

Expert Pollinators

Insects such as bees, butterflies, moths, beetles, flies, and wasps visit flowers seeking food in the form of sugary nectar or protein-packed pollen grains—or, in the case of bees, both. As they forage, they transfer pollen grains between blooms, enabling the plants to reproduce.

Bees are particularly efficient and important pollinators. Whereas other insects visit a flower to feed, female bees collect pollen as food for their offspring and, consequently, carry a great deal of pollen as they fly between blooms. They carry pollen in special structures, called a pollen brush or pollen basket, and some of it brushes off as they visit flower after flower—a hundred or more in a foraging trip—which results in pollination.



Bumble bees (genus *Bombus*) visit a wide variety of flowers, and are a familiar sight in roadsides, farms, gardens, and prairie.

(Photograph © Betsy Betros)

Nearly 85 percent of flowering plants around the world rely on bees and other pollinators to reproduce. In fact, more than two-thirds of crop species—crops that produce fruits, vegetables, spices, nuts, seeds, and livestock forage—depend on them.



Squash bees (genus *Peponapis*) live their entire lives around squash plants. Females will nest in the ground below squash plants and the males, because they do not have a nest to return to at night, will often be found sleeping inside the flowers, like these two to the right.

(Photograph by Nancy Adamson, The Xerces Society)



To reach the nectar in apple blossoms, mining bees (genus *Andrena*) clamber over the pollen-producing stamens, making them highly effective pollinators. Other species of bees will walk on the petals to reach the nectar, making limited contact with pollen.

(Photograph by Nancy Adamson, The Xerces Society)

What's the Buzz?

Native bees have a skill honey bees lack: they can vibrate the pollen out of the blossoms, a technique called buzz pollination. Bumble bees are particularly adept at this. As a result they are key pollinators of crops like blueberries and tomatoes and wildflowers such as shooting stars (*Dodecatheon*).

Several species of native bees, like this solitary mining bee (genus *Andrena*), shake pollen from blueberry flowers by wrapping themselves around the bloom and vibrating their flight muscles.

(Photograph by Nancy Adamson, The Xerces Society)

The rusty patched bumble bee (*Bombus affinis*) is one of America's most endangered bumble bees. Once common from North Dakota to the Atlantic, it is now found at only a few scattered sites.

(Photograph by Rich Hatfield, The Xerces Society)

Roadside vegetation can provide much needed habitat for bees, providing food, nesting habitat, and connections to other patches of habitat. With more than 75 percent of Iowa's land allocated to agricultural production, roadside habitat is especially important to the state's wildlife.

It might seem strange, but fewer bees or butterflies are killed on roads that have flowers growing beside them. Because there is lots to eat on the roadside, pollinators there rather than going in search of food elsewhere.

(Photograph by Iowa LRTF)



A leafcutter bee carries dry pollen grains trapped between stiff hairs on her abdomen, showing here as a yellow fringe.

(Photograph © Bryan E. Reynolds)

BEES

Meet the Bees

At least 3,600 species of native bees call the U.S. their home, with nearly 300 species—and counting!—found in Iowa. There are also several species of bees that have been introduced, of which the honey bee (*Apis mellifera*), a domesticated species introduced from Europe, is most familiar. Honey bees are managed by beekeepers to provide crop pollination services as well as honey production. Honey bees live in large colonies of 20,000 individuals or more that work cooperatively. For example, the role of the queen bee within each hive is to reproduce, while her worker bees divide up duties to maintain the hive and feed the colony.



Honey bees are very unusual bees. Few other species live in such huge colonies with organized workers performing separate jobs or produce and store honey.

(Photograph by Waugsberg, Wikimedia Commons/CC3.0 BY-SA)

Nest Preferences

The nesting habits of North America's native bees are very different from honey bees. Most native bees live solitary lives, with each female working alone to build her small nest and collect and provide food for her offspring. Some solitary bees visit a diversity of flowers, others a particular species. Many bees in the Midwest nest underground, digging slender tunnels off which they build cells for each egg and its provisions. Other bees nest in cavities, chewing into the pithy center of stems, or nest in existing holes, sometimes man-made.



Mining bees (genus *Andrena*) are among the thousands of species that nest in the ground. Each female digs a narrow tunnel, off which she creates a series of brood cells. She provisions each cell with nectar and pollen and lays an egg. Their nests appear in spring, frequently with a mound of excavated soil around the entrance. If you watch carefully, you will be rewarded by a glimpse of the bee leaving her nest.

(Photograph by Whitney Cranshaw, Colorado State University, Bugwood.org)



Species such as small carpenter bees (genus *Ceratina*) chew a nest tunnel into raspberry canes and other plants with twigs that have soft, pithy centers.

