



The Buzz on Bees

WHY NATURE NEEDS ITS NATIVE BEES

By Divya Abhat

Wildlife professionals know well that when habitat degrades, wildlife suffers. New research on the critical role of healthy habitat is suggesting that wildlife managers spend time examining some of the smallest members of the wildlife brood.

“Bees are the 900-pound gorillas,” says Rachael Winfree, a Postdoctoral Research Associate based at Princeton University, referring to their role in pollination. “Roughly half the plant species in the world use animal pollination,” she says. And it’s common knowledge that plants are at the base of any wildlife community, says Claire Kremen, Assistant Professor at the University of California, Berkeley. “Without our plants, we don’t have our animals.”

Though the well-being of native or wild bees and other pollinators may not be a high priority for some wildlife managers, evidence is mounting that perhaps it should be. In October 2006, the National Research Council of the National Academy of Sciences released the *Status of Pollinators in North America*, a report that documents a significant drop in pollinator numbers in the United States. Although substantial data on North American bee populations are lacking, researchers point to a trend showing a decline in bee numbers—both managed and wild. These declines seem to be due to a confluence of adversities, including pressures from invasive species, use of pesticides, and the spread of disease and parasites. Habitat fragmentation adds to the mix, propelled by intensive agriculture and forestry, and the development of housing, industry, and related infrastructure. Data from a paper published by researchers at the University of California shows that commercial honey bee populations—the primary contributors to crop pollination—have plummeted from 4 million to 2.4 million. Additionally, numbers of several wild bee species, notably the affable bumble bee, are also flying downward.

“If we lose our native bees, we will have a lower production of seeds and fruit, which will have ripple effects on other wildlife,” says Mace Vaughan, Conservation Director of The Xerces Society for Invertebrate Conservation. A decline in pollinators, Vaughan says, disrupts plant communities in wildlife ecosystems, in turn making it more difficult for

wildlife managers to maximize the productivity of that land. In short, he says, “Pollinators can really be a tool for guiding biodiversity conservation.”

Little on the Little Guys

While some researchers are studying the role and effects of wild or native bees in wildlife habitat, the pickings are slim. The dynamics of insect pollinators and ecosystem health in both natural and agricultural systems have not been well documented, not only because there are few pollinator monitoring programs, but also because there is a dangerous shortage of taxonomists working in the area.

“We call it a taxonomic impediment—this problem of not having enough scientists who know the taxonomy or the distribution for these species,” Vaughan says. Many of the experts in bee taxonomy are either retired or close to retirement, notes Sam Droege, biologist at the Patuxent Wildlife Research Center. The lack of a solid knowledge base of the basic taxonomy and ecology of bees makes it difficult to definitively assess their status. “We know so little about bees that we have no gauge to what their population status is,” Droege says. While reliable evidence on the loss of native bee species is steadily increasing, that data is not as useful as it would be if populations had been monitored over longer periods of time, which would provide a historical baseline with which contemporary data could be compared.

However, interest in the relationship between pollinators and habitat health has grown significantly since 2006, when commercial honey bee keepers began reporting mysterious honey bee losses unprecedented in size and numbers—a phenomenon referred to as Colony Collapse Disorder (CCD). “CCD has really shed some light on the importance of the native bee,” Vaughan says, noting that the “silver lining” of the spread of CCD is the attention it has drawn to the influential role of the wild bee.

Protecting Pollinators: What’s a Wildlife Manager To Do?

May Berenbaum, the head of the Department of Entomology at the University of Illinois Urbana-Champaign and chair of the Committee for the Status of Pollinators in North America, says wildlife



Credit: Jeff Vanuga/NRCS

Although the use of controlled fire can be an effective technique for wildlife management, it can also be a detriment to habitat health if pollinators are not considered.



Credit: Mace Vaughan/ The Xerces Society

Bees are considered the most important group of pollinators because of their efficient and versatile method of pollination. In 2000, the total value of bee-pollinated crops was estimated at \$18.9 billion.

managers need to “diversify the landscape to ensure that there are resources available to maintain wild pollinators.” Berenbaum notes that the ideal would be if all land stewards were “provided with information on what constitutes the appropriate plant material for attracting and maintaining pollinators.”

