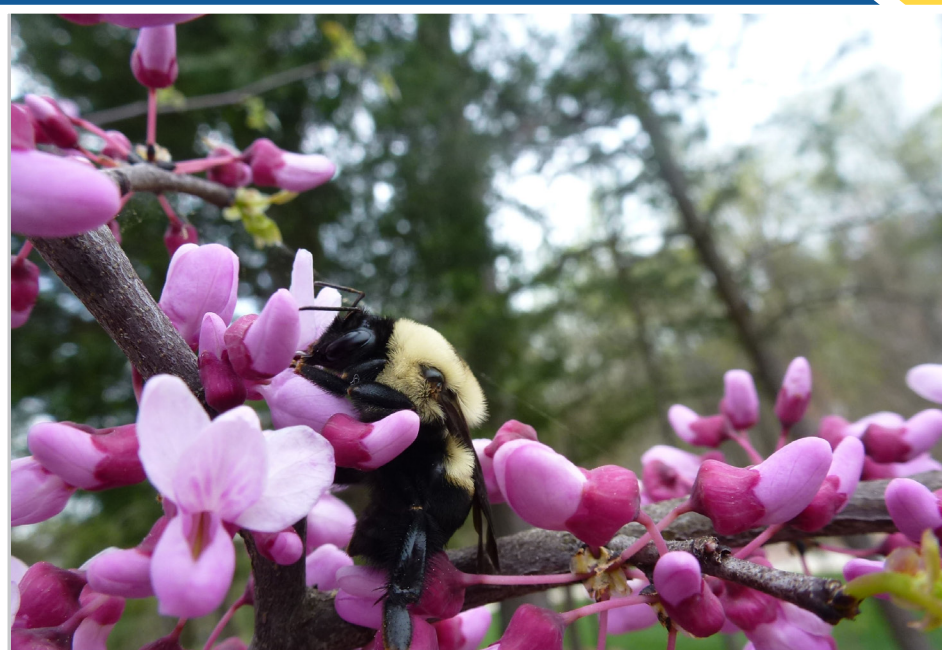


## Woodland Pollinators

**M**ost landowners are familiar with pollinators – the most common, of course, is the honeybee – but there are many other pollinators, and woodland owners are starting to learn about the benefits of broadening the pollinator profile.

While honeybees account for approximately 75 percent of crop plant pollination and many tree species count on wind pollination, several other animals and insects help pollinate grasslands and forests, including birds, bats and other mammals, lizards, flies, moths,



butterflies and beetles, and more than 4,000 native species of bees in the U.S., like mason, sweat and carpenter bees.

This is why conservation districts in a number of states are beginning to explore management plans that incorporate woodland pollinator habitat.

“Woodlands and agroforestry practices provide important habitat for wild bees, bats, butterflies and other pollinators and they are vital for safeguarding ecosystems, for biodiversity and for crop production,” said Gary

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## Districts can have an impact

Public concern about pollinator health has inspired countless actions by landowners, managers and communities, to create habitat for the bees, butterflies, moths, wasps, hummingbirds and bats that pollinate our crops and natural vegetation. And woodlands play an important role.

Insect pollination is a critical component of woodland ecosystems. According to an NRCS estimate, for example, at least 36 tree and shrub species in the Western Coastal Plain of East Texas and Louisiana alone depend on insects for pollination. This relationship cuts

both ways. Woodlands provide foraging and nesting resources to pollinators. Some bee species, in fact, are dependent on specific shrub and tree species.

Many pollination benefits can be captured by integrating trees into agricultural systems. In fact, pollinator conservation is generally superior on farms with agroforestry than on homogenous fields without agroforestry. One reason is that trees and shrubs in temperate regions often flower early in the spring, thus delivering early pollen and nectar resources.

