

Blackburn's Sphinx Moth image

Terrestrial Invertebrates

Blackburn's Sphinx Moth

Manduca blackburni

SPECIES STATUS:

Federally Listed as Endangered

State Listed as Endangered

State recognized as indigenous

SPECIES INFORMATION: One of Hawaii's largest native insects, the moth's diet consists of low-density, low-apparency host plants such as vines and sapling trees. Examples include larvae feeding on plants in the nightshade family and native trees within the genus *Nothocestrum*. However, the moth has also been known to subsist off of non-native host plants such as commercial and tree tobacco, eggplant, tomato, and Jimson weed. Adults feed on the nectar of such plants as the native Hawaiian morning glory species (*Ipomea indica*) and the native Hawaiian species of caper (*Capparis sandwichiana*). It is believed that the moth is a pollinator for these plants.

DISTRIBUTION: Believed to be extinct in the late 1970s, since 1984 small populations were rediscovered on the islands of Maui, Hawai'i, and Ka-ho'olawe. Historically thought to have occurred on the islands of Kaua'i, Ka-ho'olawe, O'ahu, Moloka'i, Maui, and Hawai'i from sea level to 5,000 feet. Currently, the largest populations reside on Maui and Hawai'i.

Map of Blackburn's Sphinx Moth distribution

ABUNDANCE: Due to its short-lived nature, extremely mobile abilities, and rarity, population abundance is unknown at this time. However populations are believed to have declined over the past 100 years.

LOCATION AND CONDITION OF KEY HABITAT: Historically thought to have occupied dry and mesic shrub land and forest, of which today only 18% exist (for dry forest, less than 10% remains today). Depending on the location and elevation, plant species composition of habitat for the moth varies considerably. However some common native plants where moths occur are lama, 'ohe, hao, 'ala'a, aulu (and its varieties) trees and 'a'ali'i, naio shrubs and wiliwili. The populations on Maui and Hawai'i are associated most with native trees in the genus *Nothocestrum* (*aiea*). One such stand of trees (believed to be the largest in the state), is located in the Kanaio Natural Area Reserve with other stands located on Kaua'i, O'ahu, Moloka'i, La-na'i, Hawai'i, and Maui. On Moloka'i, moth habitat consists of mixed-species in mesic and dry forests with both native and non-native plants. On Ka-ho'olawe, the larvae currently subsist on the non-native plant *Nicotiana glauca* (this plant is also utilized by populations on Maui and the island of Hawai'i).

THREATS: Historically, habitat loss (due to ranching, introduced plants and animals, development, and wildfire) and mortality from non-native predators and parasitoids (which kill eggs, larvae, and caterpillars). Current range is not wholly protected, but critical habitat areas were designated by the federal government on islands of Hawai'i, Maui, Moloka'i, and Ka-ho'olawe. Habitat loss/degradation and fragmentation continues to pose a threat. Current threats include predation by ants and parasitic wasps and decline of its native larval host plants as a result of feral ungulates. Of particular concern is the island of Hawai'i where the larval host plant, *Nothocestrum breviflorum*, is federally listed as endangered and faces threats from development, competition from non-native species, browsing by cattle, fire, and reduced reproductive potential due to its small population. An additional threat, due to its striking appearance, is over-collection for personal collection trade purposes as well as vulnerability, due to its small population, to seasonal variations and weather fluctuation which can affect habitat and availability of food.

CONSERVATION ACTIONS: The goals of conservation actions are to not only protect current populations, but to also establish further populations to reduce the risk of extinction. Past actions have included establishing critical habitat designations at seven sites on the islands of Hawai'i, Ka-ho'olawe, Maui, and Moloka'i with 13 management units also identified. In addition to common state-wide and island conservation actions, specific actions include:

- Restoration of habitat (e.g. dry and mesic shrub land and forests) and increase protection of current known habitats (particularly where *Nothocestrum* exist);
- Support cultivation and restoration of *Nothocestrum* species which are critical for larvae stages;
- Restore *Nothocestrum* on the island of Ka-ho'olawe to support long-range moth populations;
- Reestablish populations in historic ranges;
- Prevent introduction of non-native invertebrates that may pose a risk to existing moth populations.

MONITORING:

- Continue surveys of population and distribution in known and likely habitats, particularly critical habitat areas;
- Continue monitoring of *Nothoestrum* species;
- Monitor non-native plant and animal populations in known as well as potential moth ranges.

RESEARCH PRIORITIES:

- Improve understanding of habitat needs and requirements;
- Gain a better understanding of population status and life history.

References:

U.S. Fish and Wildlife Service. 2003. Draft Recovery Plan for the Blackburn's Sphinx Moth (*Manduca blackburni*). Portland, OR. ix+113 pp.