

5-YEAR REVIEW

Short Form Summary

Species Reviewed: Picture-wing Fly

(*Drosophila aglaia*)

Current Classification: Endangered

Federal Register Notice announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2017. Endangered and threatened wildlife and plants; initiation of 5-year status reviews of 138 species in Hawai‘i, Oregon, Washington, and California. Federal Register 82 (75): 18665–18668.

Lead Region/Field Office:

Region 1/Pacific Islands Fish and Wildlife Office (PIFWO), Honolulu, Hawai‘i

Name of Reviewer(s):

Charmian Dang, Fish and Wildlife Biologist, O‘ahu, Kaua‘i, North Western Hawaiian Islands, and American Samoa Island Geographic Team, PIFWO

Megan Laut, Animal Recovery Coordinator, Conservation & Restoration Programmatic Team, PIFWO

Gregory Koob, Conservation & Restoration Team Manager, Conservation & Restoration Programmatic Team, PIFWO

Methodology used to complete this 5-year review:

This review was conducted by staff of the Pacific Islands Fish and Wildlife Office (PIFWO) of the U.S. Fish and Wildlife Service (Service). The review was based on a review of current, available information since the last 5-year review for *Drosophila aglaia* (USFWS 2012). The evaluation by the Wildlife Biologist was reviewed by the Animal Recovery Coordinator and Conservation and Restoration Team Manager.

Background:

For information regarding the species listing history and other facts, please refer to the U.S. Fish and Wildlife Service’s Environmental Conservation On-line System (ECOS) database for threatened and endangered species (http://ecos.fws.gov/tess_public).

Review Analysis:

Please refer to the previous 5-year review for *Drosophila aglaia* published on August 28, 2012 (available at https://ecos.fws.gov/docs/five_year_review/doc4103.pdf), for a complete review of the species’ status, threats, and management efforts. No significant information regarding the species’ biological status has come to light since listing to warrant a change in the Federal listing status of *D. aglaia*.

This picture-wing fly is an endangered endemic species found only on the island of O‘ahu. The current status and trends for *Drosophila aglaia* are provided in the tables below.

New status information:

No new status information.

New Threats:

Climate change

- Climate change may pose a threat to the larval host plant of this species. Fortini *et al.* (2013) conducted a landscape-based assessment of climate change vulnerability for native plants of Hawai‘i using high resolution climate change projections. Climate change vulnerability is defined as the relative inability of a species to display the possible responses necessary for persistence under climate change. The assessment by Fortini *et al.* (2013) was conducted for *Urera glabra* (family Urticaceae) and concluded that this larval host species is vulnerable to the impacts of climate change, with vulnerability scores of 0.0378 (on a scale of 0 being not vulnerable to 1 being extremely vulnerable to climate change). Therefore, additional management actions are needed to conserve this picture-wing fly larval host species.

New management actions:

No new management actions.

Synthesis:

Since the 5-year review in 2012, no new information on the status of *Drosophila aglaia* has been collected. A total of 20 individuals have been observed during bait-based surveys conducted since April 1969 in the historical range of *Drosophila aglaia* (Kaneshiro, 2005, *in litt.*; Magnacca, 2012a, *in litt.*; OANRP 2007). The historical sites include: three lowland mesic forest sites in Makaleha Valley, Palikea, and Peacock Flat (Kapuahikahi); one site in the diverse mesic forest at Pu‘u Kaua; one lowland, dry to mesic forest site at Pu‘u Pane (Kaneshiro, 2005, *in litt.*); and Ka‘ala, where *D. aglaia* was first collected by Hardy in 1946.

The last observation of this species occurred in May 1997 during a survey of Palikea. The species has not been observed at the other historical sites since 1970 or 1971. However, Makaleha Valley and Peacock Flats (Kapuahikahi Gulch) have not been surveyed since the 1970s and the Pu‘u Pane has been surveyed only once in 1991 (Kaneshiro, 2005, *in litt.*). *Drosophila aglaia* flies have not been observed in subsequent surveys conducted at Palikea, Pu‘u Kalena, Kaluaa Gulch, and Pu‘u Hāpapa, or along Ka‘ala trail, between 2006 and 2011 (Magnacca, 2012a, *in litt.*). Other listed *Drosophila* species have been observed during these surveys. The rarity in detection of *D. aglaia* and the wide variability in detection of *Drosophila* species in general, complicate estimation of population abundance, structure, and demographic. There has been no reported monitoring or survey efforts since 2011 (Magnacca, 2012a, *in litt.*). Previously identified, ongoing threats, continue to place *D. aglaia* in danger of extinction. New surveys are needed to demonstrate the species is still extant.

Approximately three hundred *Urera glabra* were planted at four locations by OANRP for the active habitat management for *Drosophila montgomeryi* (ANRP 2018). One of these locations is Palikea where *D. aglaia* was last observed in 1997.

A Draft Recovery Outline that included *Drosophila aglaia* was published in August 2006. With no Final Recovery Plan for *D. aglaia*, recovery criteria and goals have not been identified for this species. Threats identified in the Final Listing Rule and Draft Recovery

Outline are not sufficiently managed throughout the range of the species (Table 2). Therefore, *D. aglaia* meets the definition of endangered as it remains in danger of extinction throughout its range.