Conservation districts can have an enormous impact on enhancing woodland pollinator services by distributing information, establishing demonstration sites, and providing technical assistance. Find national information on the USDA National Agroforestry Center website,

for example. Seek out state-specific data, such as content provided by Michigan State University listing pollinator tree species and nurseries. Consider a demonstration site, such as the pollinator hedgerow planted by the Clackamas Soil and Water Conservation District containing about 20 pollinator species, including trees and shrubs. The creative energy, determination, and relationships that conservation districts employ every day will inspire interest and action in local areas across the country.



**Susan Stein**  
Director, National  
Agroforestry Center

# Somerset County SWCD explores the benefits of woodland pollinators

The Somerset County Soil and Water Conservation District (SWCD) in Maine is exploring the benefits of incorporating woodland pollinators into forest management planning efforts.

The conservation district leases a 280-acre parcel from the state of Maine to use as a demonstration forest, providing workshops

for state and federal agency staff, private landowners and the public. Programs range from harvest planning to tree identification, from patch cuts to wildlife management.

With heavily forested lands throughout the county, the SWCD has been exploring how to look at management with an ecological focus, including the impact of woodland pollinators.

"It ties in well with workarounds riparian buffers or patch clearing, but it also benefits tree species that are not focused on in silviculture," Somerset County SWCD Executive Director Joe Dembeck said.

The conservation district is working with landowners to expand their idea of what species are pollinators. In the past, pollination discussions were focused solely on honeybees.

"When landowners take the time to observe the activity on their properties, they will find sweat bees, flies, moths, solitary bees and other insect pollinators," Dembeck said.

With red and sugar maples, hemlock, aspen, red oak and white pine, among

other trees, in the demonstration forest, and patch cuts and thinned areas (canopy gaps) recently implemented there, Dembeck is able to develop pollinator education. Currently, the conservation district plans to gather pollinator species data with day and night collections in 2021, which they hope to utilize in outreach and education efforts with partners later next year.

"It really opens (landowners') eyes that they can do a thinning or patch cut and let it make its way through natural progression," Dembeck said. "You don't have to do anything, just hold yourself back from doing things right away and understand just because you can't harvest an understory species, it does have a large benefit to the small and big wildlife and the forest ecology."

Partners involved with the demonstration forest include the Maine Department of Agriculture, Conservation and Forestry; University of Maine Extension-Somerset County Office; and Maine Woodland Owners.

## Five things conservation districts can do

Conservation districts are well positioned to advance the discussion around woodland pollinators. From the landowner to the local policy maker and the next generation of land stewards, conservation districts can carry the message. Here are some ideas for how they can become involved:

**1 – Education and outreach.** Conservation districts can hold demonstration programs for community members and agency partners or incorporate the topic into their talks when visiting area classrooms; this can include working with scientists, managers and other individuals who work with pollinators. Information can be added to publications and the conservation district website. Districts can help promote agroforestry practices that incorporate pollinator considerations. The opportunities to educate are limitless.

**2 – Provide pollinator bundles.** Many conservation districts organize annual tree sales, which attract community members interested in land management. "Offering pollinator bundles of region-specific trees and shrubs can be a great way for conservation districts to support woodland pollinators," said Gary Bentrup, research landscape planner with the USDA National Agroforestry Center. "For example, Kansas State Forest Service offers bundles of five to seven native species of shrubs and small trees to landowners that provide season-long resources for bees, butterflies and moths, and hummingbirds."

**3 – Form partnerships.** Conservation districts are well connected locally, but this may present an opportunity to expand the list of partnerships. "They can connect with the local master gardeners club, area university faculty, NGOs (e.g., the Xerces Society) or other local programs designed to improve our understanding of pollinators," said Jim Rivers, assistant professor in the College of Forestry at Oregon State University, "or recruit local nature enthusiasts to become volunteers for tracking data." Community partnerships will assist in communication and education efforts and increase interest and exposure of woodland pollinators.

**4 – Provide feedback.** Agency partners are only beginning to explore the topic and develop solutions. Feedback is critical in helping them build programs that cater to landowners of all sizes and from all parts of the country. For example, Somerset County SWCD in Maine has provided feedback to NRCS about its pollinator cost-share opportunities because the seed mix available through the program contains some plants that are non-native to Maine, creating concern about introducing invasive species that may do more harm than good.

