



Terrestrial Invertebrates

Picture wing *Drosophila* *Drosophila differens*

SPECIES STATUS:
Federally Listed as Endangered
State Listed as Endangered
Designation of Critical Habitat for 12 Species of
Picture-Wing Flies: Final Rule – USFWS 2008

GENERAL INFORMATION: *Drosophila differens* Hardy & Kaneshiro, 1975 is a member of the *planitibia* species group, which includes the largest, most charismatic, and most beautiful species of native pomace flies. This group is distinctive due to the extra crossvein in the wings of all species except the Kaua‘i representatives. Within the group, *D. differens* closely resembles the other species of the *planitibia* subgroup, *D. planitibia* of Maui, and *D. heteroneura* and *D. silvestris* of Hawai‘i. It differs from *D. planitibia* only in having the face yellow rather than black, but laboratory experiments have shown that hybrid male offspring are sterile. The species is endemic to Moloka‘i, occurring in montane wet forest. Like other members of the *planitibia* subgroup, it breeds in rotting bark of lobeliads.

DISTRIBUTION: *Drosophila differens* was historically known from several upper elevation sites on Moloka‘i, all within the Nature Conservancy’s current Kamakou Preserve. Its true range is probably greater, but much of the area to the east is extremely difficult to access. There have been only two collections since 1977, one in 1983 and one in 1999. Surveys in 2005, 2007, and 2010 failed to recover it. However, it was rediscovered in Pu‘u ‘Ali‘i Natural Area Reserve in 2024.

ABUNDANCE: Unknown. The lack of recent records at historic sites suggests it has strongly declined. Native host plant lobeliads now occur at low abundance in these areas and other sites where *D. differens* was recently rediscovered. Other sites near the summit of Kamakou Peak where lobeliads are more common have not been surveyed.

LOCATION AND CONDITION OF KEY HABITAT: All picture wing *Drosophila* live in rotting bark or sap fluxes of native trees as larvae and are generally host-specific. *Drosophila differens* is reported to breed in *Clermontia*, which continues to occur in the area it had been found, though it is relatively uncommon. *Cyanea* and *Trematolobelia* (also lobeliads) occur in the area, *Trematolobelia* is even abundant in some places. It is likely that these two genera of plants also serve as hosts for *D. differens*.

THREATS:

- Habitat loss and degradation due to invasive plants and rats, disturbance by non-native ungulates.
- Non-native predators, including 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 differens* specifically, management needs include:

- Conduct surveys to determine distribution and abundance.
- Continue and expand fencing to protect habitat from ungulate disturbance.
- Conduct studies on life history and essential habitats to better direct conservation measures.

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.
- Conduct studies to document the biology, habitat requirements, and life history.

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, Hawaii.

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

U.S. Fish and Wildlife Service. 2006. Endangered and threatened wildlife and plants; determination of status for 12 species of picture-wing flies from the Hawaiian Islands. *Federal Register* 71: 26835–26852.

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