

5-YEAR REVIEW

Short Form Summary

Species Reviewed: Picture-wing Fly
(*Drosophila substenoptera*)

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 substenoptera* (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 substenoptera* published on August 28, 2012 (available at https://ecos.fws.gov/docs/five_year_review/doc4093.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. substenoptera*.

This picture-wing fly is an endangered endemic species found only on the island of O‘ahu. The current status and trends for *Drosophila substenoptera* 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 plants 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 *Cheirodendron platyphyllum*, *Cheirodendron trigynum*, *Polyscias (=Tetraplasandra) kawaiensis*, and *Polyscias (=Tetraplasandra) oahuensis* (family Araliaceae) and concluded these larval host species are vulnerable to the impacts of climate change, with vulnerability scores of 0.519, 0.126, 0.0414, and 0.0893, respectively (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:

In 2013 the O'ahu Army Natural Resources Program (OANRP) began working on *Drosophila substenoptera*, focusing on surveying for new populations (ANRP 2018).

Synthesis:

On lands managed by the Army there are three known population units (PUs) for *D. substenoptera*: Palikea, Ka'ala-Kalena, and Ōpae'ula. At other PUs *D. substenoptera* is highly sporadic, typically occurring as single individuals observed only once during a day (ANRP 2018).

Between 2013 and mid-2018 a maximum of 19 individuals were observed during bait surveys in one day at Palikea (Magnacca, 2018, *in litt.*). Monthly monitoring in the northern portion of Palikea Mitigation Unit has been ongoing since May 2013 with a total of 57 survey days (ANRP 2018).

Between 2013 and mid-2018 a maximum of 1 individual was observed during bait surveys in one day at lower Ōpae'ula. One individual was observed in 2013 and in 2015 (Magnacca, 2018, *in litt.*). Collection effort has been limited due to the difficulty in accessing areas of intact habitat for this species (ANRP 2018).

Between 2011 and mid-2018 a maximum of 1 individual was observed during bait surveys in one day at Ka'ala. At less visited PUs between 2013 and 2015 a maximum of 1 individual was observed in East Makaleha in 2013; and between 2007 and mid-2018 a maximum of 10 individuals were observed at Schofield Barracks (Magnacca, 2018, *in litt.*).

Active habitat management for *Drosophila substenoptera* by OANRP has occurred with the outplanting of one hundred and twenty two *Cheirodendron trigynum* saplings (ANRP 2017).

A Draft Recovery Outline that included *Drosophila substenoptera* was published in August 2006. With no Final Recovery Plan for *D. substenoptera* 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. substenoptera* 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 substenoptera* 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 substenoptera* habitat and host plants habitat.
 - Evaluate the need to re-establish or supplement host plants and wild picture-wing fly populations within their historical range.
- Evaluate *Cheirodendron platyphyllum*, *Cheirodendron trigynum*, *Polyscias kavaiensis*, and *Polyscias oahuensis* 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 substenoptera* life stages and host plants from the negative impacts of feral ungulates.
 - Monitor fenced areas to maintain absence of ungulates.
- 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.
- 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 substenoptera* and its host plants populations.
- 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 substenoptera*.
 - Conduct biological and ecological research on the host plants of *Drosophila substenoptera*.
- Captive rearing and reintroduction—Evaluate the need to develop and implement a captive rearing and reintroduction program for *Drosophila substenoptera* 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. 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 substenoptera* 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)	16 individuals were sighted during bait surveys	0	Not yet established	No
2017 (5-year review)	Between 2013 to mid-2018 a maximum of 19 individuals were sighted during bait surveys in one day at Palikea; between 2013 to mid-2018 a maximum of 1 individual was observed during bait surveys in one day at lower Ōpae‘ula; between 2011 to mid-2018 a maximum of 1 individual was observed during bait surveys in one day at Ka‘ala; between 2013 and 2015 a maximum of 1 individual was observed in East Makaleha; and between 2007 and mid-2018 a maximum of 10 individuals were observed at Schofield Barracks	0	Not yet established	No

Table 2. Threats to *Drosophila substenoptera* 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 species 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. Host plants are vulnerable to rat predation and the plants are vulnerable to habitat degradation.
Alien predators—Invertebrates	C	Ongoing	No. <i>Drosophila substenoptera</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 substenoptera</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 are currently being conducted on lands managed by the Army. No <i>D. substenoptera</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. 2017. Status report for the Mākua and O'ahu Implementation Plans. U.S. Army Garrison, Hawai'i.

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.* References:**

Magnacca, K. *in litt.* 2018. Army environmental sites collecting report. Submitted by

Karl Magnacca. U.S. Army Garrison, Hawai'i.

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 substenoptera*)

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**

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