

## 5-YEAR REVIEW

Short Form Summary

**Species Reviewed:** *Phyllostegia mannii* (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 mannii* (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/7511>).

### **Review Analysis:**

Please refer to the previous 5-year reviews for *Phyllostegia mannii* published in the Federal Register on August 2, 2011, (available at [https://ecos.fws.gov/docs/tess/species\\_nonpublish/1735.pdf](https://ecos.fws.gov/docs/tess/species_nonpublish/1735.pdf)) and October 23, 2018, (available at [https://ecos.fws.gov/docs/tess/species\\_nonpublish/2653.pdf](https://ecos.fws.gov/docs/tess/species_nonpublish/2653.pdf)) 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. mannii*.

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

New Status Information:

- Currently, there are no known wild populations of *Phyllostegia mannii* on Maui and Moloka‘i (Plant Extinction Prevention Program (PEPP 2022). One reintroduction population with one individual was planted on Moloka‘i in 2010, and the current status on the population is unknown (Bakutis 2010).
- Currently, there are three founder lines represented in *ex situ* storage and propagation collections, including seeds in seed banks and explants in tissue culture.

New Threats:

- None

New Management Actions:

- Monitoring and surveys—PEPP surveys for individuals of *Phyllostegia mannii* on Moloka‘i while conducting endangered species monitoring (PEPP 2022).
- Collection and propagation for genetic storage and reintroduction—
  - Lyon Arboretum Micropropagation Laboratory reports 323 explants in micropropagation representing two founders from Hanalilolilo on Moloka‘i, and the Lyon Seed Conservation Laboratory reports 466 seeds in storage from one founder from Moloka‘i (Lyon Arboretum 2022).
  - National Tropical Botanical Garden (NTBG) reports approximately 200 seeds in storage from one founder from Kamakou on Moloka‘i (NTBG 2022).
- Reintroduction/ Augmentation/ Introduction— One reintroduction population with one individual was planted on Moloka‘i in 2010, and the current status on the population is unknown (Bakutis 2010).

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

Date	No. wild individuals	No. outplanted	Stability Criteria identified in Recovery Plan	Stability Criteria Completed?
1992 (listing)	4	0	All threats managed in all 3 populations	No
			Complete genetic storage	No
			3 populations with 50 mature individuals each	No
2011 (5-year review)	3	18	All threats managed in all 3 populations	No

			Complete genetic storage	Yes
			3 populations with 50 mature individuals each	No
<b>Date</b>	<b>No. wild individuals</b>	<b>No. outplanted</b>	<b>*Preventing Extinction Criteria identified by HPPRCC</b>	<b>*Preventing Extinction Criteria Completed?</b>
2018 (5-year review)	0	1	All threats managed in all 3 populations	No
			Reproduction (i.e., viable seeds, seedlings, saplings) at all 3 populations	No
			Complete genetic storage	Yes
			3 populations with 50 mature individuals each	No
2023 (5-year review)	0	1	All threats managed in all 3 populations	Partially
			Complete genetic storage	Yes
			Natural reproduction at all 3 populations	No
			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 mannii* and ongoing conservation efforts.**

<b>Threat</b>	<b>Listing factor</b>	<b>Current Status</b>	<b>Conservation/ Management Efforts</b>
<b>Degradation and destruction of habitat by feral ungulates</b>	A	Ongoing	Partial, individual within managed area

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

**Synthesis:**

Currently there are no known wild individuals of *Phyllostegia mannii* on Maui and Moloka‘i. Seed collections, propagation, and outplanting are ongoing.

Stabilizing (interim), downlisting, and delisting objectives are provided in the Recovery Plan for the Moloka‘i Plant Cluster (USFWS 1996), 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 mannii* is a short-lived perennial 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 Maui and 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 known wild individuals of *Phyllostegia mannii* (Table 1). Therefore, *Phyllostegia mannii* 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 mannii* in areas of potentially suitable habitat on Maui and Moloka'i .
- Ungulate monitoring and control—Continue to maintain fenced exclosures and construct new fences 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 mannii* within and around all wild and translocated populations.
- Fire prevention and control—Develop and implement fire prevention management plans and monitor populations after fire occurrence.
- 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 and translocated populations.
- Captive propagation for genetic storage and reintroduction—Continue propagation efforts for maintenance of genetic stock and for reintroduction.
- Build resiliency, redundancy, and representation — Increase species' viability through habitat restoration, threat control, and reintroduction and translocation. Continue 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:**

Bakutis, A. 2010. Hawai'i Rare Plant Restoration Group (HRPRG) Field Data Form in PEPP 2022: Plant Extinction Prevention Program, FY 2022 Annual Report (Oct 1, 2021-Sep 30, 2022), USFWS CFDA Program #15.657, Endangered Species Conservation-Recovery Implementation Funds, Coop Agreement F19AC00532

- (Interim Report), December 29, 2022, UH Mānoa, PCSU, PEPP. 134 pp.  
BioPacifica database record for *Sanicula purpurea*, Pacific Islands Fish and Wildlife Office.
- [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.
- [PEPP] 2022. Plant Extinction Prevention Program fiscal year 2022 interim performance report (October 1, 2021-September 30, 2022), Cooperative Agreement F19AC00532 (Interim report), U.S. Fish and Wildlife Service CFDA Program #15.657 Endangered Species Conservation—Recovery Implementation Funds, University of Hawai‘i at Mānoa, Pacific Cooperative Studies Unit, Plant Extinction Prevention Program. 50 pp.
- [USFWS] U.S. Fish and Wildlife Service. 1996. Recovery plan for the Moloka‘i plant cluster (Hawai‘i). Portland. 143 pp.
- [USFWS] 2011. *Phyllostegia mannii* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI.  
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- [USFWS] 2018. *Phyllostegia mannii* 5-year review summary and evaluation. USFWS Pacific Islands Fish and Wildlife Office, Honolulu, HI.  
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- [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.

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SIGNATURE PAGE for 5-YEAR REVIEW of *Phyllostegia mannii* (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 \_\_\_\_\_