



Photo: Jim Denny; *Udara Blackburn*; Blackburn's Blue

## Terrestrial Invertebrates

### Moths and Butterflies

Order Lepidoptera

**ORDER INCLUDES:**

Blackburn's Sphinx Moth -  
Federally listed as Endangered  
State listed as Endangered  
18 Native Families  
60 Native Genera  
957 Native Species  
600+ Endemic Species

**GENERAL INFORMATION:** The beauty and popularity of many species of butterflies and moths makes Lepidoptera perhaps the best known insect order. Hawai'i supports 955 native species of moths, but only two native butterfly species: Blackburn's blue (*Udara blackburni*; Lycaenidae), and Kamehameha butterfly (*Vanessa tameamea*; Nymphalidae), the latter is Hawaii's state insect. This disparity in numbers is likely the result of the fact that moths are typically generalists, while most butterflies are dependent on specific host plants. Native moths are very small, with most only having a wingspan of one centimeter (.39 inches) or less, and most are poorly known. Approximately 350 species of native moths are in the genus *Hyposmocoma*, and twice as many are likely undescribed. The species comprising *Hyposmocoma* are the second most diverse animal genus in Hawai'i (flies in the genus *Drosophila* being the most diverse). These moths inhabit a wide range of habitats, although some species are restricted to single stream or river drainages. As a genus they are mostly herbivorous, feeding on plant debris and lichens. In 2005, however, a new species (*H. molluscivora*) was discovered on Maui, the larva of which feeds on snails. Less than one percent of the world's known moths and butterflies are carnivorous.

**DISTRIBUTION:** Lepidopterans are known from all the MHI and the NWHI.

**ABUNDANCE:** As a group unknown. A lack of systematic surveys prevents accurate population estimates. However, the loss of native habitats likely means that species within the order are declining.

**LOCATION AND CONDITION OF KEY HABITAT:** Butterflies and moths occur in all native habitats from sea level to alpine deserts. Host material is widely varied and includes native plants, lichens, algae, and fungi. Some species feed only in the decaying wood of particular plant species.

**THREATS:**

- Habitat loss and degradation due to conversion for agriculture, logging, grazing, and soil disturbance by a suite of non-native ungulates, and the introduction of invasive plants.
- Loss of native host plants.

- Insufficient information, especially for rare species, hampers conservation efforts.
- Non-native species, including ants (Formicidae), especially the big-headed ant (*Linepithema humile*), and several species of parasitic flies (Diptera) and wasps (Hymenoptera) prey on both larvae and adult moths.

**CONSERVATION ACTIONS:** The goals of conservation actions are not only to protect current populations and key breeding habitats, but also to establish additional populations, thereby reducing the risk of extinction. In addition to common statewide and island conservation actions, specific management directed toward moths and butterflies should include:

- Improve commercial shipment inspections to prevent further introduction of alien invertebrates harmful to native species.
- Initiate studies on life history, distribution, and critical habitats to better direct conservation measures.
- Conduct surveys to determine the distribution and abundance of known moths and butterflies and to document and identify new species.
- Preserve, maintain, and restore habitats supporting existing populations.

**MONITORING:**

- Support and expand existing monitoring efforts.
- Establish new monitoring for priority species that are not currently monitored.

**RESEARCH PRIORITIES:**

- Initiate targeted searches for species not recently collected or observed.
- Initiate studies to determine species' distributions to locate areas supporting large numbers of native species.
- Initiate efforts to locate and identify new species.
- Systematic review of the order.

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