

GARDENING WITH WILDLIFE

To Save Native Bees, Nurture Their Earthen Homes

by Nancy Lawson

To successfully grow plants, we can tap into abundant resources for information about their preferred soils, rainfall, and other conditions. But where do we go to find information about nurturing some of their most important pollinators?

That question is top of mind for scientists studying a little-known but critical group of insects: the solitary native bees nesting beneath our feet.

“One of the big challenges is that these bees spend 80 or 90 percent of their life cycles below ground,” says Alexandra Harmon-Threatt, an associate professor of entomology at the University of Illinois. “And we just have no real way of tracking the really important sensitive stages of those life cycles once they’re down there. ... The soil is literally a black box.”

In a review of papers on native bees, Harmon-Threatt found nesting information for only 26 percent of the species investigated. Exacerbating the dearth of knowledge are persistent misconceptions about which bees are really at risk. As the global trend of introducing hives of nonnative honeybees to “save the bees” continues unabated, an increasing body of research is revealing honeybees’ potential to transmit disease to native bees and usurp their floral resources. The world’s 20,000 other bee species, particularly the 70 to 80 percent who are ground nesters, don’t just have an image problem, they have barely any public image at all.

Even in circles where there’s an awareness of native bees, “the conversation is always about floral resources,” says Cornell University entomology professor Bryan Danforth. “It’s ‘we need to plant more wildflowers, more pollinator-friendly gardens.’ And that’s great. That’s really important. But what’s missing is this idea that nesting sites are really high-priority conservation sites.”

GROWING A MOVEMENT

Enter Project GNbee (gnbee.org), a community science initiative begun in Danforth’s lab that aims to identify where different types of bees are nesting, which conditions they prefer, and how to protect and replicate those habitats. By enlisting bee ambassadors to find and monitor nesting sites and take soil samples, research scientist Jordan Kueneman hopes to help people “think

ny ground-nesters—including species of cellophane bees, mining bees, sweat bees, and long-horned bees—choose spots near each other, sometimes reaching astounding numbers in what Kueneman calls “super sites.”

No one knows the potential limits of these aggregations, but the Danforth lab has been watching an estimated 5.25 million mining bees (*Andrena regularis*) emerge each spring at a nearby cemetery.



A *Melissodes communis* bee emerges from its nest in Laura Langlois Zurro's Florida garden.

about conserving them and realize what they need before we lose them.”

So far the project’s iNaturalist page has collected more than 5,000 observations from as nearby as Ithaca, New York, to as far away as Madagascar. People find nesting sites along trails, in schoolyards, on baseball diamonds, at outdoor cafes and—most often—in their yards. Though most native bees are solitary, excavating nests by themselves and laying a small number of eggs, ma-

These bees are the most prolific pollinators of the university’s apple trees, where native bees have made honeybee hives obsolete. Though Danforth had long wondered where all the orchard’s mining bees were nesting, they flew under his radar until a member of his lab saw them while parking near the cemetery.

GROWING BEES IN THE GARDEN

The discovery vividly illustrates the difficulty of tracking down nests, even for sci-



While many native bees are solitary, cellophane bees (*Colletes* spp.) nest near each other, excavating mounds that look similar to anthills.

entists. But a few seasonal clues can help anyone become a more astute bee observer. Aggregations often look like anthills, with mounds of excavated soil above them. Males tend to emerge first, zipping around in search of mates. Females hover when looking for nest sites and circle around to

remember visual landmarks. The frenzied activity may be disconcerting to some people, but males don't sting and females are very unlikely to do so, given that they have no hive to defend.

Ground-nesting bees tend to go for sandy soil in sunny open patches. Old-

er cemeteries can be particularly good places because digging deep graves was once possible only in sandy loam, says Danforth, "and it turns out that that's the perfect stuff for ground-nesting bees." But scientists are careful not to over-generalize, as nesting sites can depend on geographic location, species preferences, and even individual choices. Florida bee photographer and gardener Laura Langlois Zurro has found one sweat bee species, *Agapostemon splendens*, nesting in the dark shade of the crook of her oak tree, for example, while another, *Halictus poeyi*, nests at the edges of shady areas.

As part of the GNBees project, Kueneman is experimenting with "bee beds," hoping to eventually share ideas for bee-friendly substrates. In the meantime, we can all help ground-nesting bees—or at least mitigate harm—by avoiding landscape fabric and wood mulch, which blocks ground access and smothers nests-in-progress. Eliminating pesticide use and soil contamination is another obvious step.

Patchy lawns can host large aggregations, so ditching the manicured look is key. "If you're someone who's constantly seeding your grass and watering and constantly mulching, using a lot of weed and feed—those things are going to be really hard for bees," says Harmon-Threatt. But some disturbance can be beneficial, says Danforth, citing a large aggregation of *Melissodes bimaculatus*, a long-horned bee species, in a suburban lawn where mowing maintains bare spots. And though agricultural tilling can harm bees, a bit of garden digging may lessen soil compaction and make bee-friendlier substrates.

In the end, says Harmon-Threatt, any conscientious effort to nurture habitat for bees is better than none: "Is it perfect? Probably not. Is anything we do perfect? Definitely not. ... But that is habitat that was not there before." ■

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Poey's furrow bee (*Halictus poeyi*) brings pollen to a nest camouflaged under a leaf.