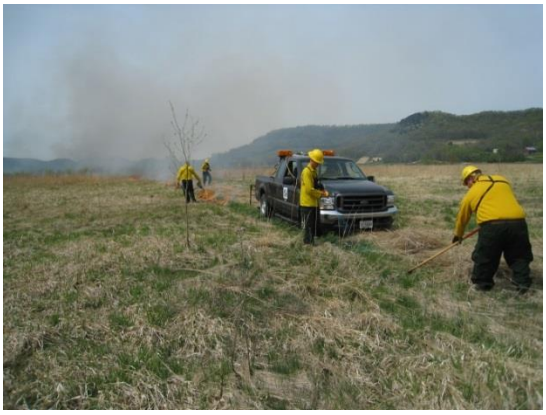
Cover crops such as oats or winter wheat can be used to stabilize sites if additional time is needed for pesticides to break down in the soil or to stabilize soils prior to the planned seeding date. Drill or broadcast seeding is often conducted in the fall to allow forbs to naturally stratify (break their seed coat) 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 successfully seeded in the spring. If broadcast seeding, 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.

Managing Floral Diversity - Wetland plant communities such as wet meadows, wet prairies and shallow marshes, often transition to a dominance of grasses or sedges over time, so natural or human disturbance such as flooding, conservation grazing and prescribed fire or other methods may be needed to maintain floral diversity . Reed canary grass in particular poses a risk to diversity, though it can be controlled through combinations of conservation grazing, prescribed fire, and spot herbicide application. Grass specific herbicides applied in late spring or early summer can be used in areas with no standing water (they are not aquatically certified) as a way to control invasive grasses.

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



Early spring prescribed burn.

- 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.

OTHER CONSIDERATIONS

Restoring flowering plants for insect diversity in wetland restorations can benefit a wide range of wildlife species. Many songbirds in particular rely on insects as a food source, particularly in the spring and summer.

COSTS

Costs: Cost related to adding floral diversity can vary greatly depending on seed mixes and other plant materials to be used. Diverse wet meadow or wet prairie seed mixes cost around $700-$800 per acre though seed can also be hand collected and sown into restored or natural wetlands or upland buffers as a low cost method of increasing diversity.

ADDITIONAL REFERENCES

BWSR Pollinator Toolbox
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