Indeed, some of those in the know about the need for practical information about how to keep pollinators happy have been working to that end. In February, the Xerces Society released a primer on habitat management for pollinators in natural areas, a guide that includes a series of recommendations specifically for wildlife managers. The primer reviews five general strategies that managers can

use to protect pollinators—all of which can be exercised *without* drastically changing existing wildlife management plans. Specifically, the strategies include managing fire, limiting grazing, controlling mowing, and mindfully using herbicides and insecticides. The recommendations “take into account the ecology, the habitat, the biology of these important insects,” Vaughan says, and explore “how their habitat needs can be met when site management is taking place.”



Credit: istockphoto.com/ Jan Tyler



Credit: The Xerces Society

The Xerces Society's primer on habitat management for pollinators provides wildlife managers with a series of recommendations for managing natural areas.



THE BUSY BEE

Wild bees play a crucial role in maintaining natural areas. They sustain plant communities that provide food and shelter for many other animals. The fruits and seeds that pollinators help produce are a major part of the diet of approximately 25 percent of birds and a vast array of mammals – from red-backed voles (*Clethrionomys gapperi*) to grizzly bears (*Ursus arctos*). By protecting bees and their habitat, wildlife managers can achieve their goal of preservation and conservation of wildlife refuges and, in turn, sustain ecosystem health.

Bees are also considered the most important group of pollinators because of their efficient and versatile method of pollination. Bee activities improve fruit size, enhance seed production, and bring about genetic diversity. In 2000, the total value of bee-pollinated crops was estimated at \$18.9 billion, accomplished by a combination of managed honey bees, wild honey bees and native bees. In 2000, native bees pollinated roughly \$3 billion worth of crops. With approximately 70 percent of the world's plants requiring a pollinator, naturally the wild bee is very busy.

As wildlife professionals talk more about tapping into the potential of the wild bee, resources are being set aside to achieve that goal. In 2000, about 4.5 million acres “retired” from farmland service by the Department of Agriculture’s Conservation Reserve Program was designated specifically for wildlife, all of which can help pollinators. Over the spring and summer of 2007, the Pollinator Protection Act and the Pollinator Habitat Protection Act of 2007 were introduced and incorporated into the Farm Bill. The Pollinator Protection Act calls for \$89 million for federal funding for research and grant programs at USDA over five years. Additionally, the Pollinator Habitat Protection Act will use existing Farm Bill conservation programs, such as the Environmental Quality Incentives Program or the Wildlife Habitat Incentive Program, to strengthen native and managed pollinator habitats. The Farm Bill provides aid for farmers and ranchers who want to help wildlife in other ways, such as reducing the use of toxic chemicals, emitting fewer pollutants, and reducing soil erosion, as well as creating wildlife structures and sowing a diversity of plants in conservation areas. The Conservation Security Program in the Farm Bill has also been designed to support contributions to stewardship and habitat and has specific practices, such as the nectar corridor enhancement, that may be used for pollinator conservation.

For instance, the primer reviews the impacts of managing cattle grazing, noting that overgrazing can harm pollinators by reducing floral and structural diversity of habitat by destroying forage flowers or host plants. The use of controlled fire is discussed both in regard to its positive value as a technique for wildlife management, but also as a potential detriment to habitat health if pollinators are not considered and their populations destroyed in the process. The costs and benefits of pesticide and herbicide use are also examined, noting how thorough planning can allow these tools to be used to control invasive species and restore native plant communities, without indirectly harming pollinators. “Herbicides can be an important tool for habitat management, but it’s a broad brush,” Vaughan says. He notes that wildlife managers need to be careful to use chemicals in ways that will limit harm to plants critical to the health of local pollinators and, in particular, should time and limit herbicide and pesticide applications to avoid periods when pollinators are active and seasons when blooms are present. According to Droege, woodland bees living east of the Rockies have plenty of habitat available to them as eastern forests mature and become protected; however, plants in meadows, wetlands, and other open areas have become sparse, over-browsed by deer, and

often not considered of the highest value to managers and the general public. “Yet our most uncommon and rare bees are almost always found in these very habitats,” he says. In general—depending on the geography and topography of the region—by creating diverse assemblages of forb-dominated and scrub habitats, restoring wetlands, establishing buffers around streams, and planting native wildflowers, wildlife managers can create a rich habitat for native bees.”

“Wildlife managers are trying to manage a landscape for the wildlife they’re interested in—whether birds, mammals or fish—and good habitat for them ultimately connects to good habitat for pollinators,” Vaughan says. “That’s the big hook. If you can provide this good habitat for bees, you end up providing a great habitat for wildlife.” ■

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