



Pollinator

PREDICAMENT

BY EILEEN DOWD STUKEL,
WILDLIFE DIVERSITY COORDINATOR

Pollinators play a crucial role in the world. An alarming trend indicates all was not well with the animals that pollinate wild and cultivated plants. There are some suggested practices landowners can incorporate to retain and enhance these important ecological players.

An estimated 60-80 percent of flowering plants rely on animals for pollination. Pollinators may be bats, birds or invertebrates, such as bees, butterflies, beetles, flies or moths. Roughly 35 percent of crop production depends on animal pollinators, in addition to wild plant species. Nothing in nature stands alone. Migratory and resident birds eat fruits, berries and seeds produced by insect-pollinated plants, and young birds rely heavily on pollinator larvae for early growth and development.

Pollinators in North America are mainly insects, such as bees and butterflies. Honey bees were introduced to North America, but our continent hosts about 4,000 native bee species. Native bees pollinate apples, cherries, squash, watermelons and raspberries. Some crops do not require insect pollination, but it can increase crop yields and fruit production and quality. Insect pollinators need a place to nest and sources of pollen and nectar. Some pollinators are generalists; others require specific plants for the nectar adults eat and the pollen they use to feed their larvae.

One of the first alarming events in the pollinator world was the disappearance of honey bees, a phenomenon eventually called colony collapse disorder. As with most natural events, no single cause has been identified for the dramatic die-offs and disappearance of honey bee colonies. The list of suspects includes habitat loss,

pesticides, diseases, parasites and invasive species. While scientists and bee keepers continue to search for answers, many have gained new appreciation for the unsung role of native bees.

Students of ecology know the diversity of plants and animals is key to healthy, natural systems. Even before recent challenges, honey bees never fully replaced native bees. Many native bees forage earlier and later in the day than honey bees and may pollinate flowers under weather conditions that keep honey bees in the hive. Many native bees forage for both pollen and nectar, compared to nectar-seeking honey bees.

Most native bees are solitary and do not sting. More than two-thirds of them nest in the ground. Others nest in tunnels in wood, often in holes created by beetle larvae. Bumble bees are well-known colonial native bees that nest in small cavities. These are the nesting areas native bees seek out. Other primary needs include sources of pollen and nectar.

To accommodate native bees, first assess what you already have. If native bees are present, what plants are they using and what others do they need? Have you noticed bee nests in the ground, in trees or shrubs, or in old rodent burrows? Avoid destroying such sites. Choose from available resources or consult experts to select plants with a wide range of blooming times. Select plants that come from local seed and that are adapted to local growing conditions. Native bees need sources of nectar and pollen from spring through fall. A pollinator planting should ideally have at least three blooming species during each season. Consider proximity to crops. Research has shown farms with natural areas less than a half mile from field edges will have greater native bee diversity and associated pollination benefits. Incorporate grasses, which

are larval food sources for butterflies, as well as potential nesting sites for bumblebees.

When selecting sites for native bee habitat, exploit areas that are unproductive for agricultural uses. Use hedgerows, sites along waterways and areas with poor soils or that are difficult to irrigate. Reduce use of toxic insecticides and risks from spraying drift. When selecting sites to create or enhance for native bees, take into account that most forage in an area from 50 feet to a half mile. Consider making habitats as large as possible and close to insect-pollinated crops and consider opportunities to create corridors, such as roadsides, drainage ditches and fencerows.

Select pesticides that are least toxic to bees, control pesticide drift and consider the formulation (soluble powders or granular formulation are generally safer than dusts or wettable powders) as well as the timing. Be aware that pesticide labels are developed mainly with honey bees in mind, without considering that native bees can be active for longer periods than honey bees.

A second major event in the pollinator story is the dramatic decline of the beautiful and highly-recognizable monarch butterfly. The monarch is a unique species because it has a very large breeding area (estimated at 390,000 square miles) and a very small wintering area of only a few acres. Monarchs east of the Rocky Mountains are members of the eastern population; those west of the Rockies are members of the western population. Monarchs from the eastern population migrate to central Mexico each fall, overwintering in clusters in cool, high-elevation forests. They live off lipid reserves and do not feed until February. This generation breeds in the spring during migration.

