

Bees in the Woods

Pollinators in Eastern Deciduous Forests



A cellophane bee (*Colletes inaequalis*) collecting pollen from the flowers of a sugar maple tree. (Photo: Max W. McCarthy.)

Although we may think of bees as creatures of sunny meadows and gardens, eastern bees evolved in a historically forested landscape. Precolonial deciduous temperate forests were shifting mosaics of multi-aged vegetation and openings created by disturbances such as disease, storms, wind, beavers, and fire, including through Indigenous stewardship. Therefore, many eastern bee species have evolved to use different ages, elements, and parts of a complex forest system.

Where Do Bees Go When They Leave Your Garden?

Many bees fly back to nest in hedgerows and forests! **Up to two-thirds of northeastern native bee species rely on forests for part of their life.** Forests provide food, nesting and overwintering sites, and protection from pesticides.

Some forest-associated bees are important agricultural pollinators; even a small forest patch or hedgerow can increase pollination of adjacent crops. For example, some bumble bee queens nest and overwinter in forests. From late spring through fall, the workers forage in nearby orchards, gardens, and forest openings.

Many forest-associated solitary bees are only active in the spring, when various understory plants and canopy trees bloom. Some forest bees are specialists and will forage on a limited range of plants, often just a genus or species, to feed their young. For example, the spring beauty mining bee (*Andrena erigeniae*, left), only collects pollen from spring beauty flowers and relies on this understory habitat to survive.



Photo: Max W. McCarthy

Bee Habitat: In All Forest Ages and at All Heights



Canopy

Each blooming tree is a temporary “meadow in the sky,” providing huge amounts of pollen or nectar. Different bees need different trees! Important trees include maple (left), willow, cherry, oak, black gum, linden, and tuliptree. Insect-pollinated trees are an abundant source of pollen and nectar for bees, but even wind-pollinated trees such as oak can provide protein-rich pollen.

Woody Material

Downed woody material, standing snags, and rotting stumps provide nest sites for wood- and cavity-nesting bees. Deadwood of different ages, species, sizes, and moisture levels will, in turn, support a diverse insect fauna. The shiny green sweat bee (*Augochlora pura*, right), is a charismatic and familiar forest-associated species that nests in snags, stumps, and downed woody material.



Gaps and Openings

Bees visit forbs and shrubs on forest roads, edges, recent timber harvests, and thinned or burned stands. That is, anywhere with sun! Openings support numerous forest-associated and open habitat-associated bee species. In the first 1–10 years following a disturbance, a flush of flowers and shrubs, such as raspberries (left), can provide abundant pollen, nectar, and nesting resources.

Forest Floor and Understory

Spring understory flowers support a diverse array of bee species. Many solitary bees nest in soil, like the spring beauty bee (page 1). The adults fly for just a few weeks, and the rest of their life cycle happens underground. Bumble bee (*Bombus* spp.) queens often hibernate under duff or leaf litter. After emerging, they rely heavily on pollen and nectar from understory forbs, such as Bellwort species (right), to start a new colony for the year; this stage can be a bottleneck in successful colony development.



Acknowledgments

Written by Kass Urban-Mead. Reviewed by Kristi Sullivan, Eric Hansen, Kelly Gill, Max W. McCarthy, and Matthew Shepherd. Edited and designed by Raven Larcom.

This material is based upon work supported by a U.S. Department of Agriculture (USDA), Natural Resources Conservation Service grant under agreement number NR213A750008C008. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the views of the U.S. Department of Agriculture.

© 2025 by The Xerces® Society for Invertebrate Conservation. X Xerces® is a trademark registered in the U.S. Patent and Trademark Office. The Xerces Society is an equal opportunity employer and provider.