

Terrestrial Invertebrates

Picture wing *Drosophila*

Drosophila obatai



Drosophila obatai. 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 obatai* Hardy & Kaneshiro, 1972 is a member of the *orphnopeza* species subgroup, the largest within the *grimshawi* group. It is readily distinguished from most other species by the dusty gray appearance of the body and the small size of the wing spots, characters it shares with the related *D. sodomae* of Maui Nui. *Drosophila obatai* is endemic to O‘ahu, occurring in diverse mesic forest where it breeds in *Chrysodracon* spp. (halapēpē).

DISTRIBUTION: *Drosophila obatai* was historically known mainly from the Wai‘anae range of O‘ahu, where it was collected once from Makaleha Valley and twice from a site near Pu‘u Pane, east of Ka‘ala in 1970–71. There are also two records from that period from the southeastern Ko‘olau range (Wailupe and Wai‘alae Nui), but it has not been adequately surveyed for there. It was rediscovered at Manuwai Gulch in 2011, and has since been found at East Makaleha, near Pu‘u Pane, and two sites in Pule‘ē Gulch in Schofield Barracks.

ABUNDANCE: Unknown. This species is still found in nearly its full historic range as well as some additional sites, though the Ko‘olau sites have not been surveyed. However, repeated surveys from 2013–2014 by the O‘ahu Army Natural Resources Program (OANRP) have found that it is present regularly and in moderate numbers only at Manuwai; at all other sites it is rarely seen, and then only as single individuals. These observations, and the restricted distribution of *Chrysodracon*, suggest that it is primarily limited by the abundance of host plants.

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 obatai* is reported to breed in *Chrysodracon* (=Pleomele). The species was not recorded in fly rearing records, but it is known to breed in at least *C. halapepe* since it occurs at sites where only that species is present. *Chrysodracon forbesii* is presumed to be a host as well, since it is extremely similar and the two species grade into each other morphologically, but *D. obatai* has not been definitively associated with it. Both species widespread, long-lived, and resilient, but suffer from low recruitment and few young plants are seen outside of heavily managed areas. They typically occur as relictual patches of one to five trees, often separated from other patches by mostly non-native vegetation. Because broken branches root easily, many apparent individuals in a patch may actually be clones. Manuwai and Pule‘ē are fenced to exclude feral ungulates and Manuwai is managed for rare plants, and habitat is generally improving at both sites. Other sites continue to degrade due to the presence of feral pigs and goats.

THREATS:

- Habitat loss and degradation due to invasive plants and rats, 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 obatai* specifically, management needs include:

- Continue and expand fencing to protect habitat from ungulate disturbance.
- Continue rat control to allow reproduction of *Chrysodracon*.
- Outplant *Chrysodracon* in protected areas to increase available breeding habitat, with the goal of creating self-sustaining populations of plants.
- 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, particularly limits on *Chrysodracon* reproduction.

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.
- Oahu Army Natural Resources Program. 2014. Status Report for the Makua and Oahu Implementation Plans. Pacific Cooperative Studies Unit, Honolulu, Hawai'i.
- 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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