



Pollination Science *Current Research*

Forest Service Research and Development is actively studying pollination science, to better understand the decline of pollinators and its consequences, and to contribute to preventing and recovering from pollinator losses.

Background

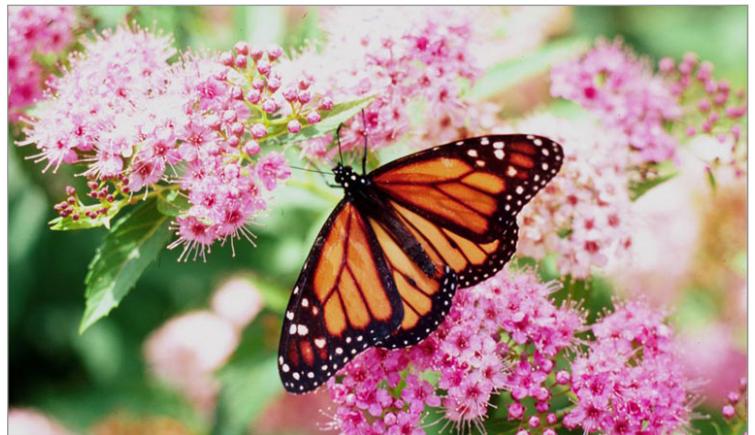
With over 80 percent of the world's flowering plants relying on pollinators, their importance to natural ecosystems and agriculture cannot be overstated. Public awareness about the critical roles that pollinators play and the ecosystem services that they provide has been growing, particularly due to concerns over declining populations. The loss of pollinators, including bird, bat, butterfly, beetle, and bee species, has been severe and threatens food production and environmental health. In recognition of their importance, the Secretary of the U.S. Department of Agriculture proclaimed June 16 to 22, 2014 as National Pollinator Week.

Forest Service Research and Development is studying the broader topic of pollination science, which includes the pollinators themselves, the role of plants in the process of pollination, and the synchronicity between blooms of flowers and pollinating insects. This briefing paper shares highlights of recent and ongoing research.

Research Activities

Monarch Butterflies and Milkweeds

There are currently international efforts to conserve Monarch butterfly populations, which complete incredible migrations of hundreds to thousands of miles each year across North America. For 2013-2014, the Monarch butterfly migration was at the lowest levels ever recorded. Along their migratory paths, Monarchs rely on habitats that contain milkweed species. Forest Service scientists are investigating [methods for propagating milkweeds](#). By making it easier to incorporate milkweed species into plantings, native plant nurseries and their clients can assist Monarchs and other native pollinators by creating suitable habitats in their native ranges.



Monarch butterflies rely on milkweeds.
Credit: Charles T. Bryson, Bugwood.org



Research Activities Continued

Pollinator Gardens

Across the country, Forest Service scientists are establishing pollinator gardens, providing these species with habitat and food sources while conducting research that contributes to our knowledge. This has been done by [Jeremy Pinto](#) and [Kas Dumroese](#) at the Moscow Forestry Sciences Laboratory in Moscow, Idaho and by [Rick Dionne](#) at the [Penobscot Experimental Forest](#) in Maine. At the Penobscot Experimental Forest, bee species that visit the pollinator garden are sampled and tracked in cooperation with a national group.

Invasives and Pollinators

[Invasive species](#) cost significant economic damage and threaten native biodiversity, including pollinator species. Chinese privet (*Ligustrum sinense*) is an invasive shrub of the Southeastern U.S. Forest Service researchers, [James Hanula](#) and [Scott Horn](#), have been investigating the [effect of Chinese privet](#) on bee and butterfly abundance and species richness. Their research has found that removing Chinese privet from forests is a relatively simple method of improving habitat for these important pollinator species and has benefits in the medium to long term.



Honey bee population declines are of great concern.
Credit: Joseph Berger, Bugwood.org

In the Southwestern U.S., cottonwood and willow forests are being invaded by invasive species such as Russian olive and salt cedar. Forest Service researchers, [Rosemary Pendleton](#), [Burton Pendleton](#), and [Deborah Finch](#), investigated the [effects of this change on native pollinator species](#). The researchers found that willow habitat is important to pollinator species, particularly bees, with the greatest insect abundance and diversity recorded.

Climate Change and Pollinators

Ecological interactions between plants and pollinators provide critical ecosystem services and are important drivers of biodiversity and community function. The Forest Service is investigating how climate change will affect plant-pollinator interactions. [Justin Runyon](#), a research entomologist and recent winner of the Presidential Early Career Award for Scientists and Engineers, is conducting this work and has established a pollinator garden using more than 30 native plant species at the [Bozeman Forestry Sciences Lab](#) in Montana.

Hardwoods and Pollinators

The northern and central hardwood zones of the U.S. currently meet most of the demand for hardwood lumber from the U.S. and Europe. However, hardwood production from these regions is threatened by numerous factors. Forest Service researchers, including [Charles Michler](#) at the Hardwood Tree Improvement & Regeneration Center in Indiana, are investigating different ways to improve hardwood production and forest management, including experiments on pollination for hardwood seedlings.

