

5-YEAR REVIEW

Short Form Summary

Species Reviewed: *Phyllostegia hispida* (no common name)

Current Classification: Endangered

Federal Register Notice announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2021. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status reviews for 77 Species in Oregon, Washington, Idaho, and Hawaii. Federal Register 86(120): 33726–33728, June 25, 2021.

Lead Region/Field Office:

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

Name of Reviewer:

Daniel Adamski, Biologist, PIFWO

Lauren Weisenberger, Plant Recovery Coordinator, Acting Recovery Team Manager, 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) beginning in October 2022. The review was based on a review of current, available information since the last 5-year review for *Phyllostegia hispida* (USFWS 2018). The evaluation by Daniel Adamski, Biologist, was reviewed by Lauren Weisenberger, Plant Recovery Coordinator, and Acting Recovery Team Manager.

Background:

For information regarding the species’ listing history and other facts, please refer to the Fish and Wildlife Service’s Environmental Conservation On-line System (ECOS) database for threatened and endangered species (<http://ecos.fws.gov/ecp/species/423>).

Review Analysis:

Please refer to the previous 5-year reviews for *Phyllostegia hispida* published in the Federal Register on June 2, 2014, (available at https://ecos.fws.gov/docs/tess/species_nonpublish/2200.pdf) and October 23, 2018, (available at https://ecos.fws.gov/docs/tess/species_nonpublish/2526pdf) for a complete review of the species’ status, threats, management efforts, and references cited. We are not aware of any significant new information regarding the species’ biological status since listing to warrant a change in the Federal listing status of *P. hispida*.

This short-lived perennial shrubby vine in the Lamiaceae (mint) family is endangered and is known from the island of Moloka‘i. The status and trends for *Phyllostegia hispida* are provided in the tables below.

New Status Information:

- Currently, there are two populations at Hanalilolilo on Moloka‘i totaling two individuals (Bakutis, pers. comm. 2023). Field biologists have observed this species to be short-lived and future surveys may reveal additional wild individuals (Bakutis, pers. comm. 2023).
- Currently, there are approximately nine founder lines represented in *ex situ* storage and propagation collections, including seeds in seed banks, explants in tissue culture, and plants in a nursery or living collection.

New Threats:

- None

New Management Actions:

- Monitoring and surveys—The Plant Extinction Prevention Program continues to monitor individuals of *Phyllostegia hispida* on Moloka‘i (Bakutis, pers. comm. 2023).
- Collection and propagation for genetic storage and reintroduction—
 - Lyon Arboretum Micropropagation Laboratory reports 1,972 explants in micropropagation representing 9 founders from Kamakau, Pu‘u Ali‘i, and Hanalilolilo on Moloka‘i. The Lyon Seed Conservation Laboratory reports 4,052 seeds in storage from six founder plants at Hanalilolilo, Kawela, and Pu‘u Ali‘i (Lyon Arboretum 2022).
 - National Tropical Botanical Garden reports 4,275 seeds in storage from three founders from Kamakau (NTBG 2022).
 - Olinda Rare Plant Facility (ORPF) reports six founder plants represented in propagation totaling over 2,000 plants (ORPF 2023).

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

Date	No. wild individuals	No. outplanted	Stability Criteria identified in Recovery Plan	Stability Criteria Completed?
2009 (listing)	24	214	All threats managed in all 3 populations	Partially
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2014 (5-year review)	29	7-10	All threats managed in all 3 populations	Partially

			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
Date	No. wild individuals	No. outplanted	*Preventing Extinction Criteria identified by HPPRCC	*Preventing Extinction Criteria Completed?
2018 (5-year review)	<10	1,600-2,000	All threats managed in all 3 populations	No
			Reproduction (i.e., viable seeds, seedlings, saplings) at all X populations	No
			Complete genetic storage	Partially
			3 populations with 50 mature individuals each	No
2023 (5-year review)	2	0	All threats managed in all 3 populations	No
			Complete genetic storage	Yes
			Natural reproduction at all 3 populations	Unknown
			3 populations with 50 mature individuals each	No

* The Preventing Extinction Stage was established in 2011. Prior to 2011, the Interim Stabilization Stage was the first stage towards recovery (now it is the second stage after Preventing Extinction).

Table 2. Threats to *Phyllostegia hispida* and ongoing conservation efforts.

Threat	Listing factor	Current Status	Conservation/ Management Efforts
Degradation and destruction of habitat by feral ungulates	A	Ongoing	Partial, fencing at Hanalilolilo

Established ecosystem altering invasive plant species degradation of habitat	A	Ongoing	Partial
Climate change degradation or loss of habitat, including hurricanes	A	Ongoing	None
Degradation and destruction by landslides	A	Ongoing	None
Predation and herbivory by feral ungulates	C	Ongoing	Partial, fencing at Hanalilolilo
Predation and herbivory by rats	C	Ongoing	None
Predation and herbivory by invertebrates—Slugs, snails, black twig borer	C	Ongoing	None
Reduced viability due to low numbers	E	Ongoing	Partial, propagation and seed storage efforts are ongoing

Synthesis:

Currently there are two wild individuals of *Phyllostegia hispida* on Moloka‘i. Individuals are provided protection by fencing and nonnative plant control. Seed collections and propagation are ongoing.