Although the species is considered secure, some experts believe the eastern population is in grave danger. A petition was filed with the U.S. Fish and Wildlife Service (USFWS) to list the monarch subspecies *Danaus plexippus plexippus* under the authority of the Endangered Species Act. This subspecies includes both the eastern and western populations. The USFWS concluded that listing may be warranted and solicited information for a status review, which is in progress.

Regardless of whether the USFWS determines the monarch should be listed under the Endangered Species Act, like colony collapse disorder, this butterfly's decline has spurred increased awareness of the value and needs of pollinators. Unlike

THREATS TO MONARCH BUTTERFLY DECLINE

- ✿ Loss of milkweed breeding habitat from increased use of genetically-modified, herbicide-resistant crops and use of glyphosate (Roundup®). Milkweed does not survive this herbicide.
- ✿ Loss of roadside habitats formerly allowed to grow into milkweed and other “weeds” due to mowing, reforestation, loss to development and insecticide applications for mosquito control.
- ✿ Loss and degradation of wintering habitat to deforestation, illegal logging and inappropriate ecotourism. Loss of the dense and mature canopy cover in central Mexico harms overwintering monarchs by exposing them to more extreme weather, causing them to use up their stored lipid reserves.
- ✿ Severe and changing weather conditions and projected climate changes in central Mexico may make much of the suitable habitat unsuitable in the future and there is little available habitat at higher elevations.
- ✿ Pesticides - in addition to the impact of the herbicide glyphosate, pesticides with neonicotinoids cause paralysis and death in insects. The impact on monarchs is presently unknown.

some generalist pollinators that can take pollen and nectar from a variety of plants, the monarch is a specialist that requires milkweeds for the female to lay eggs on and for larvae to eat. North America has more than two dozen milkweed species that may meet the monarch's needs. Besides serving this specialized need for monarchs, milkweeds provide nectar for many insects and can grow in a variety of sites.

Increased awareness about pollinators has generated a variety of information to help enhance pollinator-friendly habitats on roadsides, farms, ranches, natural areas and flower gardens.



HABITAT MANAGEMENT RECOMMENDATIONS TO HELP MAINTAIN AND ENHANCE POLLINATOR COMMUNITIES

✿ Inventory - determine plant resources and existing pollinator habitat. Identify rare or specialist pollinators and investigate their life cycle and related habitat needs.

✿ Grazing can be a useful tool when timing, intensity, duration, livestock type and history of grazing on the site are considered. Managed grazing can help control invasive species and help maintain open, herbaceous areas. Knowing that pollinators need nectar and pollen from spring through early fall may direct grazing in pollinator plots to late summer and fall, when most flowers have died back or pollinators are dormant. Generally, pollinator plots thrive with grazing for short periods and long recovery times.

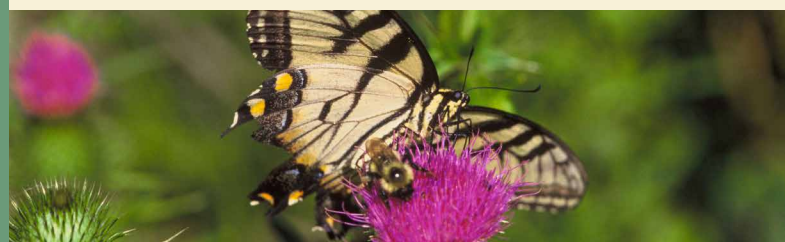
✿ Fire must be used conservatively, especially in areas with limited pollinator habitat. Consider the importance of refugia as a source of insects to recolonize burned areas. Incorporate “skips” of small, unburned patches. Avoid high-intensity fires unless the goal is to remove brush or trees. Generally, pollinator enhancement involves low-intensity burns early or late in the day conducted from late fall to early spring.