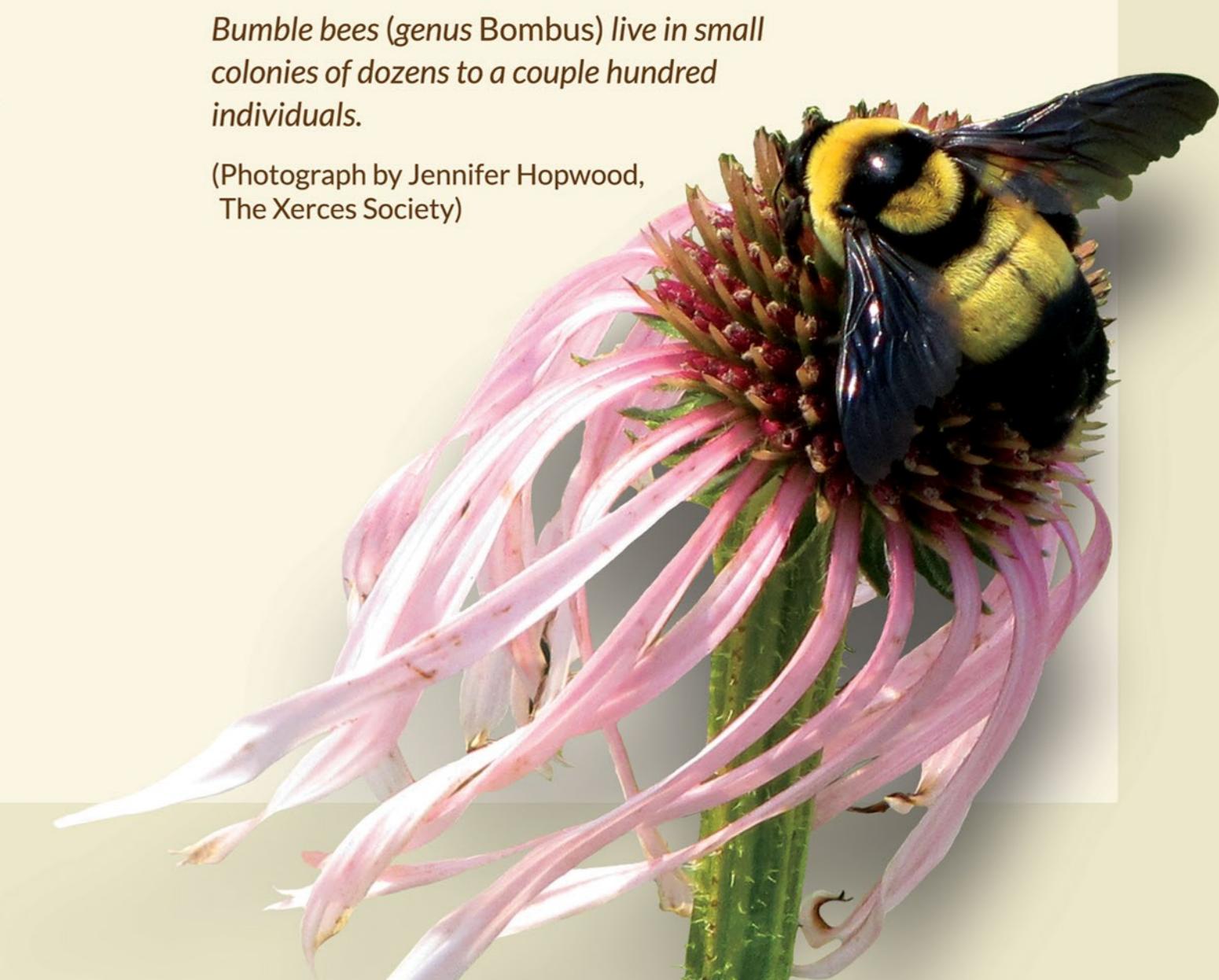
(Photograph by Jennifer Hopwood, The Xerces Society)

Bumble bees and some sweat bees are the only native bees that form social colonies. Their colonies are much smaller than a honey bee hive, usually fewer than two hundred bees. Bumble bees tend to nest under clumps of bunch grass or in old rodent nests (two things that can be found on roadsides).



Bumble bees (genus *Bombus*) live in small colonies of dozens to a couple hundred individuals.

(Photograph by Jennifer Hopwood, The Xerces Society)



THE VALUE OF ROADSIDES

Flowering plants along roadsides are important sources of nectar and pollen for bees, both those that spend their entire life within the roadside and those that reproduce or overwinter elsewhere. The best roadsides for bees include a diversity of native flowers with a succession of bloom throughout the growing season.

Practices such as Integrated Roadside Vegetation Management (IRVM) can benefit pollinators and their habitat while meeting the functional requirements of roadside vegetation. IRVM is a management system that promotes the use of hardy and adapted native grasses and wildflowers in combination with practices such as mowing, burning, and the targeted use of herbicides to control weeds. Due to their extensive root systems, native plants help improve water quality and provide excellent erosion control benefits.



Not all bees have yellow stripes. Bees are a highly diverse group of insects and may be black or brown with stripes of yellow, white, or orange, or have bodies that are red or glossy blue or, in the case of this green sweat bee (genus *Augochloropsis*), metallic green flecked with gold.

