

# Fact Sheet: Rusty-Patched Bumble Bee

Minnesota Interagency Pollinator Protection Team

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Since 2017, the rusty-patched bumble bee (*Bombus affinis*) has been listed as endangered under the U.S. Endangered Species Act. In 2019, this species became Minnesota's state bee (Minnesota Statutes Chapter 1, Section 1.1465). This designation has the purpose of raising awareness about the role and importance of native wild pollinators to Minnesota's environment and economy.

## Distribution

The rusty-patched bumble bee (RPBB) used to be widely distributed across the Canadian provinces of Quebec and Ontario, along the east coast of the U.S. from Maine to Georgia, and as far west as eastern North Dakota. Reports indicate that RPBB populations started to decline in the late 1990s (Szymanski J., 2016). The once common species now occupies 0.1% of its historical range (USFWS, 2020). In Minnesota, RPBB has been found recently as far north as Bemidji, south to the Iowa border, with many sightings in the Twin Cities metro area.

## Life History

RPBB colonies consist of a queen, female workers, and males and can vary in size from 50 to around 1,000 bees. Unlike honey bees, whose colonies can last years and have thousands of individuals, RPBB colonies follow an annual life cycle. Only queens overwinter, which means that every spring, a single queen is responsible for starting a new colony by herself. She forages for food, defends her nest, and tends to her young until new bumble bee workers mature and are ready to take over her duties. During late summer, new queens and males grow and mate. When winter comes, only mated queens overwinter under the soil and the rest of the colony, including the old queen, die.

## Description

There are physical differences between queens, males, and worker RPBB (Figure 1). Workers and males present the characteristic "rusty patch" on the top edge of the second abdominal segment, the first segment and the rest of the second segment are yellow, and the rest of the abdomen is black. Queens do not have the rusty patch, both first and second abdominal segments are yellow, the rest are black. Additionally, workers and male RPBB have their thorax covered in yellow hairs with a T-shape area of black hairs, called the "thumb-tack", queens do not have a thumb-tack (BeeLab, 2020).



**Figure 1.** Queen, worker, and male rusty-patched bumble bees. (Illustration by Dr. Elaine Evans, Bee Lab, University of Minnesota).

### Feeding Habits

RPBB feeds on a wide range of plants. From spring to fall, RPBB colonies need a constant and diverse supply of pollen and nectar.

### FAQ

#### Why is the rusty-patched bumble bee endangered?

Native pollinators, including the rusty-patched bumble bee, are threatened by several factors:

1. Loss and fragmentation of their natural habitat. With the increase of urbanization and agricultural intensification, there are fewer food resources and nesting sites for bees. Monocultures of turf in cities and monocultures in rural areas can be food deserts to pollinators.
2. Pesticides. Pesticides can harm pollinator populations. While not the only tool for pest control, pesticides are used in food production, protection of human health, or controlling invasive species. It is important to reduce the exposure of bees and other pollinators to insecticides and fungicides.
3. Diseases and parasites. The commercial production of bumble bees and management of honey bees to provide pollination services may have introduced foreign pathogens and parasites to native bee populations.
4. Climate change. As temperatures across the globe change, extreme weather events connected with climate change such as flooding, drought, and fires directly harm pollinators. There have been reports of disruptions between bee emergence and flower blooms, reducing food availability and pollination services. For example, after warmer winters, some spring flowers will start blooming early, and by the time RPBB queens emerge, there will be fewer flowers available, meaning that bees miss out on food and flowers miss out on pollination (Kehrberger et al 2019). Many pollinators have had to move to new areas to stay within the temperature ranges they need for survival. Another effect can be seen in false “springs,” which wake bees up earlier only to be killed by lower temperatures later on (Harrington, 2018).

These four factors interact and amplify the effect of each one on its own. For example, poor nutrition due to habitat loss can make bees are more susceptible to negative effects of diseases and pesticides. In addition, habitat loss reduces the ability of pollinators to move when areas become unsuitable due to climate change.

## What can we do to help?

- You can help the rusty-patched bumble bee and pollinators in general by planting a pollinator garden. Even small spaces can make a big difference. The Board of Water and Soil Resources (BWSR) created great [resources](#) to guide you through this process.
  - Say goodbye to unnecessary lawn areas and start integrating pollinator habitat in your home landscaping. Prioritize the use of native plants, which are better for native pollinators and the environment. Once established, native plants need less water and maintenance than turfgrass. Installing pollinator plantings and bee-friendly lawns can be an important step toward a more sustainable garden.
- Support the creation of natural areas in your neighborhood, city, and state. This may benefit pollinators and other wildlife. Native plant communities [can improve water and soil quality](#).
- Reduce pesticide use in gardens and backyards. Adopt an integrated pest management (IPM) approach to control pests in your garden. The Minnesota Department of Agriculture has developed [best management practices](#) for pesticide use in gardens and urban landscapes.
- Get involved in citizen science monitoring programs like the Bumble Bee Watch, and iNaturalist. Help scientists figure out the status of important native wild bees and butterflies in the State.
- Tell your friends, neighbors and co-workers about the importance of pollinators and the simple steps they can take to help.

## Fun facts

- There are about 250 species of bumble bees in the world!
- RPBB queens may build their nests in cavities above and belowground. They try to find cavities already formed, like abandoned rodent burrows and bird nests! (Plath 1922, pp. 190–191; Macfarlane et al. 1994, p. 4).
- In the U.S., the RPBB is the first bumble bee to be federally listed as an endangered species.
- Bumble bees are particularly adept at pollinating tomatoes, cranberries, blueberries, and other plants with specialized anthers due to their ability to rapidly vibrate their wing muscles to dislodge pollen. This is known as buzz pollination or sonication. Ground cherries (*Physalis* sp.) are one example of a Minnesota native that requires buzz pollination!

## References

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