



Solitary Bees

Take a leisurely stroll through the local dunes on a warm day between April and September and your eyes will be met with a feast of wildflowers scattered across the sand in low-growing mats. Take a closer look, and you may notice a plethora of insects attending the blooms. Many insects, including beetles, flies, wasps, and bees, visit flowers to gather food in the form of pollen and nectar, and, while foraging, transfer pollen from one flower to another. This process, called pollination, results in fruit/seed production for the plant.

At least 67 percent of flowering plants today depend on insects for pollination. Bees in particular are important pollinators since their life history is closely linked to the flowers they service. Unlike wasps, which are carnivorous, bees rely on flower resources for all of their food, continuously foraging to fulfill both their own nutritional needs and those of their offspring.

If you are like most people, bee conjures up one of two images: the hard-working European honeybee (*Apis mellifera*), or its furry cousin, the bumblebee (*Bombus* spp.). However, most of the 20,000+ bee species in the world are solitary bees. In contrast to social bees, solitary bees have no colony or hive and no stored resources. Instead, nests are the result of short-lived females working alone. During their 3-4 week lifespan, individual females provide 7-12 cells, each of which contains a single egg. These will then develop underground, and emerge the following spring to begin the cycle again.

There are about a dozen solitary bee species commonly found in our local dunes. Most are "generalists", visiting a wide variety of flowers to meet their nutritional needs. However, some species are "oligolectic". Bees of this type are picky about the plants they visit; they specialize in collecting pollen from only a few closely related plants. One of the few oligolectic species in our local dunes is the leaf-cutter bee (*Megachile wheeleri*). This bee feeds exclusively on flowers in the aster family and is abundant in late summer when dune goldenrod blooms abundantly.





In addition to floral resources, solitary bees in this system are also dependent on the dunes for nest sites and materials. In the early spring, you may notice silver bees (*Emphoropsis miserabilis*) swarming over the sand and among the beach pea flowers. These are males searching for newly emerged females to mate with. The females, once mated, will dig nests up to a meter in depth in the open sand in which to lay their eggs.

Other solitary bees nest in the cryptogamic mats (mossy crust) of the foredune and utilize specific plant materials to line their shallow nests. For example, a "wool-carder" bee (*Anthidium palliventris*), gathers plant hairs from beach buckwheat to line its nests. Check out the leaves of this plant beginning in April and you may notice bare spots where the "wool" has been removed, a sign that this bee is nesting nearby. The leaf-cutter bee also nests in the cryptogamic mat, but this bee uses leaf pieces cut from dune goldenrod to line its nests. Look for clumps of goldenrod with "missing" leaf pieces in late summer and you're likely to find this bee foraging on neighboring plants.

Ceratina acantha is a bee that's easy to miss since it is quite un-bee-like in appearance: tiny (5-9mm), black, and hairless. This "carpenter" bee hollows out old dune goldenrod stems to use as nest sites. If you are lucky enough to spot an active nest, you will most likely see a tiny black face peering up at you from inside the hollow stem.

Aside from the important service they provide as pollinators, bees are fascinating creatures. The next time you're out enjoying the floral display in the dunes, remember to keep an eye out for our local bees and give them a nod of "thanks" for the part they play in maintaining floral diversity.

