

Native plant gardeners with keen observation skills have surely noticed the increase in flower-visiting insects in their gardens. Fascinating visitation patterns emerge from one growing season to the next such as the same type of bee consistently foraging on a particular native plant. About 15 years ago, while installing and tending native landscapes, I started to notice these patterns and the astounding diversity of insects the native flowering plants attracted compared to traditional gardens filled with exotic plants. Since I always had an interest in entomology, it didn't take much for me to become enthralled with bees, to create a desire to learn more about these amazing insects, and to begin a fascinating journey educating others about their importance and connection to native plants.

If you are on a similar journey or have an interest in learning more about bees, the good news is that North America has an outstanding number and diversity of bees. There are about 3,600 species of bees in the United States and about 740 species in Canada, including bees of varying sizes, seasonality, tongue lengths, foraging behaviors, abilities and preferred habitats. Some species are sand-obligate, nesting in sandy sites in existing or ancient dunes or shorelines; a minority are dependent on forests, foraging on the first delicate plants that bloom in spring or seeking nesting sites in wood cavities. Interestingly, some are pollen-collecting specialists (oligolectic), relying on pollen sources for their offspring from a single plant family such as Asteraceae, or more narrowly, a single plant genus such as *Salix* (willow). This reliance on a narrow diet derived from native plants is one of many reasons native plants are critical for the more than 4,300 species of native bees that occur in the U.S. and Canada.

In the last five years, extensive coverage in the media has centered on the plight of pollinators, specifically the European honey bee, *Apis mellifera*. Journalists have written much about this bee and its problems — pathogens, disease, pesticide exposure and other stressors that combined have severely impacted their immune system, health and hive survival. Introduced into North America in the early 1600s, humans have domesticated this industrialized bee for thousands of years. With the attention solely focused on the honey bee, it has become the template for people's understanding of how bees behave (forage), live (colonies or hives), contribute resources for human consumption (wax, honey), and provide some of the ecosystem services (pollination) that humans depend upon. However, this one-bee media coverage is based largely upon economic concerns and not conservation concerns. Hive losses cost beekeepers money and time to replenish their stock. Our current way of growing food in large, conventional monocultures means that the impact on the health and seasonal population fluctuations of honey bees will continue. Unless we change the way we grow food and provide habitat for honey bees — and native bees — this trend of hive losses for beekeepers will continue.

What about native bees?

Despite the importance of native bees, they do not dominate the discussion of bees in the media; in fact, little is heard about the diversity or lifestyles of native bees. Native bees pollinate many of the food crops humans consume and in many instances, are more efficient at pollination than honey bees. Native bees have coevolved with native plants forming critical interdependent relationships, helping to pollinate and maintain diverse, thriving native plant communities. There is still much work ahead to educate the public about native bees. With the spotlight on honey bees, attention is diverted from native bees and one well-meaning, but misdirected, result is the formation of citizen advocacy groups whose mission is to “save the bees.”

SAVING OUR BEEES



However, they focus on saving honey bees, and this dominant message has prompted one-sided responses:

- Individuals introducing a hive of honey bees in their backyard.
- Citizen groups advocating for municipalities to adopt bee-friendly practices while changing ordinances so residents can keep honey bees in their backyards.
- Nature centers installing hives on their property to teach the public about bees. School children on a class trip to these nature centers learn about honey bees rather than native bees, their connection to native plants and *nature*.
- Local, state, and federal conservation organizations joining the “plight of pollinators” bandwagon highlight honey bees in their literature or on their websites.
- A presidential memorandum is issued with honey bees, monarch butterflies and pollinator habitat as its three main goals.
- Corporations or non-profit organizations allowing hives on their campus or rooftops as a public relations campaign to show their support for bees.
- Bee or pollinator-friendly articles or books featuring photos of honey bees.

Contrary to reports in the media, honey bees are not at risk of extinction, and they don't need saving. The most recent estimate is that their population has increased 45 percent worldwide in the last 50 years. Humans have distributed this industrialized bee globally to every continent except Antarctica.