Recommendations for Future Actions:

- Survey and Inventory—Develop and implement a systematic *Drosophila aglaia* survey and monitoring plan that includes historic habitats and other suitable habitats on O‘ahu.
- Develop and implement a Recovery Plan.
- Habitat and natural process protection, management, and restoration.
 - Protect, manage, and restore *Drosophila aglaia* habitat and *Urera glabra* habitat.
 - Evaluate the need to re-establish or supplement *Urera glabra* and wild picture-wing fly populations within their historical range.
- Evaluate *Urera glabra* population and enhance age class structure from seedling to senescent phase, if necessary.
- Survey and document predator threats.
- Ungulate monitoring and control.
 - Construct and maintain fenced exclosures to protect all *Drosophila aglaia* life stages and host plant from the negative impacts of feral ungulates.
 - Monitor fenced areas to maintain absence of ungulates.
- Fire, predation, herbivore, and disease monitoring and control—Implement effective control methods for fire, rat, nonnative insect, predator, and ungulate threats, and habitat altering plant disease within the vicinity of *Drosophila aglaia* and its host plant populations.
- Climate change adaptation strategy—Research the suitability of habitat for reintroducing this species and its host plant in the future due to the impacts of climate change.
- Stochastic events—build resilience and redundancy—Increase numbers of populations and individuals scattered through the historic range to reduce impacts from low numbers.
- Population biology research.
 - Conduct biological and ecological research on *Drosophila aglaia*.
 - Conduct biological and ecological research on the host plant of *Drosophila aglaia*.
- Captive rearing and reintroduction—Evaluate the need to develop and implement a captive rearing and reintroduction program for *Drosophila aglaia* in its historic ranges.
- Alliance and partnership development—Continue coordination efforts with the military on the development and implementation of their Integrated Natural Resource Management Plans (INRMP). Visit other stake holders for host plant management and invasive plant, insect, and mammal control.
- Outreach and Education – Develop and implement a public information program.

Table 1. Status and trends of *Drosophila aglaia* from listing through current 5-year review.

Date	No. wild individuals	No. released	Downlisting Criteria identified in Recovery Plan	Downlisting Criteria completed?
2006 (Listing)	No recent sightings	0	Not yet established	No
2006 (Draft Recovery Outline)	No recent sightings	0	Not yet established	No
2008 (Critical Habitat)	No recent sightings	0	Not yet established	No
2012 (5-year review)	No recent sightings	0	Not yet established	No
2017 (5-year review)	No recent sightings	0	Not yet established	No

Table 2. Threats to *Drosophila aglaia* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Ungulate degradation of habitat	A	Ongoing	Yes. OANRP's 2009 INRMP included feral ungulate control in areas within and adjacent to the West Range of Schofield Barracks Military Reservation. Hawai'i DLNR-DOFAW is actively managing the Honouliuli Forest Reserve with fence maintenance, construction of ungulate exclosures, and ungulate control (Peralta, 2018, <i>in litt.</i>)
Established ecosystem altering invasive plant species degradation of habitat	A	Ongoing	Yes. OANRP's 2009 INRMP included nonnative plant control in areas within and adjacent to the West Range of Schofield Barracks Military Reservation.
Climate change	A, E	Increasing	No
Rodent predation or herbivory degradation of habitat	C	Ongoing	No. <i>Urera glabra</i> is vulnerable to rat predation and the plants are vulnerable to habitat degradation.
Alien predators—Invertebrates	C	Ongoing	No. <i>Drosophila aglaia</i> face substantial predation pressure from nonnative insects such as yellowjacket wasps and ants.
Lack of adequate biosecurity legislation and regulation	D	Ongoing	Yes. O'ahu has a biosecurity program in place to prevent introduction of invasive species but the program is in its beginning stage.
Alien Competitors	D, E	Ongoing	No. <i>Drosophila aglaia</i> larval stage, possibly faces resource competition from nonnative tipulid flies (crane flies, family Tipulidae) (Science Panel 2005). Existing regulations offer inadequate protection to these species from the introduction of nonnative insects and the loss of their host plants.
Human Disturbance	E	Ongoing	No
Environmental Catastrophes	E	Ongoing	No
Stochastic events—Reduced viability due to low numbers	E	Ongoing	No. Surveys have not been conducted since 2011. <i>Drosophila aglaia</i> has not been documented since 1999. No current population or distribution is known. No <i>D. aglaia</i> are in captive rearing.

References:

See previous 5-year review completed in 2012 for a more complete list of references (USFWS 2012). Only references not included in that document are provided below.

Army Natural Resources Program. 2018. Status report for the Mākua and O‘ahu Implementation Plans. U.S. Army Garrison, Hawai‘i.

Fortini, L., J. Price, J. Jacobi, A. Vorsino, J. Burgett, K. Brinck, F. Amidon, S. Miller, S. Gon II, G. Koob, and E. Paxton. 2013. A landscape-based assessment of climate change vulnerability for all native Hawaiian plants. Technical report HCSU-044. Hawaii Cooperative Studies Unit, University of Hawaii at Hilo, Hawaii. 134 pp.

[USFWS] U.S. Fish and Wildlife Service. 2017. Endangered and threatened wildlife and plants; initiation of 5-year status reviews of 138 species in Hawai‘i, Oregon, Washington, and California. Federal Register 82 (75): 18665–18668.

***In Litt.* Reference:**

Peralta, R. *in litt.* 2018. Email communication between Ryan Peralta, Forest Management Supervisor, Division of Forestry and Wildlife and Charmian Dang, U.S. Fish and Wildlife Service, Honolulu, Hawai‘i on October 26, 2018.

U.S. FISH AND WILDLIFE SERVICE
SIGNATURE PAGE for 5-YEAR REVIEW of
Picture-wing Fly (*Drosophila aglaia*)

Pre-1996 DPS listing still considered a listable entity? N/A

Recommendation resulting from the 5-year review:

- Delisting
- Reclassify from Endangered to Threatened status
- Reclassify from Threatened to Endangered status
- No Change in listing status

for **Field Supervisor, Pacific Islands Fish and Wildlife Office**