(Photograph © Bryan Reynolds)

The Iowa Living Roadway Trust Fund

The Iowa Living Roadway Trust Fund (LRTF) was established by the Iowa General Assembly in 1989 and is administered by the Iowa Department of Transportation. Through grants to county, city, and state agencies, the LRTF's mission is to provide assistance to implement IRVM. The Iowa Department of Transportation, with support from the Living Roadway Trust Fund, has planted more than 100,000 acres of state and county road rights-of-way with native plants.

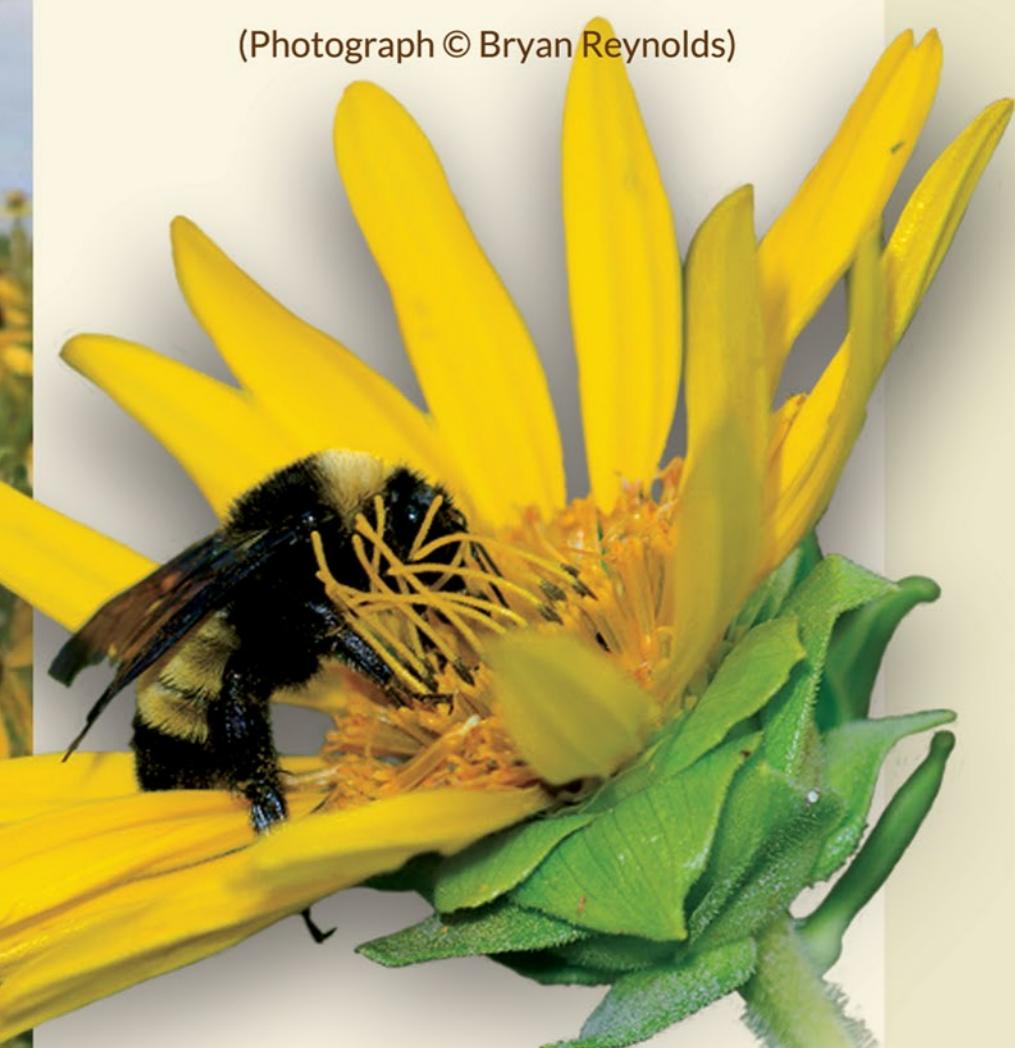


When thoughtfully planned and carefully maintained, Iowa's roadsides can be alive with wildflowers, giving important food and shelter to the state's bees.

(Photograph by Iowa LRTF)

Several species of bumble bees are becoming increasingly rare, including the American bumble bee (*Bombus pensylvanicus*), shown here. Roadside flowers provide them with nectar and pollen.

(Photograph © Bryan Reynolds)



Bees need our help

Many bumble bee species, as well as colonies of managed honey bees, are experiencing declines due to a loss of habitat, the spread of disease, overuse of pesticides, and various other factors. Declines of bees may impact agricultural yields and put the health of natural ecosystems at risk.

Four Things to Help Bees

- Plant native flowers
- Provide habitat for nest sites
- Protect from insecticides
- Reduce mowing and herbicide use in road ditches in front of your property

For more information, visit www.BringBackThePollinators.org.