SOME MYTHS AND

As Sheila Colla and J. Scott MacIvor wrote in their 2016 article, *Questioning public perception, conservation policy, and recovery actions for honeybees in North America*, “Honey bee losses are not a conservation problem, but instead a domesticated animal management issue.” Many of the issues they face stem from their intense domestication and stressors put upon them while being transported great distances to pollinate monocultures of crops, being exposed to pesticides, or from the nutritionally poor, inadequate habitat provided for the bees. The average percentage of yearly losses of colonies is around 24 percent for commercial beekeepers with more than 500 hives and 44 percent for backyard beekeepers, according to the [Bee Informed Partnership](#). The

LEFT: A female cellophane bee, *Colletes* sp., perches at the entrance of her nest in the ground.



RIGHT: A cuckoo bee, *Sphecodes* sp., lays its eggs in the nests of ground-nesting bees rather than constructing or provisioning its own nest.

economically acceptable winter loss for commercial beekeepers is 15 percent, and if exceeded then investments in hive replacements are required. The contrast is that honey bee threats manifest as measurable monetary loss (economic), whereas native bee threats are environmental in nature (habitat loss, climate change and pesticides) and loss is more difficult to quantify. For bumble bees, another contributing factor believed to be responsible for the decline of four species is pathogen spillover from commercial bumble bee colonies to wild populations. One of those species affected, *Bombus affinis*, the rusty patched bumble bee, has seen its historic range contract 75 percent. Hopefully, the bee will be added to the federal endangered species list in late March 2017, pending approval from the Trump administration. *Bombus franklini*, Franklin’s bumble bee, native to the Pacific Northwest, is believed to be extinct since it hasn’t been documented since 2006.

Secondly, because honey bees do not need to be saved from extinction, these responses pose problems from a conservation, biodiversity and ecological standpoint. First, honey bees have very different lifestyles compared to native bees. It’s like comparing a domesticated animal with a wild animal of the same family or genus, such as a dog vs. a wolf or a chicken vs. a chickadee. Just like these examples, there are striking differences between the European honey bee and native bees. The majority of native bees do not live in colonies; most construct solitary nests below ground in burrows or above

ground in cavities. They depend on natural landscapes that provide adequate forage and nesting opportunities. Any major disturbance in a landscape managed by humans can impact existing or potential nesting sites of native bees.

Another misguided response is the recommendations put forth for what plants (bee forage) to plant for bees. Many bee advocacy groups focused on “saving” the European honey bee promote the use of nonnative and even invasive plants because they are cited as being “good for bees.” One example of this thinking that comes up often is that dandelions, a plant introduced from Europe, are good for bees because it is the only plant that flowers in early spring. Native bees have survived on this continent for thousands of years without

A pure green metallic sweat bee, *Augochlora pura*, forages near woodlands where it nests in cavities in rotting wood.



dandelions and have found an adequate amount of forage from native plants such as willows, red maple, currants and gooseberries, as well as early flowering woodland wildflowers. Dandelions are an attractive nectar source for bees, but the pollen has a low 15 percent protein content, a nutritionally inadequate food source for alien and native bees to provide for their larvae. In contrast, pollen from native pussy willow, *Salix discolor*, has a 40 percent protein content. Other “plant these for the bees” posters or memes include creeping charlie, birdsfoot trefoil, barberry and Siberian pea shrub, many of which are considered noxious weeds or invasive. Besides planting potentially invasive plants for bees, another concern raised about alien bee species is that they may contribute to the pollination of existing invasive plants, some of the very plants that the introduced or alien bee coevolved with on another continent. With the potential of an increase in the pollination of invasive plants resulting in more seed produced, there is an increased risk of these plants outcompeting native plants, putting further pressure on native bee species already existing in highly fragmented landscapes lacking a diversity of flowering plants.