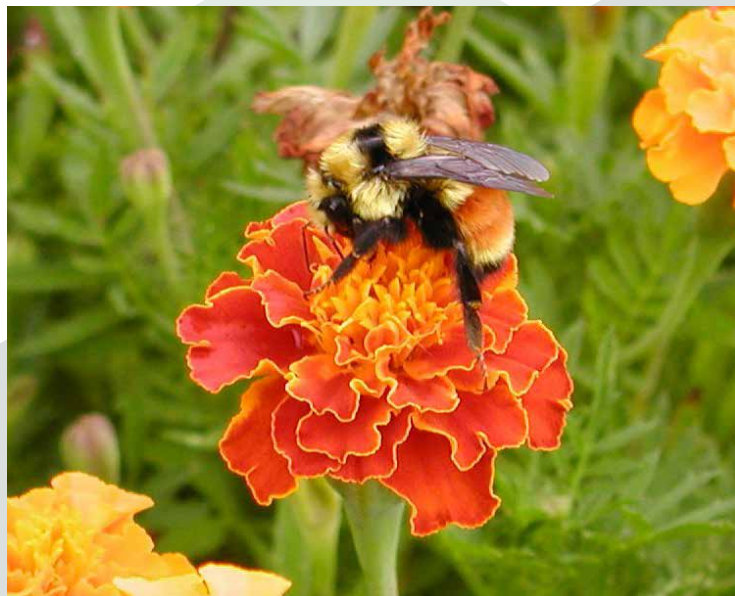
✿ Mowing is another tool to apply carefully to avoid destruction of insect eggs, larvae, and adults. Avoid mowing when flowers are blooming, except for targeted weed management. Mow after flowers have died back or are dormant, which also helps avoid destroying nesting bumblebees. Mow a mosaic of patches over several years rather than mowing the site all at once.

✿ Herbicides should be applied in a way that minimizes destruction of larval hostplants and adult forage plants. If possible, avoid broadcast spraying and pellet dispersal. Instead, spot-treat problem sites with a backpack sprayer or weed wipe.

✿ Insecticides should be selected for the least harmful formulation and application method. For example, dusts and microencapsulated insecticides are usually the most harmful formulations to bees and aerial spraying is the most harmful method. Safer alternatives are sprayed solutions and large granules. Using ground applications and coarse sprays help alleviate aerial spray drift. Maintain an insecticide-free buffer around plants needed by specialist pollinators and keep the need for insect refugia in mind.

✿ Roadside management can also incorporate pollinator needs and contribute to habitat corridors, such as those needed by migrating monarchs. Using a mixture of native grasses and flowering plants as roadside cover provides wildlife habitat, weed and erosion control, reduced need for spraying and mowing and an aesthetically-enhanced area. A researcher in Kansas found bees to be twice as abundant on roadsides with native plants compared to areas with nonnative plants, with 35 percent more bee species in the native areas. As with other habitat types, select plants that are adapted to the site and area and have different and overlapping blooming times. Apply appropriate spraying and mowing strategies, particularly early in the planting's establishment.





POLLINATORS ARE EASY TO INCORPORATE INTO BACKYARD GARDEN PLANS.

- ✧ Incorporate pollinator plants in an area that receives full sun for at least half the day in an area sheltered from the wind.
- ✧ Reduce or eliminate use of insecticides and be aware of risk of spray drift from other areas.
- ✧ Use native plants if available, but incorporate nonnative cultivated plants known to attract pollinators.
- ✧ Butterflies prefer purple, pink, red and yellow flowers over white flowers.
- ✧ Butterflies prefer flowers with flat tops or short tubes.
- ✧ Use plants that bloom at different times of the year to provide continuous food.
- ✧ Remember, caterpillars may need different plants than adults.
- ✧ Study which plants attracted bees and butterflies and modify your plans accordingly.

MORE INFORMATION CAN BE FOUND THROUGH THESE ONLINE RESOURCES:

✧ Pheasants Forever's Honey Bee and Monarch Butterfly Partnership
projectapism.org/?page_id=1410

✧ How NRCS is Helping Pollinators
nrcs.usda.gov/wps/portal/nrcs/main/national/plantsanimals/pollinate/help

✧ Farming for Bees: Guidelines for Providing Native Bee Habitat on Farms
xerces.org/guidelines-farming-for-bees

✧ Pollinators and Roadsides: Managing Roadsides for Bees and Butterflies
xerces.org/pollinator-conservation-roadsides

✧ Natural Areas and Rangelands
xerces.org/pollinator-conservation/natural-areas

✧ North American Monarch Conservation Plan
monarchbutterflyfund.org/?q=node/151

