

31. BEES AND OTHER PLANT POLLINATORS

Plants critical to wildlife that benefit from animal pollination include blueberry, blackberry, apple, and serviceberry. Without bees, these plants that sustain bear, deer, turkey, and moose would be far less productive.



Photo courtesy of Leif Richardson.

SUMMARY

Bees are an important pollinator for many plants upon which other wildlife depend. Promoting bees on your property helps pollination of maples, apple trees, berries, and other fruits, which in turn promotes both non-game and game species such as deer, bear, and turkey. Landowners wishing to manage for bees and other pollinators should maintain a diversity of forest types, promote the growth of native flowers and flowering plants, and avoid the use of many types of pesticides on their gardens and crops.

NATURAL HISTORY

Plants form the base of the food chain, the structure of the habitat, and the cover necessary for all species of Vermont's wildlife. To manage these plant-based habitats effectively for birds, mammals, and other wildlife, the processes that sustain them must be understood. And critical to plant reproduction is the role that bees, flies, beetles, moths, butterflies, and other animals play in moving pollen from one flower to the next. This section will focus on managing bee habitats, since bees are by far the most important pollinators.

The recent population crashes of commercial honeybee colonies have raised awareness of bees' importance to people and wildlife as crop pollinators, as 60 to 80 percent of wild plants are dependent on bees and other pollinators. Plants critical to wildlife that benefit from animal pollination include blueberry, blackberry, apple, and serviceberry. Without bees, these plants that sustain bear, deer, turkey, and moose would be far less productive.

Approximately 4,000 species of bees are native to North America, and about 275 of these are found in Vermont. Honeybees are not native to this continent, and, in their current state, are relatively unimportant pollinators in natural settings. These bees all have one important habit in common: they feed their offspring pollen. In gathering this food from flowers, bees inadvertently transfer pollen grains from one plant to the next, thus allowing the plants to form seeds and fruits. Bumblebees are highly visible examples of this foraging strategy, readily switching from one type of plant — and habitat — to the next. About 20 percent of our bees are pollen specialists, meaning that they are adapted to gather pollen from just one plant family, genus, or even species.

Most of our wild bees are known as “solitary bees,” meaning that they lack the complex social structure of honeybee colonies. Females of these species establish solitary nests, provision their eggs with pollen, then die before their offspring emerge. Though some solitary bees nest in communal aggregations, the adult bees have little interaction with each other.

By contrast, the societies of our social species feature cooperation, a division of labor, and much communication. The most visible of these are the bumblebees, which establish colonies in spring to early summer.

HABITAT REQUIREMENTS

Bees have three basic habitat requirements: nesting sites, overwintering sites, and access to the plants to which they are adapted. Most of Vermont's wild bees nest in tunnels they dig in sandy, silty, or loamy soils. Flat or gently sloping substrates are generally preferred, and the bees often choose areas with sparse vegetation. Examples of ground nesting bees are the many species of mining bees and sweat bees found here. About one-quarter of the bees in this area nest in preformed cavities they find in twigs, acorns, snail shells, tree trunks, and other wood. Many of these bees seal their nests with 'doors' made of chewed leaves, which has earned them the name 'leafcutter bees.'

Bumblebees nest in old rodent dens, above-ground cavities in dead trees, under tussocks of dry grass, in heaps of decomposing plant matter, and many other places. And, a small number of bees actually excavate their own nest cavities in sound wood. This includes the large carpenter bees, which are found only in extreme southernmost Vermont.

When managing for bees and other pollinators, maintaining an abundance and diversity of flowering plants throughout the growing season is critical. Trees such as maples, willows, and apples are important sources of bee food in early spring. Spring wildflowers found in the understory of hardwood forests are critical to large number of bees that also pollinate the fruiting trees and shrubs many other animals depend on. Open wetlands feature many pollen and nectar sources for bees, including blueberries, cranberries, Labrador tea, water lilies, Joe-Pye weed, and asters. Fields and other openings usually support suitable bee forage. Farms and gardens can offer excellent bee forage. Plants that do not offer forage to bees include those that are wind pollinated, such as beech, birches, oaks, grasses (including corn), sedges, and the non-flowering plants like ferns and horsetails.

Adult bees do not migrate, but seek winter shelter in underground cavities, hollow twigs, and other places. Little is known of the requirements of bees in winter, but they are thought to seek shelter that is protected, dry, and relatively stable in temperature.

MANAGEMENT PRACTICES

Loss of habitat is implicated in the declines of some bumblebees and other pollinators. Subdivision, development, and greatly intensified agricultural operations have been shown to reduce bee abundance and diversity.

Fortunately, managing for bees and other pollinators involves many of the same practices employed for other wildlife. In general, habitat diversity will lead to a diversity of bees and other pollinators. Bees must have continuous access to an array of native flowering plants, which can be achieved by maintaining a patchwork of mature forest, forest with sunny openings, functioning wetlands, old fields with a mix of flowering forbs and shrubs, and fields with areas that are not heavily cropped for



Figure 31.1

Meadow with native wildlife flowers.

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corn or hay. Patches of flowers on the margin of farm fields, lawns, and in hedgerows can be critical to bees, and should be maintained. Bees are attracted to the flowers of some invasive plants (e.g., purple loosestrife), but others may impoverish bee habitat by crowding out native flowering plants. Plants favored by bees include goldenrod, aster, and sunflowers, willows, blueberry family plants (including blueberries, cranberries, and maleberry), dogwood, spring beauty, native species of loosestrife, and pickerel weed.

To manage your property for bees, consider the nesting needs of the bees at work on your land. The sparsely vegetated and uncompacted soils of hedgerows, dry banks, and forest roads are often inhabited by nesting bees. Tilling is detrimental to nesting bees, so leave some areas fallow among row crops. Maintain an abundance of woody material that might house cavity nesters, including pithy plant stems, sumac, and logging slash. When conducting habitat improvement work such as apple tree release, consider leaving some dead wood as nesting habitat for bees. And just as you can provide nesting boxes for wood ducks and bluebirds, you can augment nesting habitat by providing blocks of wood with predrilled holes in them, as well as shoebox-sized wooden boxes for bumblebees.

One of the greatest detriments to bees is the widespread use of pesticides. Limiting the use of these chemicals in agricultural and other settings will benefit bees and the wildlife that depend on their services. Of particular concern are pesticides applied as dusts or small pellets, those applied to flowering plants, and the neonicotinoid class of pesticides.

Finally, you should pay attention to the activities of bees on your property. Noticing trends in bee abundance on plants from year to year can help you evaluate whether you are getting this valuable ecosystem service. Poor fruiting of apples, blueberries, and other plants mentioned above may signal a need to increase pollinator habitat. Becoming familiar with a few of the more obvious pollinators may aid you in this type of monitoring.



RESOURCES

U.S. Department of Agriculture. National Resources Conservation Service. "How Farmers Can Help Pollinators." <http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/plantsanimals/pollinate/farmers/>

Agroforestry Notes.

- . "Improving Forage for Native Bee Crop Pollinators." http://www.plants.usda.gov/pollinators/Improving_Forage_for_Native_Bee_Crop_Pollinators.pdf
- . "New England Pollinator Handbook." November 2009. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_010204.pdf
- . "Pesticide Considerations for Native Bees in Agroforestry." http://www.plants.usda.gov/pollinators/Pesticide_Considerations_For_Native_Bees_In_Agroforestry.pdf

Xerces Society of Invertebrate Conservation. "Pollinator Habitat Guidelines." <http://www.xerces.org/pollinator-conservation-managing-habitat/>