Lastly, there is growing evidence presented in peer-reviewed journals that honey bees compete for resources with native bees. One hive of honey bees can contain between 10,000-50,000 bees, and honey bees can forage 2 to 4 miles in any direction from a hive collecting resources over an area of land that contains many native bee nests. In contrast, native bees have limited foraging ranges, 200 yards to 1 mile. Measuring the competition for resources has been very difficult for researchers since finding nests and quantifying competition at flowers is challenging, but one recently published paper by James Cane and Vincent Tepedino, *Gauging the effect of honey*

MISUNDERSTANDINGS

bee pollen collection on native bee communities, approached the problem from a different direction. Instead, they looked at the quantity of floral resources collected by one honey bee colony and compared that to the quantity of resources collected by a solitary bee. Their results were that one hive of honey bees in three months collects the equivalent quantity of forage 100,000 solitary bees would collect. The implications of these results may mean that for every hive introduced by well-intentioned people who want to “save the bees,” the negative impact on native bee populations is potentially quite significant. In urban/suburban areas there has been a significant increase in the number of hives introduced, as more municipalities are adopting bee-friendly ordinances allowing hives in residential backyards. These

estimate is at least one acre of flowering plants per hive — an amount that one urban or suburban backyard cannot support. In contrast, farm animals would be provided food but these domesticated animals are confined to farms by fences, so they likely pose a minimal threat to wild populations of animals or birds. Honey bees are different and unique; they forage outside the boundaries of the farm (or backyard) to find their food. Forgoing the responsibility of providing an adequate amount of forage for the number of bees that are kept may put further pressure on wild populations, especially if numerous hives are stationed in one place for summering. This prompts a much-needed consideration for municipalities and advocacy groups that both alien and native bee species have enough forage available. Fortunately, with



LEFT: A female long-horned bee, *Melissodes* sp. visiting a compass plant, *Silphium laciniatum* flower.

RIGHT: A hairy banded mining bee, *Andrena hirticincta* is a specialist of goldenrod and aster species.

built environments that include flower-rich gardens have been found to be very good at supporting common, but diverse, native bee populations. So the negative impact from competition in habitats such as these supporting diverse native bee populations is potentially significant. Honey bees may not be pollinator-friendly at all if these metrics only represent a rough estimate of their potential to deplete limited resources that native bees depend upon.

With habitat loss being one of the main contributors to the decline of native bee species, it is more important than ever to protect or restore the native landscapes that these bees depend upon, including habitat in agricultural fields; local, state, or federal land; and other conservation land. While we can support a diversity of common bee species in our flower-rich residential landscapes including the hopefully soon-to-be endangered rusty patched bumble bee, *Bombus affinis*, it's the large, natural parcels of land that support both rare plants and bee species. Public land managers can be pressured by beekeepers to allow them to place their hives without restrictions on these large tracts of land to forage for the summer months. This is one reason Cane and Tepedino published their paper: “Such a metric is needed by public land managers confronting migratory beekeeper demands for insecticide-free, convenient, resource-rich habitats for summering.” Colla and MacIvor also raised this concern and expressed the need for environmental impact assessments and monitoring of native bee populations before the introduction of hives in large, natural areas.

There is no requirement for beekeepers to provide forage for their bees and it takes an abundance of flowering plants to provide enough food for one hive of honey bees. One

the media covering honey bees, there are many efforts underway to create more habitat, and many beekeeping groups are part of this solution because they realize they need to provide pesticide-free, nutritionally rich plants for their bees. It is important to note, however, while there is overlap in forage for honey bees and native bees, honey bees also need nonnative plants to meet their nutritional requirements.

The journey continues with a call to action. Education about native bees and the habitat they require is critical in order to balance the current lopsided information and media coverage. The knowledge gap is wide, but Wild Ones members and conservationists can help bridge this gap and ensure that the focus is environmental, supports biodiversity, and is not just based on economic concerns of one domesticated species. Let's decrease the pressure on all bees by advocating for, creating, restoring and enhancing habitat for bees, *first and foremost*. This can be accomplished with the strategic placement of hives in landscapes *adequately planted* to support the hives, protecting diverse native bee populations from competition for resources in both built and natural landscapes, and advocating for and supporting more research of native bee populations and environmental impact assessments of landscapes before hives are introduced. 🌸

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