

Terrestrial Invertebrates

Picture wing *Drosophila*

Drosophila hemipeza



Drosophila hemipeza. Photo: Karl Magnacca.

SPECIES STATUS:

Federally Listed as Endangered

State Listed as Endangered

State Recognized as Endemic

Designation of Critical Habitat for 12 Species of Picture-Wing Flies: Final Rule – USFWS 2008

GENERAL INFORMATION: *Drosophila hemipeza* (Hardy, 1965) is a member of the *planitibia* species group, which includes the largest, most charismatic, and beautiful of the native pomace flies. This group is distinctive for having an extra crossvein in the wing in all except the Kaua'i representatives. The unusual wing pattern is similar to the related *D. substenoptera* and the unrelated *D. pilipa*, but is otherwise distinctive. It can be distinguished from the partially sympatric *D. substenoptera* (which is also endangered) by having the two crossveins nearly in line rather than widely staggered, with the marks over them creating a single dark band across the wing. Both species have an unusual habit of both sexes frequently walking with the wings spread and facing forward, even when not displaying to another fly, possibly making them more vulnerable to predators. The species is endemic to O'ahu, occurring from diverse mesic forest to wet forest. It was historically found widely throughout both mountain ranges of the island, but its range has dramatically contracted. Like other members of the *planitibia* subgroup, it breeds in rotting bark of lobeliads, including *Cyanea* and *Lobelia*, but has also been reared from *Urera kaalae* (ōpuhe), an unusual host for this group.

DISTRIBUTION: *Drosophila hemipeza* was historically known from both the Ko'olau and Wai'anae ranges of O'ahu, primarily the latter. However, the only two Ko'olau sites are at the opposite ends of the island (Pūpūkea and Pauoa Flats), suggesting it had a wide distribution there. In the Wai'anae it was found widely, from Makaleha Valley, Makaha Valley, 'Ēkahanui, Kalua'ā Gulch, and several sites in the vicinity of Pu'u Palikea. Always uncommon, the great majority of records are from Palikea, where it can still be regularly found. The only other known site today is Pu'u Hāpapa, above Kalua'ā Gulch, where it is very rare.

ABUNDANCE: Unknown. During two years of ongoing monthly monitoring from 2013–2014, the O'ahu Army Natural Resources Program (OANRP) found a low but relatively consistent population of this species at Palikea, and only rare individual observations at Hāpapa (OANRP, 2014). While this indicates at least one stable population, it is probably also small enough to be vulnerable to stochastic events such as droughts.

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 hemipeza* is reported to breed in *Cyanea*, *Lobelia*, and *Urera*, which all occur at both present sites. Since there is only one rearing record from each plant, it is unknown whether there is a preferred host; however, if there is it is likely to be for the lobeliads, which related species use

exclusively. Both Palikea and Hāpapa are fenced to exclude feral ungulates and intensively managed for rare plants and snails, and habitat is generally improving at both sites.

THREATS:

- Habitat loss and degradation due to invasive plants and invertebrates, disturbance by non-native ungulates, and fire from nearby agriculture, residential, and military activity.
- 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 hemipeza* 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 the primary host plant and other habitat requirements.
- Establish laboratory breeding colonies for reintroduction to sites where the species has been extirpated.

MONITORING:

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

RESEARCH PRIORITIES:

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

References:

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