**5 – Include woodland pollinator goals in management plans.** There is no better time to advance the discussion of woodland pollinators than when a landowner is preparing to build (or update) a conservation plan. This is the time to remind them that every inch of the property can be built into the plan, and that woodland pollinators are one thing to consider. "Management plans can often include best practices to increase the habitat value for woodland pollinators," said Bentrup. "For instance, incorporating flowering trees and shrubs, leaving a snag where possible, creating patches of bare soil for ground-nesting bees, and cutting shrubs with pithy stems to allow for tunnel-nesting bees to make nests are some of the available actions."



## Oregon district conducts woodland pollinator research

The West Multnomah Soil and Water Conservation District (SWCD) in Oregon is working with landowners to find ways to manage invasive species in understory with plantings that improve forest health. They are also working to broaden how landowners view pollinators through outreach and ongoing research.

“Woodland owners are aware of the importance of wildlife habitat,” said Laura Taylor, West Multnomah SWCD conservationist and education coordinator. “When they approach us to address their habitat needs, many have been receptive to the idea of pollinator habitat being an integral part of the wildlife habitat and health of their woodlands.”

“Our work begins with providing resources and pointing out opportunities where woodland owners can increase or improve

pollinator habitat in their forests,” Taylor said. “We meet many landowners who would love to increase pollinator habitat but don’t have the financial resources or know-how.”

To help address this gap, West Multnomah SWCD encourages and helps with thinning and creating space for more shrubs and forest floor flowers to become more vigorous. They leave much of the cut logs and snags on-site to provide more resources for bees that nest in wood cavities.

The conservation district also promotes planting more diverse mixes of trees and shrubs if the landowner is replanting or thinning. Diversity is key to increasing pollinator habitat, which the SWCD has seen through studies they have conducted over the past four years.

The first study ran from 2016 through 2018 and focused on diversity and abundance of pollinators and what types of habitat worked best for those pollinators. Currently, West Multnomah SWCD is conducting a second research project to determine the most effective and efficient way of planting understory, and other areas previously invaded by non-native species, to benefit pollinators.

“The distinction between forest pollinators and other pollinators is still an area of research, but I’ve observed that bees go into the forest and access the forest for particular resources they would not be able to get from the farmland,” Taylor said.

“The more diverse the landscape is with forests, farms and meadows, the more diverse the pollinators will be, and the better the pollination,” she said.

Taylor led West Multnomah’s Community Science Pollinator Monitoring project, an effort that ran from 2016 to 2018. The project trained volunteers to identify different types of bees, which account for more than three-quarters of pollination, as well as other pollinators. The volunteers were also trained to identify types of plants the pollinators visit and were then paired with private landowners who had pollinator habitats planted by the district.

For three years, from April to September, the volunteers observed the habitats, collecting data on pollinator diversity, abundance and the types of plants they visited, whether tree, shrub, native or introduced forbs.

Beginning in 2019, through a Natural Resources Conservation Service (NRCS) Conservation Innovation Grant (CIG), West Multnomah SWCD switched gears to study how to plant forest understory flowers from

seed, and which method or methods have the highest number and diversity of plants.

This research will continue through 2020. With additional funding, the group hopes to further study which plants will draw the most pollinators.

Taylor explained there were some indications in the first research project (e.g. native plants had a higher number of visits and more varied pollinators than introduced plants by roughly a three-to-two ratio), but that project did not account for the abundance of each plant species well enough to draw solid conclusions.

While Taylor was certainly aware that pollinators use the woodlands, it was during preparation of the understory in a Douglas fir stand for the second project that she realized to what level.



**“The more diverse the landscape is with forests, farms and meadows, the more diverse the pollinators will be, and the better the pollination.”**

— Laura Taylor

“I was raking the fir needles and all of a sudden all these bumblebees were there,” she said. “There were a bunch of them hiding under the fir needles getting ready to overwinter. Clearly, they need that space for shelter to overwinter and not be disturbed.”

