

## **Creature Feature: Summer 2015**

By W. Scott Douglas

### **Bumble Bees (*Bombus*)**

When I was a kid, we used to challenge each other to “pet” bumblebees. While this seemed like a dangerous sport, it really came with little risk, since bumblebees rarely use their stingers except in defense of their nests. A recent article on bumble decline in Audubon magazine directed me to the Xerces Society, an organization dedicated to the preservation of invertebrates, and their excellent handbook: “Conserving Bumble Bees, Guidelines for Creating and Managing Habitat for America’s Declining Pollinators” which you can find at [www.xerces.org](http://www.xerces.org). I summarize just a little of that information here.



These gentle giants of the bee family are more than curiosities; they are a keystone species of most northern and high elevation ecosystems, often the most important pollinators in these habitats. This is due to the fact that their “fur”, actually long bristles, allows bumblebees to retain the body heat generated by their large flight muscles. They can fly at temperatures as low as the 50s, making them important pollinators in early spring and late fall as well as the northern, even arctic, climates. But

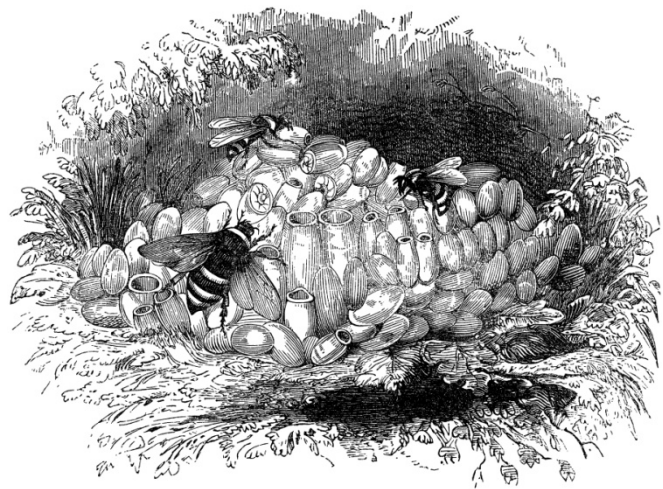
all is not well with our 50 North American species of the genus *Bombus*; habitat loss, invasive species, introduced parasites, loss of native flowers due to overgrazing and development, as well as use of pesticides has actually brought two species to near extinction. Given that the honey bee, an introduced species, is in decline due to colony collapse disorder, we need to learn more about how to help the humble bumble, or risk the loss of many iconic wildflowers and the wildlife they support. It is estimated that 85% of the world’s flowering plants are pollinated by animals, mostly bees. The economic value of bumblebee pollination is estimated at hundreds of billions of dollars a year.

There are 50 species of bumblebees in North America, and 8 in Pennsylvania. Most are black with yellow, white and even rusty stripes. They live in colonies in or on the ground, with 50-500 animals each. Like the honey bee, they are social, and have a single queen which founds the nest and lays all the eggs. The queens emerge from shallow depressions in soft ground in the spring and search out cavities under rocks, abandoned rodent holes, old bird nests or in buildings for establishing nests. She makes pots out of wax that they

secrete from glands on their bodies and use these pots to store honey and pollen for food. It takes 4-5 weeks for the first eggs to hatch and grow to maturity. After this, the queen focuses on laying more eggs and the workers care for her and their sisters. Workers travel anywhere from a thousand feet to a ½ mile from the nest to gather food. Nectar is lapped from flowers using their proboscis, much like butterflies do. Pollen collects on their fur as they visit the flowers and the bees comb it from their fur and place it in pollen baskets on their hind legs. Of course, this action is what pollinates the flowers. In the fall, the queen starts laying eggs for new queens and the males, called drones. The males fly off to find mates, and the queens stay in the home nest until they mate. At the end of the season, the nest is abandoned and the young queens fly off to find overwintering sites. The foundress does not survive the winter. Skunks, badgers, raccoons, robber flies, bee hawks, crab spiders, and shrikes prey on bumblebees.

Modern agriculture has not been friendly to the bumblebee. Tilling, monoculture, and pesticides have all taken a toll by removing natives, destroying nest sites, and reducing fitness. Modern systemic pesticides are particularly bad because they build up in the nectar and pollen, which is then taken to the nest and further concentrated. The new neonicotinoid pesticides (clothianidin, imidacloprid, and thiamethoxam), while considered to be much safer than the old chlorinated hydrocarbon pesticides (like DDT), are particularly bad for bumblebees. This is because these chemicals alter the number of queens that the colony produces. Scientists are still trying to figure out why this is so. Suffice it to say that home pesticide use is discouraged in all cases; the risks greatly outweigh the benefits. I have yet to use any pesticides at my home, with the exception of spot removal of hornets and only then if they built large nests in high traffic areas. I always found it easier and safer to teach my children to avoid them.

Another major impact to the bumblebee stems from an attempt to domesticate them for agricultural use. Colonies of the western bumblebee were collected and shipped to Europe for a captive breeding program to raise them for use in commercial greenhouses. Unfortunately, these colonies came back infected with a European parasite that has managed to escape to wild colonies and is causing a rapid decline of this and other species. The Franklin's bumblebee and the Rusty-patch bumblebee are likely extinct, or close to extinct in the western US because of this invasive parasite.



There is actually a lot you can do to encourage bumblebees on your property. Queens seek out compost piles, small brush piles, rock walls and gardens, and even upside down flower pots, as well as rodent holes in which to nest. Keeping some areas of your property unmowed, and parts of your garden untilled until late spring, will encourage native flowers as well as provide nesting and overwintering sites. There are lots of plans for bee boxes out on the internet, and they are a great project to share with your kids. You can even build

nest boxes with plexiglass windows that allow you and your young helpers to observe the bees. Planting native flowers, especially ones that bloom in early spring and late fall when the colony needs extra food, is particularly beneficial. Consider seeding one of your gardens, or a strip of lawn, with native grasses and wildflowers. They are beautiful and require very little care. Flowers like New England Aster, Blue Hyssop, Goldenrod, Beebalm, Mountain mint and Dutchman's breeches are great choices, as are clovers, lavender and lupines. Bumblebees show a preference for blue, purple and yellow flowers. Teach your children to cherish, not fear, the humble bumblebee. After all, the wise and gentle headmaster of Hogwarts is actually named after the old English word for bumblebee, so how bad can they bee?