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Building Hotels for Solitary Bees

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N orth America, including the mainland U.S., is home to over 4,000 species of native bees. In contrast, only approximately 70 species (all belonging to the genus *Hylaeus*) are native to Hawai'i. There are an additional 19 bee species in the islands introduced from Asia, Australia, Europe, and North America, including honey bees. While our native *Hylaeus* are very important pollinators of native and endemic Hawaiian plants, they are rarely encountered in agricultural areas or home gardens. Thus, when we talk about conserving bees in Hawaiian home gardens and farmlands, we are referring to habitat construction for some of the introduced bees that play an important role in pollination of crops as well as some native plants.

Unlike honey bees, which work together to construct hives of beeswax comb, nearly all of Hawai'i's introduced bees are solitary. Female solitary bees build nests by themselves, using materials collected from the environment such as leaves, flower petals, mud, and plant resins. They make their nests inside of hollow tunnels, such as pithy stems or holes bored by beetles. Within the nest tube, the female creates a single "cell" of leaves, mud, or plant resin, provisions it with enough pollen to support a single offspring, and then lays an egg. She repeats this process until she has filled the nest tube, at which point she seals the opening. Once the offspring have completed development and become adults, they chew their way out.

Bee hotels are artificial nesting sites that can allow observation of these gentle solitary bees in action. Because these bees forage close to their nests, providing nesting structures in your home garden will encourage nesting and pollination year after year!



Leafcutter bee life cycle



Drill holes in wooden blocks or logs to create solitary bee habitat.

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Be creative with stem bundle designs. These are great projects for keiki!

Bee hotels come in many shapes and sizes. **Wooden nest blocks** are constructed from preservative-free lumber, firewood, or fallen logs—these simulate the beetle holes encountered in the bees' native range. Drill holes 3–6 inches deep, ³/₄ inches apart, and between 3/32 inch (2.5 mm) and 3/8 inch (10 mm) in diameter. Female bees control the sex of their offspring, with eggs laid closer to the entrance hatching males. Deeper holes encourage more female offspring, which are the ones that pollinate your garden!

Stem bundles of bamboo of various diameters can also serve as habitat. Cut them at the nodes, such that one end is closed and the other open. Nests should be hung or mounted securely facing east in protected areas with afternoon shade.

Extravagant **5-star bee resorts** may be used as focal structures in home and community gardens. These can incorporate broken and upcycled garden supplies. Because solitary bees actually nest communally, many





species may be observed nesting within a single structure! Growing turf or other plants as a green roof on top of the structure will aid in aesthetics and prevent overheating of the nest interior.

While solitary bees may thrive in many habitats in their native range, in our state they are mostly found in coastal areas and habitats below 1500 feet. Honey bees will forage at higher and lower elevations.

Likely Visitors to Bee Hotels

Carpenter bees (Apidae: Xylocopini)

(A) *Ceratina arizonensis*. Native to North America. **Islands:** Hawai'i, O'ahu

(B) *Ceratina dentipes*. Native to Australia. **Islands:** Hawai'i, Kaua'i, Lāna'i, Maui, Moloka'i, O'ahu

(C) *Ceratina smaragdula*. Native to SE Asia. **Islands:** Hawaiʻi, Oʻahu

(D, E) *Xylocopa sonorina*. Native to North America. **Islands:** Hawai'i, Kaua'i, Lāna'i, Maui, Moloka'i, Ni'ihau, O'ahu

(D) female(E) male

Sweat bees (Halictidae)

(A) *Lasioglossum imbrex*. Native to North America. **Islands:** Hawai'i, Moloka'i, O'ahu

(B) *Lasioglossum impavidum*. Native to North America. **Islands:** Hawaiʻi, Kauaʻi, Lānaʻi, Maui, Oʻahu

(C) *Lasioglossum microlepoides*. Native to North America. **Islands:** O'ahu



Cellophane bees, Yellow-faced bees (Colletidae)

(A) *Hylaeus albonitens*. Native to Australia. **Islands:** Hawai'i, Kaua'i, Moloka'i, O'ahu

(B) *Hylaeus leptocephalus*. Native to Europe. **Islands:** Oʻahu

(C) *Hylaeus strenuus*. Native to India. **Islands:** Kaua'i, O'ahu











Leafcutter bees (Megachilidae)

(A) *Lithurgus scabrosus*. Native to SE Asia. **Islands:** Kaua'i, O'ahu

(B) *Megachile chlorura*. Native to Philippines. **Islands:** Oʻahu

(C) *Megachile diligens*. Native to Pacific Islands. **Islands:** Hawaiʻi, Kauaʻi, Molokaʻi, Oʻahu

(D) *Megachile fullawayi*. Native to Guam. **Islands:** Ni'ihau, Oʻahu

(E) *Megachile gentilis*. Native to North America. **Islands:** Kaua'i, Maui, Moloka'i, O'ahu

(F) *Megachile lanata*. Native to India. **Islands:** Maui, Oʻahu

(G) *Megachile timberlakei*. Native to Pacific Islands. **Islands:** Hawai'i, Kaua'i, Lāna'i, Maui, O'ahu

(H) *Megachile umbripennis* (male). Native to Asia. Lines nests with tree resins mixed with chewed leaves. **Islands:** Hawai'i, Kaua'i, Maui, Moloka'i, O'ahu.



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