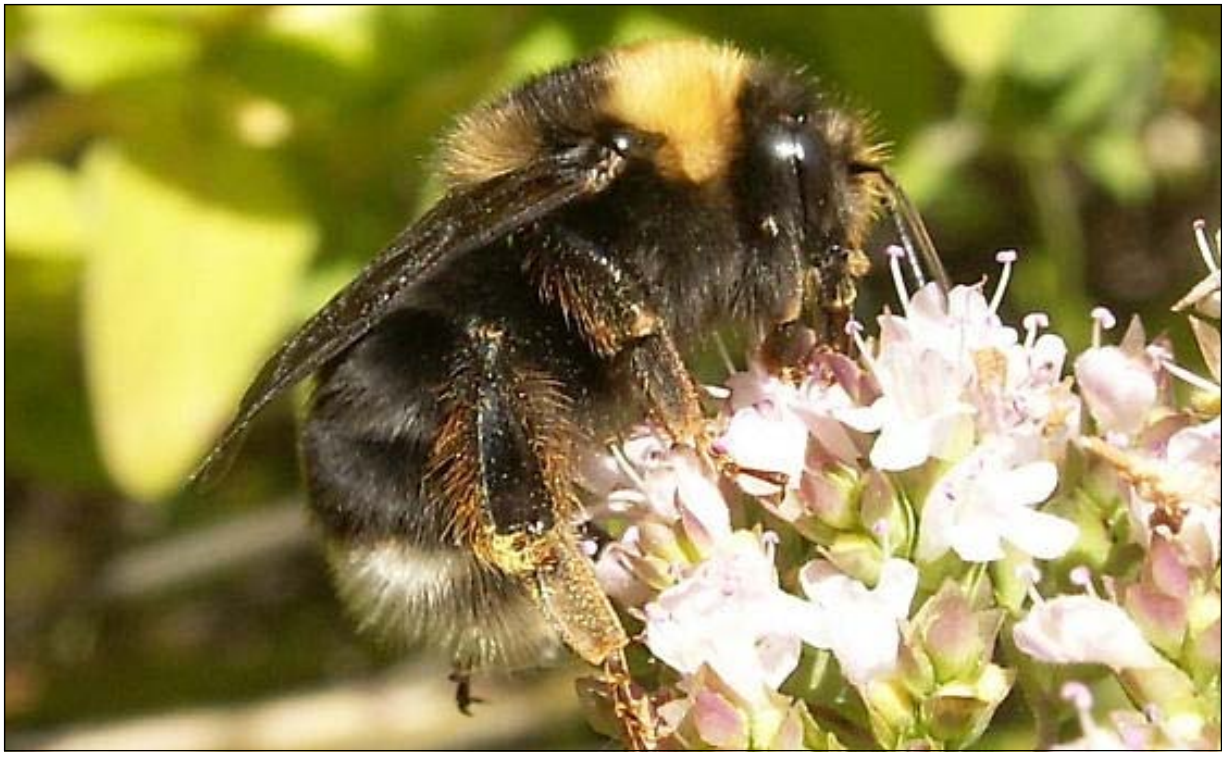
INVERTEBRATE CONSERVATION FACT SHEET

Bumble Bees in Decline

Pollinators are a vital part of a healthy environment.

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

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



Bumble bees are important pollinators of crops and wildflowers. Western bumble bee (© Derrick Ditchburn)

In 2007, the National Academy of Sciences reported losses in managed honey bee colonies and highlighted the fact that other native pollinators are experiencing declines. Indeed, bee taxonomists have begun to notice a reduction in the abundance and distribution of several bumble bee species, including many bumble bees that were formerly very common in North America. There are a number of threats facing bumble bees that may be leading to their decline, including disease, habitat destruction and alteration, pesticide use, invasive species, and climate change. Although the precise cause of the declines in North American bumble bees has yet to be proven, researchers such as Dr. Robbin Thorp suggest that the spread of disease and pathogens from the international transport of commercially reared bumble bees may be to blame for the declines in some species.

Importance of bumble bees as pollinators

Bumble bees are excellent crop pollinators and act as an insurance policy for farmers when honey bees are in short supply. In the U.S., the economic value of the pollination services provided by native insects (mostly bees) is estimated at $3 billion per year. Bumble bees are excellent crop pollinators. In some crops, such as cranberries and blueberries, bumble bees pollinate more effectively than honey bees, in part because they can fly in cooler temperatures and lower light levels. They also perform a behavior called “buzz pollination,” in which the bee grabs the pollen producing structure of the flower in her jaws and vibrates her wing muscles. This causes vibrations that dislodge pollen from the flower. This behavior is highly beneficial for the cross-pollination of tomatoes, peppers, cranberries, and blueberries. In tomatoes, buzz pollination by bees results in larger and more abundant fruit. Losses of bumble bees can have far ranging ecological impacts due to their role as pollinators. In Britain and the Netherlands, where multiple bumble bee and other bee species have gone extinct, there is evidence of a decline in the abundance of insect pollinated plants.