West Multnomah SWCD has partnered on its work with other agencies, including Oregon State University Extension’s Master Naturalist Program, the Xerces Society, NRCS and private landowners.



# Woodland Pollinators from page 1

Bentrup, research landscape planner at the USDA National Agroforestry Center.

Bentrup recently conducted a scientific synthesis on the role of agroforestry in supporting pollinators with collaborators from Xerces Society for Invertebrate Conservation.

"When these multi-story habitats have a diversity of flowering trees, shrubs and forbs, they can deliver a much higher density of floral resources due to vertical layering when compared to meadows," he said. "They can provide more value for the same amount of land area."

Research shows that the abundance and number of pollinator species increase in forestland when there are openings in the canopy. Additional studies conclude that prescribed burns provide new territory and nutrients for woodland pollinators that assist in understory regeneration, which ultimately can help in forest restoration efforts. Nevertheless, research on pollinators in managed forests, particularly in western North America, is limited.

"Although we know forests that have recently been subjected to disturbance can be good for pollinating insects, we are only beginning to understand which groups are present and how they respond to forest management," said Jim Rivers, assistant professor in the College

of Forestry at Oregon State University. Rivers researches how insect pollinators respond to natural and human-caused disturbance.

"Pollinators in forests have been almost entirely overlooked by researchers in the past because of the obvious importance of pollinators within agricultural settings," he said. "That said, I find it promising that so many groups, including NGOs, government agencies and private landowners now see the value of supporting research that enhances our understanding of forest pollinators and their habitat needs."

Many of the best management practices used for maintaining and improving forestland and wildlife habitat also promote pollinator activity. Flowering trees such as willow, basswood, black locust, maple and poplar that are more common in silvopasture systems or in hedge-rows and riparian buffers attract pollinators.

Logging and wildfire disturbance can provide access to mineral soil for ground-nesting bees and plant germination, light for plant growth, and leave stems and woody debris for nesting. The thinning and nutrients found after a prescribed fire allow seedbanks to restore the natural diversity and flowering plants that can benefit pollinators.



Gary Bentrup

Canopy openings in conifer forests and maintaining hardwood diversity allow more options for pollinators.

Just as bees have hairs on their legs for attracting pollen, birds can assist in pollination with their feathers. As their feathers brush against blooms, pollen clings to the feathers and is released when brushed against other blooms. Hummingbirds are common pollinators and enjoy nectar from deep blooms that typically occur on taller vegetation.

Providing such areas and debris within a forest structure keeps the pollinators closer to areas that benefit from pollination.

Woodland pollinator areas also enhance forest wildlife with corridors, nesting areas and cover, along with a variety of food sources, which in turn increases the abundance of pollinators.

## ADDITIONAL MATERIALS RELATED TO THIS SPECIAL REPORT



The National Association of Conservation Districts has a wealth of pollinator information on its website, including a curriculum section. <https://www.nacdnet.org/about-nacd/what-we-do/pollinators/>



Woodland Fish & Wildlife's report, "Forest Bee Pollinators," provides a list of woodland pollinator habitat and diagrams of the pollination process. The 12-page report was released in June 2020.

<https://woodlandfishandwildlife.com/>



The USDA National Agroforestry Center is operated through a partnership between the U.S. Forest Service and NRCS. It has dozens of publications and studies available on its website that highlight woodland pollinators.

<https://www.fs.usda.gov/nac/topics/wildlife-pollinators.php>



Xerces Society for Invertebrate Conservation has a 'pollinator conservation resource center' with region-specific information for habitat, monitoring and plant vendors, among other topics.

<https://xerces.org/pollinator-resource-center>



Pollinator Partnership's mission is to promote the health of pollinators, critical to food and ecosystems, through conservation, education, and research.

<https://www.pollinator.org/>

