

5-YEAR REVIEW

Short Form Summary

Species Reviewed: Picture-wing Fly

(*Drosophila musaphilia*)

Current Classification: Endangered

Federal Register Notice announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2020. Endangered and threatened wildlife and plants; initiation of 5-year status reviews of 129 species in Oregon, Washington, Idaho, Hawai‘i, Montana, California, and Nevada. Federal Register 85 (48): 14240–14243.

Lead Region/Field Office:

Interior Region 12/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

John Vetter, Animal Recovery Coordinator, Conservation & Restoration Programmatic Team, PIFWO

Megan Laut, 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 musaphilia* (USFWS 2017). 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 reviews for *Drosophila musaphilia* published on September 5, 2017 (https://ecos.fws.gov/docs/tess/species_nonpublish/2404.pdf), and August 28, 2012 (available at https://ecos.fws.gov/docs/tess/species_nonpublish/2404.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. musaphilia*.

This picture-wing fly is an endangered endemic species found only on the island of Kaua‘i. The current status and trends for *Drosophila musaphilia* are provided in Table 1 below. Threats are shown in Table 2.

New status information:
No new status information.

New Threats:
No new threats.

New management actions:
No new management actions.

Synthesis:

Endemic to the island of Kauaʻi, *Drosophila musaphilia* is a picture-wing fly that was last observed in September of 2021 where a single sighting occurred near the NASA dish in Kokee. This survey included the Navy site where this species was observed before but not the adjacent areas, such as Nuʻalolo Trail. Opportunistic surveys occur however, there has been no consistent monitoring or survey effects in recent years.

The Kauaʻi Island Recovery Plan that included *Drosophila musaphilia* was published in August of 2021. Recovery criteria and goals for this picture-wing fly have been identified and consist of 1) protect habitats known to support populations; 2) stabilize populations within their known distributions; and 3) conduct research necessary to redefine recovery criteria. Threats identified in the Final Listing Rule and Kauaʻi Island Recovery Plan are not sufficiently managed throughout the range of the species. Therefore, *D. musaphilia* 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 musaphilia* survey and monitoring plan that includes historic habitats and other suitable habitats on Kauaʻi.
- Implement the Recovery Plan.
- Habitat and natural process protection, management, and restoration.
 - Protect, manage, and restore *Drosophila musaphilia* habitat and host plants habitat.
 - Evaluate the need to reestablish or supplement host plants and wild picture-wing fly populations within their historical range.
- Evaluate host plants 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 musaphilia* life stages and host plants 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*

musaphilia and its host plants populations.

- Climate change adaptation strategy—Research the suitability of habitat for reintroducing this species and its host plants 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 musaphilia*.
 - Conduct biological and ecological research on the host plants of *Drosophila musaphilia*.
- Captive rearing and reintroduction—Evaluate the need to develop and implement a captive rearing and reintroduction program for *Drosophila musaphilia* in its historic ranges.
- Alliance and partnership development—Coordination efforts with stake holders for host plants 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 musaphilia* from listing through current 5-year review.

Date	No. wild individuals	No. released	Downlisting Criteria identified in Recovery Plan	Downlisting Criteria completed?
2006 (listing)	12 (1965-1999) Unknown (2000-2006)	0	Not yet established	No
2008 (critical habitat)	Unknown	0	Not yet established	No
2012 (5-year review)	5 (2009-2010) 0 (2011) Unknown (2012)	0	Not yet established	No
2017 (5-year review)	Unknown	0	Not yet established	No
2021 (Kaua'i Islandwide Recovery Plan)	1 (2021)	0	The species occurs in one or more viable populations (viable is defined in Criterion 2) that represent the ecological, morphological, behavioral, and genetic diversity of the species.	No
			Viability of the population is demonstrated through quantitative surveys which demonstrate that the number of individuals in management subunits and any isolated population has been stable or increasing over a 5 year trend, and demographic monitoring shows that the total population size is not likely to decline by more	No

			than 20 percent within the next 10 years.	
			Sufficient habitat and number of host plants in management subunits are protected and managed to achieve Criteria 1 and 2.	No
			Threats responsible for the decline of the species have been identified and controlled.	No

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

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Ungulate degradation of habitat	A	Ongoing	Partially
Established ecosystem altering invasive plant species degradation of habitat	A	Ongoing	Partially
Hurricane destruction and degradation of habitat	A	Increasing	None
Climate change degradation or loss of habitat	A	Ongoing	None
Ungulate predation or herbivory	C	Ongoing	Partially
Predation	C	Ongoing	None
Inadequacy of existing regulatory mechanisms-Lack of adequate hunting regulations	D	Ongoing	None
Invasive species- Established invasive plant species competition	E	Ongoing	Partially
Fire loss or degradation of habitat	E	Ongoing	None
Stochastic events— Reduced viability due to low numbers	E	Ongoing	None
Loss of mutualists- Pollinators	E	Ongoing	None

References:

See previous 5-year review completed in 2017 for a more complete list of references (USFWS 2017). Only references not included in that document are provided below.

[USFWS] U.S. Fish and Wildlife Service. 2017. *Drosophila musaphilia* (Picture-wing Fly) 5-Year Review Summary and Evaluation. 5 pp.

[USFWS] U.S. Fish and Wildlife Service. 2020. Endangered and threatened wildlife and

plants; initiation of 5-year status reviews of 129 species in Oregon, Washington, Idaho, Hawai'i, Montana, California, and Nevada. Federal Register 85 (48): 14240–14243.

[USFWS] U.S. Fish and Wildlife Service. 2021. Kaua'i Islandwide Recovery Plan. 65 pp.

IN LITT.

Magnacca, K. in litt. 2022. Email communication between Dr. Karl Magnacca, O'ahu Army Natural Resources Program and Charmian Dang, U.S. Fish and Wildlife Service, Honolulu, Hawai'i on February 22, 2022

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

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**
