

Terrestrial Invertebrates



Drosophila primaeva, externally identical sister species of *D. sharpi*. Photo: Karl Magnacca.

Sharp's *Drosophila*

Drosophila sharpi

SPECIES STATUS:

Federally Listed as Endangered

State Listed as Endangered

State Recognized as Endemic

GENERAL INFORMATION: *Drosophila sharpi* Hardy, 1965 is a basal member of the Hawaiian *Drosophila*. It and its sympatric sister species *D. primaeva* represent an ancient lineage that was one of the first to branch off during the evolution of the group, and has few or no other living relatives. Although not a member of the picture wing clade, it is often treated with them due to its similar size and habits. It is a large, brown fly with only a few inconspicuous wing marks and generally lacking in ornamentation except for a sclerotized black rim on the labellum of the male, which is also found in the fungus-feeding *haleakalae* group. Morphologically it can be separated from *D. primaeva* only by details of the genitalia, but they are significantly different in chromosomal banding pattern. It is endemic to Kaua'i, occurring in mesic to wet forest.

DISTRIBUTION: *Drosophila sharpi* was historically known from two sites, Mt. Kāhili in the south and Kōke'e in the northwest. The last record from Kōke'e is from 1991, but due to close similarity to the more common *D. primaeva* it is possible that some individuals have been sighted since then but not collected. The first and last record from Kāhili was in 1968, but access is limited and few surveys have been conducted there recently.

ABUNDANCE: Unknown. The lack of any recent records means it is possible the species is extinct. However, several other *Drosophila* species have been rediscovered after much longer absences. Even at heavily sampled sites, they may persist at low levels that are not detectable with standard survey methods. Given that the most recent record was less than 25 years ago, it is presumed to be still extant.

LOCATION AND CONDITION OF KEY HABITAT: The breeding host of *Drosophila sharpi* is unknown. Its sister species *D. primaeva* breeds in decaying bark of Araliaceae, *Cheirodendron* spp. and *Polyscias* (= *Tetraplasandra*) spp., and given their close similarity it is likely that *D. sharpi* does as well. *Cheirodendron* is abundant and reproducing at all sites where *D. sharpi* is found, suggesting that unlike other rare *Drosophila*, its numbers may not be strictly host-limited at the sites where it occurs.

THREATS:

- Habitat loss and degradation due to invasive plants and disturbance by non-native ungulates.
- Non-native predators, including ants and wasps (*Vespula pensylvanica*).
- Insufficient information hampers conservation efforts.

CONSERVATION ACTIONS: Conservation of *Drosophila* requires 1) knowledge of the current sites occupied by the species; 2) conservation of a steady supply of breeding hosts at multiple sites; and 3) mitigation of ongoing threats, such as habitat destruction by feral ungulates and the presence of destructive alien arthropod predators. A general understanding of life history and habitat requirements is a prerequisite for management actions, though not for determining endangered status. The goals of conservation actions are not only to protect current populations and key breeding habitats, but also to establish additional populations and maintain sustainable populations of host plants, thereby reducing the risk of extinction. For *Drosophila sharpi* specifically, management needs include:

- Continue and expand fencing to protect habitat from ungulate disturbance.
- Conduct studies on life history and essential habitats to better direct conservation measures, including determining habitat requirements such as microclimate.

MONITORING:

- Continue surveys to identify populations in order to assess their stability and trends.

RESEARCH PRIORITIES:

- Survey for extant populations, in both historic and novel sites.
- Determine major threats and limiting factors.

References:

Kaneshiro, KY, Kaneshiro, K. 1995. Draft listing proposal for 18 species of Hawaiian picture-wing *Drosophila*. Document submitted to the Pacific Islands Office, U.S. Fish and Wildlife Service, Honolulu, Hawai'i.

Montgomery, SL 1975. Comparative breeding site ecology and the adaptive radiation of picture-winged *Drosophila* (Diptera: Drosophilidae) in Hawai'i. Proceedings of the Hawaiian Entomological Society 22(1):65-103.

U.S. Fish and Wildlife Service. 2010. Endangered and threatened wildlife and plants; determination of endangered status for 48 species on Kauai and designation of critical habitat. Federal Register 75:18960-19008.