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Decline in Bumble Bees of the Subgenus *Bombus*

Bumble bee expert Dr. Robbin Thorp has hypothesized that wild populations of four closely related North American bumble bees—the Western Bumble Bee (*Bombus occidentalis*), the Rusty-patched Bumble Bee (*B. affinis*), the Yellow-banded Bumble Bee (*B. terricola*), and Franklin's Bumble Bee (*B. franklini*)—were infected with an introduced disease carried by commercially reared bumble bee colonies. In the early 1990's, Common Eastern (*B. impatiens*) and Western Bumble Bees were shipped to Europe and reared in the same facilities as the European Buff-tailed Bumble Bee (*B. terrestris*), then returned to the U.S. for use as commercial pollinators. Dr. Thorp suggests that, while in Europe, the Common Eastern and Western Bumble Bees were exposed to a pathogen of the European Buff-tailed Bumble Bee for which they had no prior resistance. Upon returning to the U.S., the Common Eastern and Western Bumble Bees may have spread a highly virulent disease to wild populations of bumble bees (that belong to the same group as the European Buff-tailed Bumble Bee—the subgenus *Bombus*). The close relationship of the bees in decline to the European Buff-tailed Bumble Bee, as well as the timing, speed and severity of the population crashes, suggest that an escaped exotic disease organism may be the cause of these widespread losses.

- The Yellow-banded Bumble Bee and the Rusty-patched Bumble Bee were once two of the most common bees in Northeastern and Midwestern North America, and now are absent in most parts of their former ranges. Both are excellent pollinators of wildflowers, cranberries, alfalfa, and a variety of other crops.
- The Western Bumble Bee was formerly widespread throughout western North America. It can still be found in some areas in the northern and eastern parts of its historic range, but the once common populations from southern British Columbia to central California have virtually disappeared. This bumble bee is an excellent pollinator of many crops, including alfalfa, avocado, apples, cherries, blackberries, blueberries, cranberries and tomatoes. It has been used commercially as a pollinator of both greenhouse tomatoes and cranberries.
- Another western species, Franklin's Bumble Bee, has not been found in recent years. This bee has the smallest range of any bumble bee, existing only in a small area in southern Oregon and northern California. This bee is a generalist forager on many types of wildflowers, including lupines and California poppies. Since 1998, Franklin's Bumble Bee populations have drastically declined and it may now be extinct.

Other Bumble Bees in Decline

A number of other bumble bees may also be experiencing losses, although more information is needed to determine the true status of each of these species. Most bumble bees are only monitored in a handful of locations, so it is difficult to determine whether a species is in decline throughout its range, or if a decline is merely local. Below is a list of species

- Declines have been noted in four bumble bees in the subgenus *Fervidobombus*: the American Bumble Bee (*B. pensylvanicus*), the Yellow Bumble Bee (*B. fervidus*), the Sonoran Bumble Bee (*B. sonorus*), and the California Bumble Bee (*B. californicus*), although healthy populations of each of these bees still exist in some areas. The American Bumble Bee is widely distributed across eastern North America west to South Dakota and south into eastern Mexico, and the Yellow Bumble Bee is abundant in the northeast, but can be found west to southeastern British Columbia and south to eastern California. Recent declines have been observed in southern Ontario for both of these species. The Sonoran Bumble Bee, which ranges from the Central Valley of California south and east to western Texas and Mexico, has disappeared from the Sacramento Valley. The California Bumble Bee is commonly distributed from British Columbia to Baja California, east to Idaho and Colorado, and it appears to be in decline in southern Oregon, northern California and the San Francisco Bay Area.
- The Ashton Cuckoo Bumble Bee (*B. ashtoni*), the Lemon Cuckoo Bumble Bee (*B. citrinus*), and the Insular Cuckoo Bumble Bee (*B. insularis*) all seem to have declined in recent years. Cuckoo bumble bees are dependent upon other bumble bees for their survival; losses of cuckoo bumble bees should serve as a warning that other bumble bees are disappearing. There is substantial evidence that the Ashton Cuckoo Bumble Bee, which depends on the Rusty-patched Bumble Bee and the Yellow-banded Bumble Bee, has disappeared throughout its range, whereas the Lemon Cuckoo Bumble Bee has declined in southern Ontario and the Insular Cuckoo Bumble Bee has declined in the San Francisco Bay Area.
- The Half-Black Bumble Bee (*B. vagans*) is known from eastern North America and appears to have declined in southern Ontario.
- The Red-belted Bumble Bee (*B. rufocinctus*), which is distributed across North America in southern Canada and northern United States, has declined in the San Francisco Bay Area.

For more information on bumblebees in decline, please visit www.xerces.org/bumblebees