Stabilizing (interim), downlisting, and delisting objectives are provided in the *Phyllostegia hispida*: Addendum to the Moloka‘i Plant Cluster Recovery Plan (USFWS 2013), and have been updated according to the draft revised recovery objective guidelines developed by the Hawai‘i and Pacific Plants Recovery Coordinating Committee (HPPRCC 2011). The HPPRCC identifies an additional initial objective, the Preventing Extinction Stage, in addition to the Interim Stabilization, Delisting, and Downlisting objectives. Furthermore, life history traits such as breeding system, population size fluctuation or decline, and reproduction type (sexual or vegetative), have been included in the calculation of goals for the number of populations and reproducing individuals for each stage. The goals for each stage remain grouped by life span defined as annual, short-lived perennial (fewer than 10 years), or long-lived perennial.

Phyllostegia hispida is a short-lived perennial shrubby vine. To prevent extinction, which is the first milestone in recovering the species, the taxon must be managed to control threats (e.g., fenced) and have 50 individuals (or the total number of individuals if fewer than 50 exist) from each of three populations represented in *ex situ* (secured off-site, such as a nursery or seed bank) collections that are well managed. In addition, a minimum of a total of three populations should be documented on Moloka‘i where they now occur or occurred historically and each of these populations must be naturally reproducing (i.e.,

viable seeds and seedlings with a minimum of 50 mature, reproducing individuals per population.

The preventing extinction goals for this species have not been met. Although genetic storage is complete (Table 1), there are no single populations totaling at least 50 reproducing individuals, and all threats are not being managed (Table 1, Table 2). Therefore, *Phyllostegia hispida* meets the definition of Endangered as it remains in danger of extinction throughout its range.

Recommendations for Future Actions:

No significant new information regarding the species' biological status has been reported since the last 5-year review in 2018. Thus, the following recommendations for future actions are reiterated for the 5-year review for 2023.

- Surveys and monitoring—Survey for additional populations of *Phyllostegia hispida* at historical populations and areas of potentially suitable habitat.
- Ungulate monitoring and control—Continue to maintain fenced exclosures to protect individuals from the negative impacts of browsing by ungulates.
- Invasive nonnative plant monitoring and control—Continue control of established ecosystem-altering nonnative invasive plant species, and those that compete with *Phyllostegia hispida* within and around all wild populations.
- Climate change adaptation strategy—Research suitability of habitat for viability of species, including where to conduct translocations in the future due to the impacts of climate change, including increasing temperatures, periods between rain events, and frequency and intensity of hurricanes. Additional management actions may be needed, such as locating microsites that overlap with current and future climate envelopes for translocation efforts.
- Predator and herbivore monitoring and control—Determine and implement effective methods for rodents and slugs around wild populations.
- Captive propagation for genetic storage and reintroduction—Continue collection and propagation efforts for maintenance of genetic stock and for future reintroduction.
- Build resiliency, redundancy, and representation — Increase species' viability through habitat restoration, threat control, and reintroduction and translocation. Continue attempts at reintroduction into suitable habitat that is being managed for known threats to this species to reduce impacts of erosion, treefall, flooding, and hurricanes.
- Alliance and partnership development—Continue to work with partners and other land managers in planning and implementation of ecosystem-level restoration and management to benefit this species.

References:

[HPPRCC] Hawai'i and Pacific Plants Recovery Coordinating Committee. 2011. Revised recovery objective guidelines. 8 pp.

Lyon Arboretum. 2022. Report on controlled propagation of listed species, as designated under the U.S. Endangered Species Act. Unpublished report submitted to the U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, Honolulu, Hawai‘i.

[NTBG] National Tropical Botanical Garden. 2022. Report on controlled propagation of listed species, as designated under the U.S. Endangered Species Act. Unpublished report submitted to the U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, Honolulu, Hawai‘i.

[ORPF] Olinda Rare Plant Facility. 2023. Report on controlled propagation of listed species, as designated under the U.S. Endangered Species Act. Unpublished report submitted to the U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, Honolulu, Hawai‘i.

[USFWS] 2013a. U.S. Fish and Wildlife Service. Endangered and threatened wildlife and plants; recovery plan for *Phyllostegia hispida*; addendum to the Moloka‘i plant cluster recovery plan; notice of document availability. Federal Register 78(167):53155-53156.

[USFWS] 2014. *Phyllostegia hispida* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI.
https://ecos.fws.gov/docs/tess/species_nonpublish/2200.pdf.

[USFWS] 2018. *Phyllostegia hispida* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI.
https://ecos.fws.gov/docs/tess/species_nonpublish/2526.pdf.

[USFWS] 2021. Endangered and Threatened wildlife and plants; initiation of 5-year status reviews for 77 Species in Oregon, Washington, Idaho, and Hawaii. Federal Register 86(120): 33726–33728, June 25, 2021.

Personal Communication:

Bakutis, A. 2023. Moloka‘i Coordinator, Plant Extinction Prevention Program, Moloka‘i, Hawai‘i. E-mail to Lauren Weisenberger, U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, dated May 30, 2023. Subject: 5-year review questions for *P. hispida*.

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SIGNATURE PAGE for 5-YEAR REVIEW of *Phyllostegia hispida* (no common name)

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

_____ Date _____