THE XERCES SOCIETY FOR INVERTEBRATE CONSERVATION

# Bumble Bee Conservation

## Protecting North America's Disappearing Pollinators

**Some of our most common and important bumble bees are disappearing across their ranges.**

**Pollinators are a vital part of a healthy environment.**

**Bumble bees are excellent pollinators of many crops and native plants.**

Photograph: Johanna James-Heinz

Bumble bees are in decline across North America. The rusty-patched bumble bee (*Bombus affinis*)—shown here foraging on wild bergamot (*Monarda fistulosa*)—is in particular peril.

In recent years, the story of vanishing bees has become a common theme in news reports and popular culture. In most cases these reports have focused on the disappearance of honey bees, a non-native species introduced to North America from Europe in the 17th Century. The larger, untold story is that other important native bees are also suffering, and in some cases their fates are far worse. This is particularly true of some of North America's nearly 50 native bumble bee species. Status reviews by the Xerces Society, in collaboration with bumble bee researchers across the continent, have established that at least four species of formerly common North American bumble bees have experienced catastrophic declines over the past decade – two of them may be on the brink of extinction. Preliminary investigations by many scientists indicate that a number of other formerly common species are also less abundant than they were in the past.

## Why Care About Our Native Bumble Bees

Bumble bees are keystone species in most terrestrial ecosystems, necessary not only for the reproduction of countless native wildflowers, but also creating the seeds and fruits that feed wildlife as diverse as songbirds and grizzly bears. Where bees disappear, the ecological impacts can be far ranging. For example in parts of Britain and the Netherlands, the abundance of insect pollinated plants has declined in areas where multiple bee species have been lost.

Bumble bees are also among our most important pollinators of high-value crops such as blueberries, cranberries, and clover and they are the exclusive insect pollinators of greenhouse tomatoes. Bumble bees are more effective pollinators that honey bees for some crops, in part because of their ability to "buzz pollinate." In the United States, the economic value of the pollination services provided by native insects (mostly bees) is estimated at $3 billion per year.

Written by
Sarina Jepsen, Eric Mader, and Scott Hoffman Black

**The Xerces Society for Invertebrate Conservation**

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## Important Pollinators at Risk

Among the bumble bee species that appear to be most critically at-risk are the rusty-patched bumble bee (*Bombus affinis*) and the yellow-banded bumble bee (*Bombus terricola*) in the Eastern U.S., and the western bumble bee (*Bombus occidentalis*) and Franklin's bumble bee (*Bombus franklini*) in the West. Once common across their respective ranges, these species are now absent from large portions of their historic ranges, despite concerted efforts find them.

The rusty-patched bumble bee formerly occurred from Maine to Georgia and west to Minnesota. Historically known from twenty states and two Canadian provinces, in recent years it has been found at only five locations. Similarly, in a 1995 survey of Wisconsin bumble bees, the yellow-banded bumble bee constituted 93% of all individuals observed in the northern part of the state. In follow-up surveys, it now represents less than 1% of the state's bumble bees. A similar decline of the western bumble bee has been documented, especially in the western part of its range. Franklin's bumble bee, not seen since 2006, may be extinct.

Evidence suggests that many other bumble bee species, including the American bumble bee (*Bombus pensylvanicus*), the yellow bumble bee (*Bombus fervidus*), the Sonoran bumble bee (*Bombus sonorus*) and the California bumble bee (*Bombus californicus*), have also declined from parts of their ranges, although the causes and the extent of the declines remain unknown. Many cuckoo bumble bees, which depend on other bumble bees for their survival, also seem to be declining, indicating a loss of their host species.

## Causes of Declines

The driving forces behind the decline of North American bumble bees are likely habitat loss, pesticide use, climate change, and perhaps most significant of all, the introduction of non-native bumble bee diseases.

Dr. Robbin Thorp, professor emeritus at the University of California Davis, hypothesizes that declines of the western, Franklin's, rusty-patched and yellow-banded bumble bees were caused by an exotic disease that spread from commercial bumble bee colonies to wild bumble bee populations. Research is underway to test this hypothesis.

The loss of habitat to development and agriculture is likely having a profound effect on all bumble bees. For example, native tallgrass prairie was considered ideal for bumble bees, yet over 99% of Midwest prairie has been lost to land conversion.

The few studies examining the impact of pesticides on native bees have consistently documented negative impacts. For example, in Eastern Canada where pesticides have been used by the timber industry to control forest insects, the disappearance of bumble bees near sprayed areas, and the corresponding decline in local blueberry harvests has been widely documented. Ground-nesting bumble bees are uniquely susceptible to pesticides that are used on lawns.

Climate change may already be disrupting the precisely timed relationships of plants and pollinators. Models predict that bumble bee ranges will shift in response to the changing climate. The ranges of cold-adapted species are expected to contract as populations move northward, whereas species that are adapted to warmer conditions are predicted to expand their ranges.

## What You Can Do

- Plant a diversity of native plants to provide bumble bee colonies season-long access to pollen and nectar. Use lupines, clovers, asters, bee balm and other mints, borage, and ericaceous plants such as blueberry and rhododendron.
- Avoid using insecticides, and use herbicides judiciously to protect flowering plants.
- Foster a natural landscape. Many species of bumble bees build their nests in abandoned rodent burrows or tussocks of grass. Preserve unmowed, brushy areas and tolerate bumble bee nests when you find them.
- Reduce soil tillage and mowing in areas where bumble bees might nest.
- Learn to identify bumble bees. If you spot a western, yellow-banded, or rusty-patched bumble bee, email photographs and location information to bumblebees@xerces.org. Identification guides to these species can be downloaded for free at www.xerces.org/bumblebees/.
- Support The Xerces Society and other conservation organizations working to protect bumble bees.

**For more information, visit: www.xerces.org/bumblebees**



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